CALAM MONTEREY PENINSULA WATER SUPPLY PROJECT

Final Environmental Impact Report/ Environmental Impact Statement
SCH# 2006101004

Prepared for
California Public Utilities Commission and
Monterey Bay National Marine Sanctuary

March 2018

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

Office of National Marine Sanctuaries
1305 East-West Highway
Silver Spring, Maryland 20910

March 28, 2018

Dear Reviewer:

In accordance with provisions of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), the National Oceanic and Atmospheric Administration (NOAA) and the California Public Utilities Commission (CPUC), as co-Lead Agencies, enclose for your review, the *Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Proposed Monterey Peninsula Water Supply Project.*

California American Water Company (CalAm) submitted a permit application for the construction and operation of its proposed Monterey Peninsula Water Supply Project (MPWSP). The purpose of the MPWSP is to replace existing water supplies for CalAm's Monterey District service area. The MPWSP includes various proposed facilities and improvements including: a subsurface intake system; a 9.6-million-gallons-per-day reverse osmosis desalination plant; desalinated water storage and conveyance facilities; and expanded Aquifer Storage and Recovery facilities. Federal, state, and local agencies will use the Final EIR/EIS to consider related permits or other approvals.

The Final EIR/EIS assesses the potential environmental impacts associated with the proposed project and six alternatives including a No Action Alternative. The Final EIR/EIS identifies Alternative 5a as the environmentally superior/environmentally preferred alternative, assuming implementation of the Pure Water Monterey Groundwater Replenishment Project. Alternative 5a is also the NOAA-preferred alternative.

NOAA and the CPUC are not required to respond to comments received as a result of issuance of the Final EIR/EIS. However, comments received will be reviewed and considered for their impact on the issuance of a Certificate of Public Convenience and Necessity (CPCN) or a Record of Decision (ROD) described in Section 1.5.4. Please send comments to the decision makers below. The ROD will be made publically available after a final agency action.

Responsible Officials:

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Sincerely,

John Armor
Director

Enclosure

TABLE OF CONTENTS

CalAm Monterey Peninsula Water Supply Project Final Environmental Impact Report / Environmental Impact Statement

Page

Volume 1 (continued)

Page

Volume 1 (continued)

Page

Volume 1 (continued)

Page

Volume 1 (continued)

Page

Volume 1 (continued)

4. Environmental Setting (Affected Environment), Impacts, and Mitigation Measures (continued)

Page

Volume 1 (continued)

Page

Volume 1 (continued)

Page

Volume 1 (continued)

Volume 2

Page

Volume 2 (continued)

8. Draft EIR/EIS Comments and Responses (continued)

Page

Volume 3 (continued)

8. Draft EIR/EIS Comments and Responses (continued)

Volumes 4 & 5

Page

Volumes 4 & 5 (continued)

8. Draft EIR/EIS Comments and Responses (continued)

Non-Governmental Organization Comment Letters (continued)

Page

Volumes 4 & 5 (continued)

Volume 6

Page

Volume 6 (continued)

8. Draft EIR/EIS Comments and Responses (continued)

Page

Appendices

Page

List of Figures

List of Figures (continued)

Page

List of Figures (continued)

Page

List of Figures (continued)

List of Tables

Page

List of Tables (continued)

Page

List of Tables (continued)

List of Tables (continued)

List of Tables (continued)

Page

List of Tables (continued)

List of Tables (continued)

LIST OF ACRONYMS

AF	Acre feet
afy	Acre-feet per year
ALJ	Administrative Law Judge
AMBAG	Association of Monterey Bay Area Governments
amsl	Above mean sea level
ASBS	Area of Special Biological Significance
ASR	Aquifer storage and recovery
AWTP	Advanced water treatment plant
BIRP	Begonia Iron Removal Plant
BLM	Bureau of Land Management
BMP	Best management practices
CAAQS	California Ambient Air Quality Standards
CAD	Computer Automated Design
Cal OSHA	California Division of Occupational Safety and Health
CalAm	California American Water Company (distribution center)
CalTrans	California Department of Transportation
CAWD	Carmel Area Wastewater District
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCAMP	Central Coast Ambient Monitoring Program
CCC	California Coastal Commission
CCLEAN	Central Coast Long-term Environmental Assessment Network
CCoWS	Central Coast Watershed Studies
CCRWQCB	Central Coast Regional Water Quality Control Board
CCSD	Castroville Community Services District
CDFG	California Department of Fish and Game
CDO	Cease and Desist Order
CDHS	California Department of Health Services
CDPH	California Department of Public Health
CDPR	California Department of Parks and Recreation
CEC	California Energy Commission
CEQA	California Environmental Quality Act
cfs	Cubic feet per second
CGS	California Geological Survey
CHP	California Highway Patrol
CIP	Clean in place (for a membrane system)
CIWR	Center for Integrated Water Research
CNPS	California Native Plant Society
COCs	Contaminants of concern
Corps	United States Army Corps of Engineers (or USACE)
CPCN	Certificate of Public Convenience and Necessity
CPUC	California Public Utilities Commission

CRDRP	Carmel River Dam and Reservoir Project
CSIP	Castroville Seawater Intrusion Project
CSU	California State University
CTR	California Toxics Rule
CVFP	Carmel Valley Filter Plant
CWA	Clean Water Act
CWP	Coastal Water Project
dB	Decibels
dBA	A-weighted decibels
DBP	disinfection byproducts
DEIR	Draft Environmental Impact Report
DRA	Division of Ratepayer Advocates
DTSC	California Department of Toxic Substances Control
DWPS	Desalinated Water Pump Station
DWR	Department of Water Resources
EDR	Environmental Data Resources
EFM	Enhanced flux maintenance
EIR	Environmental Impact Report
ESA	Endangered Species Act
ESF	Elkhorn Slough Foundation
ESNERR	Elkhorn Slough National Estuarine Research Reserve
ETo	Evapotranspiration
FEIR	Final Environmental Impact Report
FEMA	Federal Emergency Management Agency
FLEWR	Filter Loading Evaluation for Water Reuse
FOR A	Fort Ord Reuse Authority
ft	Feet
FTE	Foot Equivalent
GAC	Granular Activated Carbon
GHG	Greenhouse gases
gpm	Gallons per minute
GRRP	Groundwater Recharge Reuse Project
GWUDI	Groundwater under the direct influence of surface water
HAA	haloacetic acid
HDD	Horizontal directional drilling
HDPE	High-density polyethylene
HP	Horsepower
Hwy 218	Canyon Del Rey Boulevard
ID	Internal diameter
KOP	Key Observation Point
kW	Kilowatt
kWh	Kilowatt-hour
lbs/yr	Pounds per year
LF	Linear feet
LOS	Level of Service
LSI	Langlier Saturation Index
LUP/LCP	Land Use Plan/Local Coastal Program
LUST	Leaking underground storage tank
MBNMS	Monterey Bay National Marine Sanctuary
MBUAPCD	Monterey Bay Unified Air Pollution Control District
MCEHD	Monterey County Health Department, Environmental Health Division
MCWD	Marina Coast Water District

MCWRA	Monterey County Water Resources Agency
MEC	Munitions and explosives of concern
MF	Microfiltration
MG	Million gallons
mg/L	Milligrams per liter
mgd	Million gallons per day
MLCSP	Mortar Lined and Course Steel Pipe
MLLW	Mean lower low water
MLML	Moss Landing Marine Laboratories
MLPP	Moss Landing Power Plant
MPWMD	Monterey Peninsula Water Management District
MRSWMP	Monterey Regional Stormwater Management Program
MRWMD	Monterey Regional Waste Management District
MRWPCA	Monterey Regional Water Pollution Control Agency
MSDS	Material Safety Data Sheet
msl	Mean sea level
MST	Monterey-Salinas Transit
MURP	Modern Urban Runoff Program
MW	Megawatts
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NLP	New Los Padres Dam and Reservoir
NOAA	National Oceanic and Atmospheric Association
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRMCP	National Refractories and Minerals Corporation Plant
NTU	Nephelometric turbidity unit
O_3	Ozone
OTC	Once-through cooling
PBCSD	Pebble Beach Community Services District
PEA	Proponent’s Environmental Assessment
PG&E	Pacific Gas and Electric
ppt	Parts per thousand
PPV	Peak Particle Velocity
psi	Pounds per square inch
PSMCSD	Pajaro/Sunny Mesa Community Services District
REPOG	Regional Plenary Oversight Group
RO	Reverse osmosis
ROW	Right-of-way
RTP	Regional Treatment Plant
RUWAP	Regional Urban Water Augmentation Project
RWQCB	Regional Water Quality Control Board
SBD	Ship-based desalination
SCV	Seawater conversion vessel
SEA	Monterey Regional Storm Water & Education Alliance
SEIR	Supplemental environmental impact report
SGB	Seaside Groundwater Basin
SHPO	California State Historic Preservation Office
SRDF	Salinas River Diversion Facility
SVA	Salinas Valley Aquitard

SVGB	Salinas Valley Groundwater Basin
SVIGSM	Salinas Valley Integrated Groundwater Surface Model
SVRP	Salinas Valley Reclamation Plant
SVWP	Salinas Valley Water Project
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	California State Water Resources Control Board
SWTP	Surface water treatment plant
TAMC	Transportation Agency of Monterey County
TDS	Total dissolved solids
thd	Total daily head
THM	Trihalomethane
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbons
TPH	Total Petroleum Hydrocarbons
UC	University of California
UCSC	University of California, Santa Cruz
UPRR	Union Pacific Railroad
USACE	United States Army Corps of Engineers (or Corps)
USEPA	United State Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geologic Survey
UV	Ultraviolet light
VGPS	Valley Greens Pumps Station
VOC	Volatile Organic Compounds
WFMCC	Water for Monterey County Coalition
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant
WY	Water Year

ES. EXECUTIVE SUMMARY

ES.1 Introduction

This Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) has been prepared by the California Public Utilities Commission (CPUC) pursuant to the California Environmental Quality Act (CEQA) and Monterey Bay National Marine Sanctuary (Sanctuary or MBNMS) pursuant to the National Environmental Policy Act (NEPA). This EIR/EIS analyzes the potential environmental impacts of the Monterey Peninsula Water Supply Project (MPWSP or proposed project) proposed by the California American Water Company (CalAm). CalAm is proposing the MPWSP to develop water supplies for CalAm's Monterey District service area (Monterey District). The MPWSP would include a subsurface source water intake system; a desalination plant; a brine discharge system; product water conveyance pipelines, one pump station, storage facilities; and improvements to the existing Seaside Groundwater Basin's aquifer storage and recovery (ASR) system (see Chapter 3, Description of the Proposed Project).

This EIR/EIS has been prepared in accordance with CEQA (Cal. Pub. Res. Code §21000 et seq.) and the CEQA Guidelines (Cal. Code Regs., Tit. 20, Div. 6, Ch. 3, §15000 et seq.), and with NEPA (42 U.S.C. §4321 et seq.,) and its implementing regulations (40 CFR Parts 1500-1508). For the purposes of this document, the CEQA lead agency for the MPWSP is the CPUC; the NEPA lead agency is MBNMS. This EIR/EIS presents information to understand the potential environmental consequences of the proposed project, proposed permit issuance by MBNMS, and alternatives. Consistent with CEQA and NEPA, this Final EIR/EIS includes responses to all comments received on the Draft EIR/EIS that was published on January 13, 2017, and includes revisions to the Draft EIR/EIS text that were made in response to comments (see Section 1.5.3 for details) as well as Lead Agency-initiated changes.

ES.2 Project Background

CalAm, the project applicant, is a privately owned public water utility that has served the Monterey Peninsula since 1966. CalAm's Monterey District encompasses most of the Monterey Peninsula, including the cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside, and the unincorporated areas of Carmel Highlands, Carmel Valley, Pebble Beach, and the Del Monte Forest. Within this service area, CalAm provides water to residential, commercial, industrial, and other customers. The water supply challenges facing CalAm and the Monterey Peninsula are substantial and have been well-documented in a number of venues including the State Water Resources Control Board (SWRCB), the Monterey County Superior Court, the CPUC, and the California Legislature.

In 2004, CalAm filed Application A.04-09-019 seeking a Certificate of Public Convenience and Necessity from the CPUC for the Coastal Water Project. The Coastal Water Project (CWP) was intended to replace existing Carmel River water supplies for the CalAm Monterey District service area that are constrained by legal decisions. In general, the CWP involved the production of desalinated water supplies (using existing intakes at the Moss Landing Power Plant), increasing the yield from the Seaside Groundwater Basin ASR system, and building additional storage and conveyance systems to move the replacement supplies to the existing CalAm distribution system. The CWP was sized to meet existing water demand and did not include supplemental supplies to accommodate growth. On January 30, 2009, the CPUC published a Draft EIR analyzing the environmental impacts of the CWP and two project alternatives—the North Marina Project and the Regional Project. The CPUC published the Coastal Water Project Final EIR (SCH No. 2006101004) in October 2009 and certified the Final EIR in December 2009 (Decision D.09-12-017). A year later, in Decision D.10-12-016, the CPUC approved implementation of the Regional Project alternative. The Coastal Water Project Final EIR is available for review at the CPUC, 505 Van Ness Avenue, San Francisco, California 94102.

Subsequent to approval of the Regional Project, CalAm withdrew its support for the Regional Project in January 2012. As a result, in April 2012, CalAm submitted Application A.12-04-019 to the CPUC for the MPWSP. The MPWSP includes many of the same elements previously analyzed in the CWP EIR; however, key components, including the source water intake system and desalination plant, have been relocated and/or modified under the current proposal. The CPUC issued a Notice of Preparation (NOP) of an EIR for the proposed project on October 10, 2012. Hardcopies of the NOP were mailed to all federal, state, responsible, and trustee agencies involved in approving or funding the project, as well as relevant local agencies and special districts with jurisdiction in the project area. The mailing list also included organizations, members of the public, and local, regional, and state agencies who commented on, or were involved in, the CalAm Coastal Water Project Draft EIR (State Clearinghouse No. 2006101004, concerning the predecessor proposed project to the MPWSP), or who have expressed interest in participating in the CEQA process for the MPWSP. In addition, although not required by CEQA, property owners and occupants of parcels located within 300 feet of proposed project components were identified and sent NOP postcards with information about the project, scoping period, and opportunities for submitting comments. The NOP was also made available at 13 local libraries and was published in local newspapers and legal advertisements. Three scoping meetings were conducted in the project area in October 2012. A Draft EIR on the MPWSP was issued on April 30, 2015. The MPWSP Draft EIR is available for review at the CPUC, 505 Van Ness Avenue, San Francisco, California. In September 2015, after considering the Draft EIR comments and based on conversations with MBNMS and internal CPUC deliberations, the CPUC Energy Division announced that the April 2015 Draft EIR would be modified and recirculated as a joint EIR/EIS in coordination with MBNMS.

On May 19, 2015, MBNMS received a permit application from CalAm and responded on June 16, 2015, that the agency would initiate a NEPA review for the project. On August 26, 2015, NOAA's Office of National Marine Sanctuaries initiated the NEPA process by issuing a Notice of Intent (NOI) to prepare an EIS for the project (80 FR 51787, August 26, 2015). The NOI solicited input on the issues to be analyzed in depth related to the portion of the proposed project within the Sanctuary's boundaries, and regarding the full spectrum of environmental issues and concerns relating to the scope and content of the EIS. On September 10, 2015, MBNMS held a NEPA scoping meeting for the project; the scoping period closed on October 2, 2015. A summary of EIS scoping comments is provided in Appendix A.

On September 15, 2016, in Decision 16-09-021, the CPUC authorized CalAm to enter into a Water Purchase Agreement, which provides that the Monterey Regional Water Pollution Control Agency (MRWPCA) will sell purified water from its advanced treated Pure Water Monterey Groundwater Replenishment (GWR) Project to the Monterey Peninsula Water Management District (MPWMD), which in turn will sell it to CalAm for extraction and distribution to ratepayers in the Monterey District service area. The GWR Final EIR Project Description is presented in Appendix H.

CPUC Decision 16-09-021 also authorized CalAm to construct the new Monterey Pipeline and Pump Station.

ES.3 CEQA Project Objectives / NEPA Purpose and Need

ES.3.1 Project Objectives

Based on review of information in CalAm's application, the primary, or fundamental, objectives of the proposed MPWSP are to:

1. Develop water supplies for the CalAm Monterey District service area to replace existing Carmel River diversions in excess of CalAm's legal entitlement of 3,376 afy, in accordance with SWRCB Orders 95-10 and 2009-0060;
2. Develop water supplies to enable CalAm to reduce pumping from the Seaside Groundwater Basin from approximately 4,000 to 1,474 afy, consistent with the adjudication of the groundwater basin, with natural yield, and with the improvement of groundwater quality;
3. Provide water supplies to allow CalAm to meet its obligation to pay back the Seaside Groundwater Basin by approximately 700 afy over 25 years as established by the Seaside Groundwater Basin Watermaster;

4. Develop a reliable water supply for the CalAm's Monterey District service area, accounting for the peak month demand of existing customers;
5. Develop a reliable water supply that meets fire flow requirements for public safety;
6. Provide sufficient water supplies to serve existing vacant legal lots of record;
7. Accommodate tourism demand under recovered economic conditions;
8. Minimize energy requirements and greenhouse gas emissions per unit of water delivered; and
9. Minimize project costs and associated water rate increases.

The secondary objectives of the MPWSP are to:

1. Locate key project facilities in areas that are protected against predicted future sea-level rise in a manner that maximizes efficiency for construction and operation and minimizes environmental impacts;
2. Provide sufficient conveyance capacity to accommodate supplemental water supplies that may be developed at some point in the future to meet build out demand in accordance with adopted General Plans; and
3. Improve the ability to convey water to the Monterey Peninsula cities by improving the existing interconnections at satellite water systems and by providing additional pressure to move water over the Segunda Grade.

ES.3.2 MBNMS Purpose and Need

Federal proposed actions consist of the following: 1) authorization of a Coastal Development Permit for CalAm to drill into the submerged lands of MBNMS to install a subsurface seawater intake system; 2) authorization of a Central Coast Regional Water Quality Control Board (RWQCB) issued National Pollutant Discharge Elimination System (NPDES) permit to allow for the discharge of brine into MBNMS via an existing ocean outfall pipe; and 3) issuance of a special use permit to CalAm for the continued presence of a pipeline in MBNMS transporting water to or from a desalination facility.

The purpose of these proposed actions is to authorize otherwise prohibited activities to occur within MBNMS, to ensure that the State and Federal permits and the proposed project comply with MBNMS regulations, and to ensure that MBNMS resources are protected by requiring terms and conditions that may be necessary. The need for MBNMS action is to respond to CalAm's permit and authorization request in accordance with NMSA regulations and to protect sanctuary resources.

ES.4 Public & Agency Involvement

ES.4.1 Public and Agency Involvement

This Final EIR/EIS is a public document for use by the CPUC, MBNMS, other governmental agencies, and the public in identifying and evaluating the potential environmental consequences of the proposed project and proposed federal actions, identifying mitigation measures to lessen or eliminate adverse impacts, and examining feasible alternatives to the proposed project. It is expected that the CPUC, MBNMS, and other responsible, trustee, and relevant agencies will use this EIR/EIS in deciding whether to approve the MPWSP or any alternative. The analyses contained within this EIR/EIS will be used to determine any necessary regulatory permits, authorizations, or approvals.

The Draft EIR/EIS was published on January 13, 2017 and was circulated to local, state, and federal agencies as well as interested organizations and individuals who wished to review it. Copies of the Draft EIR/EIS were made available at local libraries and water agencies, and it is available for downloading at http://www.cpuc.ca.gov/Environment/info/esa/mpwsp/comms_n_docs.html. Notice of the Draft EIR/EIS availability was also sent directly to every agency, person, or organization that commented on the CPUC's Notice of Preparation (NOP) or the Sanctuary's Notice of Intent (NOI). The publication of the Draft EIR/EIS marked the beginning of a public review period that ran from January 13, 2017 through March 29, 2017. The Lead Agencies held public meetings in the cities of Marina and Seaside on February 15, 2017, and held a public hearing for the receipt of oral and written comments on the Draft EIR/EIS in Carmel-by-the-Sea, on February 16, 2017.

The Lead Agencies received approximately 85 comment letters, plus 2 form letter submissions (Form Letter 1 consists of 149 one-page letters, and Form Letter 2 consists of 791 one- or two-page letters), sent through mail, hand-delivery, or email, as well as 18 oral comments received at the public hearing. Chapter 8, Draft EIR/EIS Responses to Comments, includes a list of all agencies, organizations, and individuals that submitted comments, copies of all comment letters and the transcript of oral comments, and responses to all comments.

Following circulation of the Draft EIR/EIS and incorporation of public comments and responses to comments (see Chapter 8), this Final EIR/EIS is being published by the CPUC and submitted into the formal record of the Commission's Certificate of Public Convenience and Necessity proceeding (A.12-04-019). Concurrently, NOAA is submitting the Final EIR/EIS to the USEPA and publishing a Notice of Availability in the Federal Register.

ES.4.2 Final EIR/EIS and Revisions Made to the Draft EIR/EIS

Public and agency comments on the Draft EIR/EIS did not require changes in the conclusions of the Draft EIR/EIS that resulted in any new or substantially more severe impacts for the proposed project. Furthermore, there were no changes to the proposed project or to the circumstances under which the proposed project will be undertaken or significant new information relevant to environmental concerns that indicate the proposed project would result in impacts more adverse than disclosed in the Draft EIR/EIS or that additional feasible mitigation measures or alternatives warrant consideration. The following key changes have been incorporated into the Final EIR/EIS, consistent with minor modifications made to the proposed project, other clarifications requested by comments on the Draft EIR/EIS, and Lead Agency-initiated changes:

- Removal of references to, and analysis of, the Terminal Reservoir, which CalAm has indicated is not needed for project operation and no longer proposes as part of the project;

- Addition of the Brine Mixing Box to the description and analysis of the proposed Brine Disposal Pipeline by request of CalAm and Monterey Regional Water Pollution Control Agency (MRWPCA);
- Inclusion of additional brine discharge dilution modeling and Ocean Plan Compliance modeling in Section 4.3, Surface Water Hydrology and Water Quality, by request of MRWPCA (also see Appendices D1 and D3);
- Inclusion of information from recent geophysical studies of seawater intrusion in the Salinas Valley Groundwater Basin (SVGB) – Electrical Resistivity Tomography (ERT) and Airborne Electromagnetics (AEM) – in Section 4.4.1.4, Groundwater Resources;
- Expansion of the SVGB Return Water/Ocean Water Percentage discussion in Section 4.4.1.5, Groundwater Resources;
- Clarification of the capture zone, the cone of depression, aquifer responses to the Deep Aquifers and consistency of the proposed project with the Sustainable Groundwater Management Act (SGMA) in Section 4.4.5.2;
- Revision of Applicant Proposed Measure 4.4-3, Groundwater Monitoring and Avoidance of Well Damage;
- Revision of several mitigation measures to clarify performance standards and provide additional details for implementation;
- Revision of Mitigation Measure 4.11-1 in Section 4.11, Greenhouse Gas Emissions, to require net zero indirect emissions from electricity use during operation (reducing the significance of all impacts related to greenhouse gas emissions from significant and unavoidable to less than significant with mitigation);
- Revision of Impact and Mitigation Measure 4.13-5 in Section 4.13, Public Services and Utilities, to address potential corrosion of the existing outfall as a result of MPWSP brine discharge, including WEKO seal clamp replacement inside the existing offshore segment of the outfall;
- Identification of a NOAA-preferred alternative in Section 5.6, in addition to the environmentally superior/environmentally preferred alternative;
- Revision to Section 6.4, Project Consistency with MBNMS Desalination Guidelines, to include alternatives described in Section 5.4 in the assessment of project conformity with guidelines for desalination plants in MBNMS (see Table 6.4-1); and
- Addition of the Hydrogeologic Working Group's Hydrogeologic Investigation Technical Report as Appendix E3.

Other minor corrections, clarifications, and explanations have been made throughout the document.

ES.4.3 Use of this EIR/EIS in Decision Making

The assigned CPUC Administrative Law Judges (ALJs) will review the Final EIR/EIS and submit a proposed decision to the Commission concerning certification of the EIR/EIS and approval of the MPWSP. If the CPUC certifies the Final EIR/EIS, it will then decide whether or not to grant the Certificate of Public Convenience and Necessity for the MPWSP, as proposed or modified. In addition to environmental impacts addressed during the CEQA process, the Certificate of Public Convenience and Necessity process will consider any other issues that have been established in the record of the proceeding, including but not limited to economic issues, social impacts, specific routing and alignments, and the need for the project.

This Final EIR/EIS will be used by MBNMS, along with other information developed in the formal record (including interagency consultations and/or permits in compliance with the Endangered Species Act, Marine Mammal Protection Act, Magnuson Stevens Act, and the National Historic Preservation Act, among others), to decide whether or not: to authorize a Coastal Development Permit to be issued by the City of Marina under its certified Local Coastal Program, to authorize a NPDES permit to be issued by the Central Coast RWQCB, and to issue a special use permit to CalAm for the continued presence of a pipeline conveying seawater to or from a desalination facility. If MBNMS moves forward with a final action, a 30-day mandatory waiting period will occur after issuance of the Final EIR/EIS, and then MBNMS may issue its Record of Decision (ROD). The decision-making authority for the ROD under NEPA is NOAA's Assistant Administrator for the National Ocean Service (NOAA Administrative Order 216-6A; NOAA, 2016).

ES.5 The Proposed Project

ES.5.1 Description of the Proposed Project

The project area extends approximately 18 miles, from the town of Castroville in the north to the City of Carmel-by-the-Sea in the south (see **Figure ES-1**). The MPWSP would include a source water intake system, which would consist of 10 subsurface slant wells[1] (eight active and two on standby) extending offshore into the submerged lands of MBNMS and a Source Water Pipeline that would convey the source water from the well sites to the desalination plant. The slant wells would be constructed at the CEMEX sand mining site in the northern coastal area of the City of Marina and would extract 24.1 million gallons per day (mgd) of source water through the seafloor in MBNMS.

A 9.6 million gallons per day (mgd) capacity desalination plant would be constructed in unincorporated Monterey County on Charles Benson Road, northeast of the City of Marina and would produce approximately 10,750 acre-feet per year (afy) of desalinated water. Related facilities would include pretreatment, reverse osmosis (RO), and post-treatment systems; backwash supply and filtered water equalization tanks; treated water storage tanks; chemical feed and storage facilities; brine storage and conveyance facilities; and other associated non-process facilities.

The proposed project would also include improvements to the existing Seaside Groundwater Basin aquifer storage and recovery (ASR) system facilities, which would enable CalAm to inject desalinated product water into the groundwater basin for subsequent extraction and distribution to customers. The expanded ASR system would include two additional injection/extraction wells, the ASR-5 and ASR-6 Wells, and three parallel pipelines, the ASR Conveyance Pipeline, ASR

[1] The existing test slant well would be converted into a permanent well, and nine additional slant wells would be built.

Pump-to-Waste Pipeline, and ASR Recirculation Pipeline, and would improve the reliability of the existing ASR system. The proposed project would also include a pump station in Carmel Valley and about 21 miles of water conveyance pipelines.

CalAm's application includes two capacity options or build-out scenarios. The first option, addressed in this document as the "Proposed Project," is a 9.6 mgd desalination plant and related facilities designed to meet the full project objectives for a replacement water supply. The second option would meet the project objectives by combining a reduced-capacity desalination plant (6.4 mgd) with a water purchase agreement for 3,500 acre-feet per year (afy) of advanced treated water from another source, the Pure Water Monterey Groundwater Replenishment (GWR) project. This second capacity option in CalAm's application is reflected in Alternative 5a, which is analyzed in Chapter 5, Alternatives Screening and Analysis. The MRWPCA certified the Final EIR and approved the GWR Project in October 2015; the GWR Project is described in Section 4.1 of Chapter 4, Environmental Setting (Affected Environment), Impacts, and Mitigation Measures and is one of the projects included in the cumulative scenarios. The GWR Final EIR project description is presented in Appendix H.

To inform the final design of the subsurface slant wells and the MPWSP Desalination Plant treatment system, and to collect geologic and hydrogeologic data needed for permitting the full-scale project, CalAm constructed and operated a test slant well at CEMEX. Construction of the test slant well and operation of the pilot program was covered under separate environmental review.[2] The test slant well was originally permitted to operate until February 2018, the permit was extended in November 2017 to allow the test slant well to operate intermittently until February 2019, and the test slant well is not part of the proposed project being evaluated in this EIR/EIS; see Section 8.2.11.8. If the MPWSP with subsurface slant wells at CEMEX is not approved and implemented, the test well will be decommissioned.

ES.5.2 Summary of Potential Impacts and Mitigation Measures for Proposed Project

Chapter 4, Environmental Setting (Affected Environment), Impacts, and Mitigation Measures, of this EIR/EIS evaluates the environmental effects of implementing the proposed project and presents mitigation measures that would reduce potentially significant impacts to less than-significant levels, when feasible. Significant impacts may occur relative to: geology and soils; surface water hydrology and water quality; groundwater resources; terrestrial biological resources; hazards and hazardous materials; land use, land use planning and recreation; traffic and transportation; noise and vibration; utilities; aesthetic resources; cultural and paleontological resources; agricultural resources, and; energy resources. All impacts would be reduced to less-than-significant levels through the implementation of mitigation measures, with the exception of impacts relative to terrestrial biology (inconsistency with City of Marina Local Coastal Land Use Plan policy), air quality (during construction), noise (during construction), and indirect impacts

[2] In October 2014, MBNMS finished its NEPA review of the construction of the test slant well and the operation of the pilot program. In November 2014, the California Coastal Commission completed its review of environmental impacts consistent with CEQA.

NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project
Figure ES-1
Monterey Peninsula Water Supply Project Overview

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from growth. Further, the proposed project may result in significant cumulative impacts when viewed in combination with other past, present, and reasonably foreseeable future projects. The EIR/EIS identifies that with mitigation, the proposed project would not have a considerable contribution to cumulative impacts, and therefore, the project's contribution to cumulative impacts would be less than significant, with the exception of cumulative impacts relative to terrestrial biological resources (inconsistency with the City of Marina Local Coastal Land Use Plan policy during operation), transportation and traffic (during construction), air quality (during construction), noise (during construction), and indirect growth impacts.

ES.6 Alternatives to the Proposed Project

In addition to the proposed project, this EIR/EIS fully evaluates a No Project/No Action alternative, reduced-size alternatives, alternatives with different seawater intake systems, and additional complete desalination project alternatives being proposed by other entities.

ES.6.1 No Project/No Action Alternative

Under the No Project Alternative, the CPUC would not issue a CPCN for the MPWSP or another alternative; MBNMS would not issue authorizations or a special use permit for the components of the project within MBNMS. No new facilities would be constructed and the test slant well would be decommissioned. CalAm would continue to operate its Monterey District facilities in compliance with the 2009 SWRCB Cease and Desist Order (CDO) as amended by SWRCB Order WR 2016-0016 (together referred to herein as the Revised CDO) and the Seaside Groundwater Basin Adjudication.[3] This would also benefit riparian species as discussed in SWRCB Order 95-10. Mandatory rationing and conservation measures would likely be implemented. CalAm would purchase and extract 3,500 afy of Pure Water Monterey Groundwater Replenishment (GWR) Project water from the Seaside Groundwater Basin. The only construction related impacts under this alternative would involve the decommissioning of the test slant well. Potential impacts associated with decommissioning would be similar to the impacts associated with construction activities such as mobilization, site clearance, grading, excavation, and other earthmoving activities in the original construction footprint. However, slant well decommissioning would not involve drilling or excavation but would involve cutting and removing a portion of the well casing, which may result in significant but mitigable impacts on terrestrial biological resources, including:

- Special-Status Species. See Impact 4.6-1 in Section 4.6.5.1. Implementation of Mitigation Measures 4.6-1a through 4.6-1g, 4.6-1i, 4.6-1n, 4.6-1p, 4.12-1b, and 4.14-2 would reduce impacts to a less-than-significant level.
- Sensitive natural communities and critical habitat. See Impact 4.6-2 in Section 4.6.5.1. Implementation of Mitigation Measures 4.6-1a through 4.6-1d, 4.6-1n, 4.6-1p, 4.6-2a, and 4.6-2b would reduce impacts to a less-than-significant level.

[3] The April 2015 MPWSP Draft EIR included two No Project Alternatives: No Project A was consistent with the CDO at the time; No Action B included an extension of the CDO timeframe. The No Project alternative in this EIR/EIS is consistent with the Revised CDO.

- Introduction or spread of invasive non-native species. See Impact 4.6-5 in Section 4.6.5.1. Implementation of Mitigation Measures 4.6-1a and 4.6-1p would reduce impacts to a less-than-significant level.

ES.6.2 Alternative 1 – Slant Wells at Potrero Road

Under Alternative 1, 10 new subsurface slant wells would be constructed at Potrero Road, rather than at the proposed CEMEX site, the test slant well at CEMEX would be decommissioned, and two new wells would be drilled at the existing ASR system. The desalination plant and brine discharge/outfall facilities would be the same as the proposed project. Conveyance pipelines would be the same as the proposed project, with an additional 5.5 miles of source water pipeline extending to Potrero Road.

ES.6.3 Alternative 2 – Open-Water Intake at Moss Landing

Under Alternative 2, a new screened open-water intake with a 36-inch diameter subsurface intake pipeline would be constructed offshore and southwest of Moss Landing in MBNMS, and the test slant well at CEMEX would be decommissioned. The desalination plant and brine discharge/outfall facilities would be the same as the proposed project and two new wells would be drilled at the existing ASR system. Conveyance pipelines would be the same as the proposed project, with an additional 6.5 miles of source water pipeline extending to Moss Landing.

ES.6.4 Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Under Alternative 3, a new screened open-water intake with two 42-inch diameter subsurface intake pipelines and a 110-foot long x 30-foot wide x 12-foot tall intake structure would be constructed offshore and southwest of Moss Landing in MBNMS, and the test slant well at CEMEX would be decommissioned. The new outfall would consist of two 36-inch diameter subsurface discharge pipelines and a 140-foot L x 10-foot W x 15-foot T discharge structure. The 22 mgd desalination plant and co-located data center would be constructed on a 110-acre site off Dolan Road in Moss Landing. Product water would be delivered to CalAm at Dolan Road and Highway 1 and two new wells would be drilled at the existing ASR system. Conveyance pipelines would be the same as the proposed project, with an additional 6.5 miles of product water pipeline, plus two new product water pipelines totaling 25 additional miles to serve Salinas and Santa Cruz County (31.5 additional miles of pipeline, compared to the proposed project).

ES.6.5 Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Under Alternative 4, a new screened open-water intake with two 96-inch diameter screened intakes and a 40-inch diameter discharge pipeline would be constructed offshore Moss Landing in MBNMS, and the test slant well at CEMEX would be decommissioned. The new outfall at Moss Landing would be an extension of an existing outfall with a 36-inch diameter pipeline and two 16-inch diameter diffuser ports. The 12 mgd desalination plant would be constructed at the former National Refractories facility in Moss Landing. Product water would be delivered to

CalAm at Dolan Road and Highway 1, with a 6.5 mile pipeline that connects with the proposed project pipelines at Marina and two new wells would be drilled at the existing ASR system.

ES.6.6 Alternative 5a – Reduced Project 6.4 mgd Desalination Plant (Intake Slant Wells at CEMEX)

Under Alternative 5a, fewer slant wells (7) would be constructed at CEMEX compared to the proposed project; the brine discharge/outfall facilities would be the same as the proposed project, and a 6.4 mgd desalination plant would be constructed at the Charles Benson Road site. CalAm would purchase and extract 3,500 afy of GWR Project water from the Seaside Groundwater Basin.

ES.6.7 Alternative 5b – Reduced Project 6.4-mgd Desalination Plant (Intake Slant Wells at Potrero Road)

Under Alternative 5b, fewer slant wells (7) would be constructed at Potrero Road than Alternative 1, and the test slant well at CEMEX would be decommissioned; the brine discharge/outfall facilities would be the same as the proposed project and Alternative 1, and a 6.4 mgd desalination plant would be constructed at the Charles Benson Road site. The conveyance pipelines would be the same as the proposed project, with an additional 5.5 miles of source water pipeline. CalAm would purchase and extract 3,500 afy of GWR Project water from the Seaside Groundwater Basin.

ES.7 Comparison of Alternatives, Environmentally Superior/Environmentally Preferred Alternative, and NOAA-Preferred Alternative

Comparing the results of the analysis of alternatives presented in Chapter 5 (Alternatives Screening and Analysis), with the results of the analysis of the proposed project presented in Chapter 4 (Environmental Setting, Impacts, and Mitigation Measures), provides a basis for identifying the environmentally superior alternative under CEQA and the environmentally preferred alternative under NEPA. **Table ES-1** presents the impact conclusion for each impact statement, for every topical area evaluated, for the proposed project and for all alternatives, and provides a relative impact severity for each alternative (increased, decreased or same) compared to the proposed project; beneficial impacts are highlighted in green.

ES.7.1 Key Impact Differences Between Alternatives

The following discussion summarizes key differences in the significant environmental impacts among the alternatives.

Under the No Project Alternative, although impacts from project construction would be avoided, impacts associated with decommissioning of the test slant well would be similar to the impacts associated with construction activities such as mobilization, site clearance, grading, excavation, and other earthmoving activities in the original construction footprint. However, slant well decommissioning would not involve drilling or excavation but would involve cutting and removing a portion of the well casing. Under the No Project Alternative, it would not be possible to meet the proposed project objectives; reliance on existing and planned water conservation and recycling programs would continue. The implementation of mandatory rationing and conservation measures would be likely. The lack of water supply would adversely affect the region's economic vitality. The reduction of available water supply by almost 40 percent could lead to water shortages throughout the CalAm Monterey District service area, impacting all economic sectors, including the County's "four pillars" – agriculture, tourism, education, and research – by substantially reducing the reliability of water resources and water infrastructure.

Under the No Project Alternative, current diversions from the Carmel River would continue, consistent with existing conditions in the short-term. However, CalAm would not meet CDO milestones associated with the construction and implementation of the MPWSP. As a result, diversions from the Carmel River would be required to be reduced sooner than under the proposed project and Carmel River flows would be restored by a total of 10,000 acre-feet over the period of October 2018 through 2021. The increases to Carmel River flows under the No Project Alternative would be beneficial to Carmel River steelhead habitat. Since no construction would occur under the No Project Alternative, there would be no impacts on special-status species, such as western snowy plover and Smith's blue butterfly, that would be impacted by the proposed project. However, decommissioning of the test slant well could result in potentially significant but mitigable secondary impacts on terrestrial biological resources, including:

- Special-Status Species. See Impact 4.6-1 in Section 4.6.5.1. Implementation of Mitigation Measures 4.6-1a through 4.6-1g, 4.6-1i, 4.6-1n, 4.6-1p, 4.12-1b, and 4.14-2 would reduce impacts to a less-than-significant level.
- Sensitive natural communities and critical habitat. See Impact 4.6-2 in Section 4.6.5.1. Implementation of Mitigation Measures 4.6-1a through 4.6-1d, 4.6-1n, 4.6-1p, 4.6-2a, and 4.6-2b would reduce impacts to a less-than-significant level.
- Introduction or spread of invasive non-native species. See Impact 4.6-5 in Section 4.6.5.1. Implementation of Mitigation Measures 4.6-1a and 4.6-1p would reduce impacts to a less-than-significant level.

Alternative 2 (Open-Water Intake at Moss Landing), Alternative 3 (DeepWater Desal Project), and Alternative 4 (People's Project) would use screened, open water intakes, which would reduce or avoid several potential proposed project impacts on groundwater because of the absence of slant well pumping for source water, but would result in new significant impacts on marine biological resources. Significant and unavoidable impacts on marine habitat and biological resources would result from the in-water construction of new open water intakes. Operation of screened open-water intakes for all three alternatives would result in impingement and entrainment of marine organisms, resulting in significant long-term direct and indirect effects on marine biological resources within MBNMS in Monterey Bay, even with implementation of mitigation measures.

For Alternative 3 (DeepWater Desal Project) and Alternative 4 (People's Project), operation of a new, brine-only outfall (no co-mingling with wastewater or other diluent flows) could result in significant and unavoidable water quality impacts from increased levels of salinity and concentrations of certain other constituents. Due to the proximity of live-aboard boats in Moss Landing Harbor, construction activities would result in exposure of more sensitive receptors to substantial pollutant concentrations from construction equipment emissions, resulting in a significant and unavoidable impact. Both of these alternatives would produce more desalinated water than the proposed MPWSP, resulting in more water being available that would remove an impediment to and potentially support increased growth in the three county-region.

Alternative 3 (DeepWater Desal Project) may result in significant and unavoidable impacts from energy use from operation of the co-located data center that would constrain local or regional supplies and require additional capacity. Operation of emergency generators would use large amounts of fuel in a manner that would be unnecessary and wasteful, resulting in a significant and unavoidable impact.

For Alternative 4 (People’s Project), construction of the desalination plant could impact (currently unsurveyed) historical resources, resulting in a significant and unavoidable impact. Operation and siting of the intake pumping facilities on top of the existing caisson at the existing shoreline could result in long-term direct effects on coastal erosion and scour processes that could expose adjacent properties to coastal flooding and a change in sediment transport, resulting in potentially significant impacts. In addition, being within a 100-year flood zone could cause long-term direct effects related to redirection of flood flows, resulting in a significant and unavoidable impact. The intake pumping facilities on top of the existing caisson would result in impacts on the visual quality of the shoreline in Moss Landing and interrupt views of MBNMS resources, resulting in potentially significant impacts.

Alternatives 1 and 5b would include operation of the slant wells at Potrero Road (for a 9.6 mgd or a 6.4 mgd desalination plant, respectively). Alternative 5b would lower groundwater levels in the Dune Sands/Perched-A aquifers in the Moss Landing area. Operation of Alternative 1 would additionally lower groundwater levels in the 180- and 400-foot aquifers, thereby capturing groundwater that would have otherwise flowed into Elkhorn Slough. The direct and indirect permanent effects on marine and terrestrial biological resources at Elkhorn Slough from the operation of slant wells at Potrero Road (Alternatives 1 or 5b) and the lowering of groundwater levels would result in significant and unavoidable impacts.

The proposed project and Alternative 5a would not affect Elkhorn Slough; there would be no construction on the seafloor; and impacts on groundwater resources, surface water resources and marine biological resources would be localized and less than significant. The proposed project and Alternative 5a would use an existing outfall and would co-mingle brine with wastewater; they would each meet Ocean Plan Water Quality objectives for salinity within a very short distance; they would avoid impingement and entrainment of marine organisms associated with an open water intake; and with mitigation, they would be consistent with the Ocean Plan and MBNMS Desalination Guidelines. While the proposed slant wells at CEMEX would be inconsistent with the City of Marina’s Local Coastal Plan Land Use Plan policy (and thereby would cause a significant and unavoidable impact when considered with the test slant well at the CEMEX site), Coastal Act Section 30260 encourages coastal-dependent industrial uses and provides for resolution of conflicting Coastal Act policies where such development is concerned.

ES.7.2 Environmentally Superior/Environmentally Preferred Alternative and NOAA-Preferred Alternative

This Final EIR/EIS identifies Alternative 5a as the environmentally superior/environmentally preferred alternative, assuming implementation of the GWR Project. Alternative 5a is also the NOAA-preferred alternative. While the combined Alternative 5a and GWR Project would result in a larger physical footprint than the proposed project alone, the pairing of Alternative 5a and the GWR project would result in reduced operational energy use, reduced GHG emissions, and reduced effects on groundwater levels influenced by fewer slant wells and less volume of pumping, compared to the proposed project. The GWR project would also provide water to growers through the Castroville Seawater Intrusion Project that would benefit the groundwater basin. In addition, Alternative 5a paired with the GWR project would be consistent with the 2016 California Action Plan seeking integrated water supply solutions, the Governor's drought proclamations, the CPUC Water Action Plan goal of promoting water infrastructure investment, the Ocean Plan and MBNMS Desalination Guidelines.

ES.8 Areas of Controversy and Issues to be Resolved

Pursuant to Section 15123(b)(1) of the state CEQA Guidelines and NEPA regulations (40 CFR 1502.12), an EIR/EIS shall identify areas of controversy known to the lead agency including issues raised by agencies and the public and the issues to be resolved (including the choice among alternatives and whether or how to mitigate the significant effects).

The following areas of controversy and issues to be resolved were raised through the scoping and public meetings conducted in association with circulation of the NOP and NOI, comments submitted on the 2015 MPWSP Draft EIR, and comments submitted on the 2017 MPWSP Draft EIR/EIS.

- **Demand to be Met by the Proposed Project and Desalination Plant Sizing**

  Comments were received advocating that the desalination plant be sized to provide supply to replace the portions of CalAm's existing Carmel River and Seaside Groundwater Basin supplies that have been constrained by legal decisions (in compliance with SWRCB Orders 95-10 and 2016-0016 and the adjudication of the Seaside Groundwater Basin) to meet current service area demand only. Since demand has continued to decline over the past several years, some comments suggest the proposed project should plan to serve a smaller demand of current customers, and suggest that a desalination plant may not even be necessary. Other comments expressed support for sizing the plant to accommodate differing degrees of additional future demand (e.g., demand associated with the development of vacant legal lots of record, demand associated with full general plan buildout, etc.). Chapter 2, Water Demand, Supplies, and Water Rights, discusses existing service area demand and supplies and the level of demand the MPWSP proposes to meet, and Section 6.3, Growth-Inducing Impacts, evaluates the growth inducement potential of the water supply proposed to be provided by the MPWSP that would exceed current customers' demands. In addition, Master Response 13, Demand (Project Need) and Growth, in Section 8.2.13, responds to comments on the Draft EIR/EIS that concerned customer water demand, available water supplies, and growth that could be induced by the proposed MPWSP water supply.

- **Groundwater Modeling, Impacts and Water Rights**

  CalAm's proposed use of subsurface slant wells to withdraw source water for the MPWSP Desalination Plant is the subject of two controversies: (1) whether CalAm has the legal right to extract groundwater from the Salinas Valley Groundwater Basin (SVGB); and (2) whether implementation of the MPWSP and operation of the subsurface slant wells would exacerbate seawater intrusion in the SVGB and harm the existing water supply of other users of the SVGB, particularly Marina Coast Water District (MCWD). The proposed subsurface slant wells at CEMEX would be screened in aquifer units of the SVGB that have long been intruded by seawater. Although the subsurface slant wells would draw water (i.e., source water for the MPWSP Desalination Plant) from beneath the ocean floor, a fraction of the source water would be drawn from inland portions of the SVGB; therefore, the source water would at least initially be a combination of brackish groundwater and seawater. After pumping begins, the wells would extract increasing proportions of infiltrating recharge from the ocean. The ocean recharge would gradually replace the ambient groundwater within what is defined as the capture zone, and would move within the capture zone toward the well, but would not advance beyond the capture zone. This EIR/EIS focuses the definitions of groundwater and seawater based on their chemical properties rather than on their location; see Chapter 3 and Section 4.4.

  In 2012, the CPUC asked the SWRCB to provide an opinion regarding whether CalAm has the legal right to extract source water for the MPWSP Desalination Plant from offshore aquifers of the SVGB. The SWRCB has indicated that for CalAm to appropriate groundwater from the SVGB, the MPWSP EIR/EIS must demonstrate that the proposed project will not harm or cause injury to other basin users (SWRCB, 2013) and made certain recommendations for further study.

  The recommendations of the SWRCB have been implemented by a Hydrogeologic Working Group (HWG) comprised of licensed hydrogeologists with pertinent experience in the Monterey Bay region. The HWG was a result of an August 2013 Settlement Agreement between CalAm and 16 parties whereby CalAm agreed their hydrologist and technical team would work with the Salinas Valley Water Coalition's and Monterey County Farm Bureau's assigned hydrogeologists. The HWG developed a work plan in order to reach agreement about the studies, well tests, field work, modeling, monitoring, and other data analyses that is needed to assess and characterize whether and to what extent the proposed operation of the MPWSP may adversely affect the SVGB and the water supply available to legal water users thereof. The resulting hydrogeological study informed the analysis presented in Section 4.4, Groundwater Resources, as well as the corresponding analysis in Chapter 5, Alternatives. Refer to Section 2.6 in Chapter 2, Water Demand, Supplies, and Water Rights, for a discussion of water rights. The workplan and results of the work plan are presented in EIR/EIS Appendix E3.

  Furthermore, the groundwater model and results presented in the 2015 Draft EIR have been revised to address questions about the accuracy and credibility of the groundwater modeling work that was the subject of potential conflict of interest comments. The CPUC made the groundwater data files used in the April 2015 Draft EIR available for public review. The CPUC employed the Lawrence Berkeley National Laboratory to conduct an independent evaluation of that data; the results of that evaluation are provided in Appendix E1. The CPUC hired a new hydrogeologist (HydroFocus) to revise the groundwater model; see Appendix E2. The groundwater analysis from the 2015 Draft EIR has been updated to reflect the results of the new and revised groundwater model.

Similar comments were received on the Draft EIR/EIS with regard to water rights, source water, the HWG, and groundwater modelling. See Master Responses 2, 3, 5, 8, and 12 in Chapter 8 for a full discussion of these issues.

- **Private (Versus Public) Ownership of the Desalination Plant**

  A Monterey County ordinance (Health and Safety Code Section 10.72.030 [the Monterey County Desalination Ordinance]) prohibits ownership of a desalination plant by a private entity and at one point in time, Monterey County had filed a lawsuit against CalAm on the issue. In October 2012 and July 2013, the CPUC concluded that the Monterey County Desalination Ordinance is in conflict with California law and that the CPUC's authority preempts the Monterey County Desalination Ordinance to the extent that the ordinance purports to apply to public utility facilities or operations. The CPUC's 2013 decision noted that the Court action initiated by the County had since been dismissed. The Settlement Agreement entered into between CalAm and other parties in August 2013 includes provisions that address project governance and financing that are intended to ensure the consideration of community values and public agency representation in all the important aspects of the MPWSP and to lower project costs, respectively. While the CPUC decisions and provisions of the proposed Settlement Agreement address concerns related to the private ownership of the MPWSP, it is expected that some concerns about this issue may remain.

- **Brine Discharge**

  During scoping and evidentiary hearings, many commenters expressed concerns about the proposed discharge of desalination plant brine to Monterey Bay within MBNMS. Comments primarily focused on the potential effect of brine discharges on benthic habitats and the marine environment, including impacts close to the point of discharge as well as longer term impacts at greater distances associated with the migration of the brine plume. In addition, concerns were expressed over the potential for hypoxia to occur near the seabed as a result of proposed MPWSP operational discharges. Hypoxia, or oxygen depletion, is an environmental phenomenon where the concentration of dissolved oxygen in the water column decreases to a level that can no longer support living aquatic organisms.

  Concerns were raised about the consistency of MPWSP brine discharges with MBNMS and California Ocean Plan standards and requirements, the effects of combining brine with wastewater effluent, and the reduction of effluent that would be available for use as an alternative water source if effluent was used to dilute brine.

  New brine discharge dilution modeling has been performed, resulting in refinements and clarification of the modeling outcomes relative to the Ocean Plan water quality objectives. The direct, indirect, and cumulative effects of brine discharges on water quality are addressed in Chapter 4, Section 4.3, Surface Water Hydrology and Water Quality; the direct, indirect, and cumulative effects of brine discharges on the marine environment are addressed in Section 4.5, Marine Biological Resources; and the effects of the proposed project on outfall capacity are addressed in Section 4.13, Public Services and Utilities.

- **Alternatives**

  While this EIR/EIS evaluates the MPWSP as proposed by CalAm, other parties are pursuing the development of other desalination projects to provide potable water supply to the Monterey Peninsula and beyond. The Monterey Bay Regional Water Project, proposed by DeepWater Desal, LLC, would provide up to 25,000 afy of potable water supply to serve participating communities in the Monterey Bay region, potentially including the Monterey Peninsula, Castroville, Salinas, and parts of Santa Cruz County. The People's Moss Landing Water Desalination Project (People's Project), proposed by Moss Landing Commercial Business Park, LLC, would provide 13,404 afy (11.97 mgd) of potable water supply to serve North Monterey County and the Monterey Peninsula. Chapter 5, Alternatives, presents information on these other desalination projects based on available information, and includes analysis of these projects as alternatives to the proposed MPWSP project. In addition, Master Response 15, Alternative Desalination Projects – Status, Information Sources, and Cumulative Scenario in Section 8.2.15 responds to comments received on the 2017 Draft EIR/EIS and provides clarification on the status of the DeepWater Desal Project and People's Project (to the extent that information is available), and also addresses questions on assumptions used for considering cumulative impacts of these projects.

- **Greenhouse Gas Emissions (GHG) and De-Gassing**

  Comments on the 2015 Draft EIR raised concerns about GHG emissions from subsurface intakes and requested that CO_2 degassing from intake water to the atmosphere be analyzed. These issues are addressed in Section 4.11, Greenhouse Gas Emissions. Furthermore, at the time of publication of the 2017 Draft EIR/EIS, it was not possible to substantiate numerically that the GHG emissions, resulting from construction and operation of the proposed project, would be reduced to less than significant level. Since publication, a detailed mitigation strategy was developed that enabled quantification of reductions with sufficient certainty to support the determination of less than significant with mitigation.

- **Coastal Erosion**

  Sea level rise is expected to continue over the next century, in turn accelerating coastal erosion and resulting in the inland retreat of the Monterey Bay coastline. Concerns were raised that coastal erosion could expose subsurface elements of the proposed project such as the slant wells, slant well vaults, and associated infrastructure, potentially damaging them and shortening their lifespan, while the exposed wells and associated structures could also present a hazard to recreational activities. A project-specific coastal retreat study was conducted to evaluate erosion impacts associated with project components in the coastal zone and determined that the slant wells, in their originally-proposed locations, could be undermined and exposed within the project lifetime. Consequently, the slant well sites were moved farther inland. Section 4.2, Geology, Soils, and Seismicity, describes the issues related to sea level rise and coastal erosion in more detail and evaluates the potential impacts on coastal erosion resulting from the proposed slant wells and associated infrastructure.

- **Intake Technologies**

  Several state and federal regulatory and permitting agencies (SWRCB, California Coastal Commission (CCC)) will not consider permitting an open-water intake unless a subsurface intake has been deemed infeasible or would result in greater environmental impacts. NOAA's MBNMS and National Marine Fisheries Service also established guidelines for discretionary approvals for new intake structures stating that subsurface intakes should be used where feasible and beneficial. CalAm has proposed subsurface intakes (slant wells) to supply source water to the MPWSP. Chapter 4 of this EIR/EIS evaluates the potential impacts of the proposed project and Chapter 5, Alternatives, presents an extensive analysis of alternative intake technologies and locations. Section 8.2.11.8 discusses the evolving subsurface intake technology and Appendix E3 presents the results of the test slant well long term pump test.

- **Environmentally Sensitive Habitat, the Coastal Act and City of Marina Local Coastal Land Use Plan**

  In order to implement the MPWSP-proposed subsurface intakes, CalAm will be required to secure a Coastal Development Permit (CDP) under the California Coastal Act. The City of Marina has an approved Local Coastal Program (LCP) and would be responsible for issuing this permit. The CalAm Summer 2014 application to the City of Marina for a CDP associated with the exploratory bore holes at CEMEX, and the City's Fall 2014 denial of CalAm's application for a CDP associated with the test slant well, proved to be very controversial. Even after the CCC approved the test well in November 2014, several lawsuits were filed to stop the drilling and the associated pump test. Section 4.6, Terrestrial Biological Resources, addresses the potential terrestrial biological impacts associated with construction and operation of the proposed slant wells at CEMEX, including analysis of potential inconsistencies with the City of Marina LCP Land Use Plan policy; and Section 4.4, Groundwater Resources addresses the potential groundwater impacts associated with construction and operation of the slant wells at CEMEX.

- **Monterey Pipeline**

  Comments were received on the April 2015 Draft EIR and the 2015 Federal Register Notice of Intent, expressing concerns about the Monterey Pipeline. Originally proposed by CalAm to follow a coastal route, the new Monterey Pipeline was evaluated as an alternative route in the April 2015 Draft EIR and in the October 2015 GWR Final EIR. The new 5.4-mile-long, 36-inch-diameter pipeline would allow for bi-directional flows of potable water between the GWR Project and the Monterey Peninsula and allow CalAm to maximize the benefits of water produced by the GWR and, through utilization of the ASR, allow CalAm to reduce reliance on Carmel River diversions. Concerns have been expressed about the construction impacts and cost of the pipeline that would include right angle, 45-degree bends and welded junctions. The CPUC approved the new Monterey Pipeline and Pump Station in September 2016, along with the Water Purchase Agreement for the GWR Project. In so doing, the Commission found that benefits associated with the pipeline/pump station project outweighed the significant and unavoidable impact to noise resources that will result from temporary construction. Therefore, as approved projects with utility independent from the proposed project, the Monterey Pipeline and Pump Station are evaluated as cumulative projects in this EIR/EIS since they are no longer a part of the proposed project.

TABLE ES-1
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.2: Geology, Soils, and Seismicity							
Impact 4.2-1: Substantial soil erosion or loss of topsoil during construction.	**LSM**	**NI** ↓	**LSM** ↑	**LSM** ↑	**LSM** ↑	**LSM** ↑	**LSM** ↓
Impact 4.2-2: Exposure of people or structures to substantial adverse effects related to fault rupture.	**LS**	**NI** ↓	**LS** =	**LS** =	**LS** =	**LS** =	**LS** =
Impact 4.2-3: Exposure of people or structures to substantial adverse effects related to seismically-induced groundshaking.	**LS**	**NI** ↓	**LS** =	**LS** =	**LS** =	**LS** =	**LS** =
Impact 4.2-4: Exposure of people or structures to substantial adverse effects related to seismically-induced ground failure, including liquefaction, lateral spreading, or settlement.	**LS**	**NI** ↓	**LS** =	**LS** =	**LS** =	**LS** =	**LS** =
Impact 4.2-5: Exposure of people or structures to substantial adverse effects related to landslides or other slope failures.	**LS**	**NI** ↓	**LS** =	**LS** =	**LS** =	**LS** =	**LS** =
Impact 4.2-6: Exposure of people or structures to substantial adverse effects related to expansive soils.	**LS**	**NI** ↓	**LS** =	**LS** =	**LS** =	**LS** =	**LS** =
Impact 4.2-7: Exposure of structures to substantial adverse effects related to corrosive soils.	**LS**	**NI** ↓	**LS** =	**LS** =	**LS** =	**LS** =	**LS** =
Impact 4.2-8: Exposure of people or structures to substantial adverse effects related to land subsidence.	**NI**	**NI** ↓	**NI** =	**NI** =	**NI** =	**NI** =	**NI** =
Impact 4.2-9: Exposure of people or structures to substantial adverse effects related to alternative wastewater disposal systems.	**LS**	**NI** ↓	**LS** =	**LS** ↓	**LS** ↓	**LS** ↓	**LS** =
Impact 4.2-10: Accelerate and/or exacerbate natural rates of coastal erosion, scour, or dune retreat, resulting in damage to adjoining properties or a substantial change in the natural coastal environment.	**LSM**	**NI** ↓	**NI** ↓	**NI** ↓	**NI** ↓	**SU** ↑	**5a: LSM** = **5b: NI** ↓
Impact 4.2.11: Degrades the physical structure of any geologic resource or alters any oceanographic process, such as sediment transport, that is measurably different from pre-existing conditions.	**NI**	**NI** ↓	**NI** =	**SU** ↑	**SU** ↑	**SU** ↑	**NI** =
Impact 4.2-C: Cumulative impacts related to Geology, Soils, and Seismicity.	**LSM**	**NI** ↓	**LSM** =	**SU** ↑	**LSM** =	**SU** ↑	**LSM** =

TABLE ES-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.3: Surface Water Hydrology and Water Quality							
Impact 4.3-1: Degradation of water quality associated with increased soil erosion and inadvertent releases of hazardous chemicals during general construction activities.	LS	LS ↓	LS ↑	LS ↑	SU ↑	SU ↑	LS ↓
Impact 4.3-2: Degradation of water quality from construction-related discharges of dewatering effluent from open excavations and water produced during well drilling and development.	LSM	NI ↓	LSM ↑	LSM =	LSM ↑	LSM ↓	LSM ↓
Impact 4.3-3: Degradation of water quality from discharges of treated water and disinfectant from existing and newly installed pipelines during construction.	LS	NI ↓	LS ↑	LS =	LS ↑	LS ↓	5a: LS = 5b: LS ↑
Impact 4.3-4: Violate water quality standards or waste discharge requirements or degrade water quality from increased salinity as a result of brine discharge from the operation of the MPWSP Desalination Plant.	LSM	NI ↓	LSM =	LSM =	LSM ↑	SU ↑	LSM =
Impact 4.3-5: Violate water quality standards or waste discharge requirements or degrade water quality as a result of brine discharge from the operation of the MPWSP Desalination Plant.	LSM	NI ↓	LSM =	LSM =	LSM ↑	SU ↑	LSM =
Impact 4.3-6: Degradation of water quality due to discharges associated with maintenance of the subsurface slant wells and the ASR -5 and ASR-6 Wells.	LS	NI ↓	LS =	LS ↑	LS ↑	LS ↑	LS ↓
Impact 4.3-7: Alteration of drainage patterns such that there is a resultant increase in erosion, siltation, or the rate or amount of surface runoff.	LS	NI ↓	LS ↓	LS ↓	LS ↑	LS ↓	LS =
Impact 4.3-8: Alteration of drainage patterns such that there is an increase in flooding on- or offsite or the capacity of the stormwater drainage system is exceeded.	LS	NI ↓	LS ↑	LS ↓	LS ↑	LS ↓	LS ↓
Impact 4.3-9: Impedance or redirection of flood flows due to the siting of project facilities in a 100-year flood hazard area.	LS	NI ↓	LS ↓	LS =	LS ↓	SU ↑	5a: LS = 5b: LS ↓
Impact 4.3-10: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to a tsunami.	LS	NI ↓	LS ↓	LS =	LS ↓	SU ↑	LS =
Impact 4.3-11: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise.	LS	NI ↓	LS ↓	LS =	LS ↓	SU ↑	LS =
Impact 4.3-C: Cumulative impacts related to Surface Water Hydrology and Water Quality.	LSM	NI ↓	LSM =	LSM =	LSM ↑	SU ↑	LSM =

TABLE ES-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.4: Groundwater Resources							
Impact 4.4-1: Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level during construction.	NI	NI =	NI =	NI =	NI =	NI =	NI =
Impact 4.4-2: Violate any water quality standards or otherwise degrade groundwater quality during construction.	LS	NI ↓	LS =	LS ↑	LS ↑	LS ↑	LS =
Impact 4.4-3: Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level during operations so as to expose well screens and pumps.	LS	NI ↓	LS ↓	LS ↓	LS ↓	LS ↓	5a: LS ↓ 5b: LS =
Impact 4.4-4: Violate any water quality standards or otherwise degrade groundwater quality during operations.	LSM	NI ↓	LS ↓	LS ↓	LS ↓	LS ↓	5a: LSM = 5b: LS ↓
Impact 4.4-C: Cumulative impacts related to Groundwater Resources.	LS	NI ↓	NI ↓	NI ↓	NI ↓	NI ↓	5a: LS = 5b NI ↓
Section 4.5: Marine Resources							
Impact 4.5-1: Result in a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any marine species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH); or as identified by the CDFW, USFWS, and/or NMFS during construction	LS	NI ↓	LS ↑	SU ↑	SU ↑	SU ↑	LS ↓
Impact 4.5-2: Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels during construction.	LS	NI ↓	LS ↑	LS ↑	LS ↑	LS ↑	LS ↓
Impact 4.5-3: Interfere substantially with the movement of any native marine resident or migratory fish or marine wildlife species or with established native resident or migratory marine wildlife corridors, or impede the use of native marine wildlife nursery sites during construction.	LS	NI ↓	LS ↑	LS ↑	LS ↑	LS ↑	LS ↓
Impact 4.5-4: Result in a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any marine species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH); or as identified by the CDFW, USFWS, and/or NMFS during operations.	LS	NI ↓	SU ↑	SU ↑	SU ↑	SU ↑	5a: LS = 5b: SU ↑

TABLE ES-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.5: Marine Resources (cont.)							
Impact 4.5-5: Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels during operations.	LS	NI ↓	LS =	LS ↑	LS =	LS =	LS ↓
Impact 4.5 6: Interfere substantially with the movement of any native marine resident or migratory fish or marine wildlife species or with established native resident or migratory marine wildlife corridors, or impede the use of native marine wildlife nursery sites during operations.	LS	NI ↓	LS =	LS ↑	LS =	LS =	LS ↓
Impact 4.5-C: Cumulative impacts on Marine Resources.	LS	NI ↓	LS =	SU ↑	NI ↓	SU ↑	LS ↓
Section 4.6: Terrestrial Biological Resources							
Impact 4.6-1: Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification, during construction.	LSM	LSM ↓	LSM =	LSM ↓	LSM ↑	LSM =	LSM =
Impact 4.6-2: Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during construction.	LSM	LSM ↓	LSM =	LSM ↓	SU ↑	LSM =	LSM =
Impact 4.6-3: Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the State during construction.	LSM	NI ↓	LSM =	LSM =	LSM ↑	LSM ↑	LSM =
Impact 4.6-4: Be inconsistent with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance with local tree ordinances.	SU	NI ↓	SU ↓	SU =	SU =	SU =	SU =
Impact 4.6-5: Introduce or spread an invasive non-native species during construction.	LSM	LSM ↓	LSM =	LSM =	LSM =	LSM =	LSM =
Impact 4.6-6: Result in substantial adverse effects on candidate, sensitive, or special-status species during project operations.	LSM	↓	LSM =	LSM ↓	LSM =	LSM =	LSM =
Impact 4.6-7: Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during project operations	LSM	↓	SU ↑	LSM ↓	LSM =	LSM =	5a: LSM = 5b: SU ↑
Impact 4.6-8: Result in substantial adverse effects on federal wetlands, federal other waters, and waters of the State during project operations.	LSM	NI ↓	LSM =	NI ↓	LSM =	LSM =	LSM =
Impact 4.6-9: Introduce or spread an invasive non-native species during project operations.	LSM	NI ↓	NI ↓	NI ↓	NI ↓	NI ↓	5a: LSM = 5b: NI ↓

TABLE ES-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.6: Terrestrial Biological Resources (cont.)							
Impact 4.6-10: Conflict with the provisions of an adopted Habitat Conservation Plans, natural community conservation plans or other approved local, regional, or state habitat conservation plan.	LSM	NI ↓	LSM =	LSM =	LSM =	LSM =	LSM =
Impact 4.6-C: Cumulative impacts related to Terrestrial Biological Resources.	SU	LS ↓	SU =	SU =	LSM ↓	SU =	SU ↑
Section 4.7: Hazards and Hazardous Materials							
Impact 4.7-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials during construction.	LS	NI ↓	LS ↑	LS ↑	LS ↑	LS ↑	LS ↓
Impact 4.7-2: Encountering hazardous materials from other hazardous materials release sites during construction.	LSM	LSM ↓	LSM =	LSM ↑	LSM ↑	LSM ↑	LSM =
Impact 4.7-3: Project facilities would be located on a known hazardous materials site.	LS	NI ↓	LS =	LS ↑	LS ↑	LS ↑	LS =
Impact 4.7-4: Handle hazardous materials or emit hazardous emissions within 0.25 mile of schools during construction.	LS	NI ↓	LS =	LS =	LS =	LS =	LS =
Impact 4.7-5: Increase risk of wildland fires during construction.	LS	NI ↓	LS =	LS =	LS =	LS =	LS =
Impact 4.7-6: Create a significant hazard to the public or the environment through the routine transport, use, disposal, or accidental release of hazardous materials during project operations.	LS	NI ↓	LS =	LS =	LS ↑	LS ↑	LS ↓
Impact 4.7-C: Cumulative impacts related to Hazards and Hazardous Materials.	LSM	LS ↓	LSM =	LSM ↑	LSM ↑	LSM ↑	LSM =
Section 4.8: Land Use, Land Use Planning, and Recreation							
Impact 4.8-1: Consistency with applicable plans, policies, and regulations related to land use and recreation that were adopted for the purpose of mitigating an environmental effect.	LS	NI ↓	LS =	LS =	LS =	LS =	LS =
Impact 4.8-2: Disrupt or preclude public access to or along the coast during construction.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM = 5b: LSM ↑
Impact 4.8-C: Cumulative impacts related to Land Use, Land Use Planning, and Recreation.	LSM	NI ↓	LSM =	LSM =	LSM =	LSM =	LSM =

TABLE ES-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.9: Traffic and Transportation							
Impact 4.9-1: Temporary traffic increases on regional and local roadways due to construction-related vehicle trips.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM = 5b: LSM ↑
Impact 4.9-2: Temporary reduction in roadway capacities and increased traffic delays during construction.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM = 5b: LSM ↑
Impact 4.9-3: Increased traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways during construction.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM = 5b: LSM ↑
Impact 4.9-4: Impaired emergency access during construction.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM = 5b: LSM ↑
Impact 4.9-5: Temporary disruptions to public transportation, bicycle, and pedestrian facilities during construction.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM = 5b: LSM ↑
Impact 4.9-6: Increased wear-and-tear on the designated haul routes used by construction vehicles.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM = 5b: LSM ↑
Impact 4.9-7: Parking interference during construction.	LSM	NI ↓	LSM ↑	LSM =	LSM =	LSM =	5a: LSM = 5b: LSM ↑
Impact 4.9-8: Long-term traffic increases on regional and local roadways during project operations and maintenance.	LS	NI ↓	LS =	LS =	LS =	LS =	LS =
Impact 4.9-C: Cumulative impacts related to Traffic and Transportation.	SU	NI ↓	SU =	SU =	SU =	SU =	SU =

TABLE ES-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.10: Air Quality							
Impact 4.10-1: Generate emissions of criteria air pollutants and contribute to a violation of an ambient air quality standard during construction.	SU	LSM ↓	SU ↑	SU ↑	SU ↑	SU =	SU =
Impact 4.10-2: Construction activities could conflict with implementation of the applicable air quality plan.	SU	NI ↓	SU ↑	SU ↑	SU ↑	SU =	SU =
Impact 4.10-3: Expose sensitive receptors to substantial pollutant concentrations and/or *Coccidioides immitis* (Valley Fever) spores or create objectionable odors affecting a substantial number of people during construction.	LS	NI ↓	LS ↑	LS ↑	SU ↑	SU ↑	LS =
Impact 4.10-4: Long-term increase of criteria pollutant emissions that could contribute to a violation of an ambient air quality standard during operations.	LS	NI ↓	LS =	LS ↑	LSM ↑	LS ↑	LS ↓
Impact 4.10-5: Expose sensitive receptors to substantial pollutant concentrations or create objectionable odors affecting a substantial number of people during operations.	LS	NI ↓	LS =	LS ↑	LSM ↑	LS ↑	LS ↓
Impact 4.10-C: Cumulative impacts related to Air Quality.	SU	LS ↓	SU ↑	SU ↑	SU ↑	SU ↑	SU =
Section 4.11: Greenhouse Gas Emissions							
Impact 4.11-1: Incremental contribution to climate change from GHG emissions associated with the proposed project.	LSM	LSM ↓	LSM =	LSM =	SU ↑	LSM =	LSM =
Impact 4.11-2: Conflict with the Executive Order B-30-15 Emissions Reduction Goal.	LSM	NI ↓	LSM =	LSM =	SU ↑	LSM =	LSM =
Impact 4.11-3: Conflict with AB 32 Climate Change Scoping Plan.	LSM	NI ↓	LSM =	LSM =	SU ↑	LSM =	LSM =
Impact 4.11-C: Cumulative impacts related to Greenhouse Gas Emissions.	LSM	LS ↓	LSM =	LSM =	SU ↑	LSM =	LSM =
Section 4.12: Noise and Vibration							
Impact 4.12-1: Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity during construction.	SU	NI ↓	SU ↑	SU ↑	SU ↑	SU ↑	5a: SU = 5b: SU ↑

TABLE ES-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.12: Noise and Vibration (cont.)							
Impact 4.12-2: Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during construction.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM = 5b: LSM ↑
Impact 4.12-3: Exposure of people to or generation of excessive groundborne vibration during construction.	LSM	NI ↓	LSM ↓	LSM ↓	LSM ↓	LSM ↓	5a: LSM = 5b: LSM ↓
Impact 4.12-4: Consistency with the construction time limits established by the local jurisdictions.	LSM	NI ↓	LSM =	LSM =	LSM ↑	LSM =	5a: LSM = 5b: LSM ↓
Impact 4.12-5: Substantial permanent increases in ambient noise levels in the project vicinity above levels existing without the project during operations.	LSM	NI ↓	LSM =	LSM =	LSM ↑	LSM ↑	LSM =
Impact 4.12-6: Expose people to or generate operational noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during operation.	LS	NI ↓	LS =	LS =	LS =	LSM ↑	LS =
Impact 4.12-C: Cumulative impacts related to Noise and Vibration.	SU	NI ↓	SU ↑	SU ↑	SU ↑	SU ↑	5a: SU = 5b: SU ↑
Section 4.13: Public Services and Utilities							
Impact 4.13-1: Disrupt or relocate regional or local utilities during construction.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM = 5b: LSM ↑
Impact 4.13-2: Exceed landfill capacity or be out of compliance with federal, state, and local statutes and regulations related to solid waste during construction.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM = 5b: LSM ↑
Impact 4.13-3 Exceed landfill capacity or be out of compliance with federal, state, and local statutes and regulations related to solid waste during operations.	LS	NI ↓	LS =	LS =	LS ↑	LS ↓	LS =

TABLE ES-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.13: Public Services and Utilities (cont.)							
Impact 4.13-4: Exceed wastewater treatment requirements of the Central Coast RWQCB, or result in a determination by the wastewater treatment provider that it has inadequate treatment or outfall capacity to serve the project.	LSM	NI ↓	LSM =	LSM =	LS ↓	LS ↓	LSM =
Impact 4.13-5: Increased corrosion of the MRWPCA outfall and diffuser as a result of brine discharge associated with project operations.	LSM	NI ↓	LSM =	LSM =	NI ↓	NI ↓	LSM =
Impact 4.13-C: Cumulative impacts related to Public Services and Utilities.	LSM	NI ↓	LSM =	LSM =	LSM ↓	LSM ↓	LSM =
Section 4.14: Aesthetic Resources							
Impact 4.14-1: Construction-related impacts on scenic resources (vistas, roadways, and designated scenic areas) or the visual character of the project area and its surroundings.	LS	NI ↓	LS =	LS =	LS =	LSM ↑	LS =
Impact 4.14-2: Temporary sources of substantial light or glare during construction.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	LSM =
Impact 4.14-3: Permanent impacts on scenic resources (vistas, roadways, and designated scenic areas) or the visual character of the project area and its surroundings.	LSM	NI ↓	LSM =	LSM ↓	LSM ↓	LSM =	LSM =
Impact 4.14-4: Permanent new sources of light or glare.	LSM	NI ↓	LSM =	LSM =	LSM ↑	LSM ↑	LSM =
Impact 4.14-C: Cumulative impacts related to Aesthetic Resources	LSM	NI ↓	LSM =	LSM =	LSM =	LSM =	LSM =
Section 4.15: Cultural and Paleontological Resources							
Impact 4.15-1: Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 of the CEQA Guidelines or historic properties pursuant to 36 CFR 800.5 during construction.	NI	NI =	NI =	NI =	NI =	SU ↑	NI =
Impact 4.15-2: Cause a substantial adverse change during construction in the significance of an archaeological resource pursuant to Section 15064.5 of the CEQA Guidelines or historic properties pursuant to 36 CFR 800.5.	LSM	LSM ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM = 5b: LSM ↑
Impact 4.15-3: Directly or indirectly destroy a unique paleontological resource or site, or unique geological feature during construction.	LS	NI ↓	LS ↑	LS ↑	LS ↑	LS ↑	5a: LS = 5b: LS ↑

TABLE ES-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.15: Cultural and Paleontological Resources (cont.)							
Impact 4.15-4: Disturbance any human remains, including those interred outside of formal cemeteries, during construction.	**LSM**	**NI ↓**	**LSM ↑**	**LSM ↑**	**LSM ↑**	**LSM ↑**	**5a: LSM = 5b: LSM ↑**
Impact 4.15-C: Cumulative impacts related to Cultural and Paleontological Resources.	**LS**	**LS ↓**	**LS =**	**LSM ↑**	**LSM ↑**	**LSM ↑**	**LSM =**
Section 4.16: Agricultural Resources							
Impact 4.16-1: Result in changes in the existing environment that, due to their location or nature, could temporarily disrupt agricultural activities or result in the permanent conversion of farmland to non-agricultural use.	**LSM**	**NI ↓**	**LSM =**	**LSM =**	**LSM ↑**	**NI ↓**	**LSM =**
Impact 4.16-2: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use.	**LS**	**NI ↓**	**LS =**	**LS =**	**LS ↑**	**NI ↓**	**LS =**
Impact 4.16-3: Conflict with zoning for agricultural uses or with Williamson Act contracts.	**LS**	**NI ↓**	**LS =**	**LS =**	**LS ↑**	**NI ↓**	**LS =**
Impact 4.16-C: Cumulative impacts related to Agricultural Resources.	**LSM**	**NI ↓**	**LSM =**	**LSM =**	**LSM ↑**	**NI ↓**	**LSM =**
Section 4.17: Mineral Resources							
Impact 4.17-1: Loss of availability of known mineral resources that are of value to the region or residents of the state or result in the loss of a locally-recognized important mineral resource recovery site.	**LS**	**NI ↓**	**LS ↓**	**LS ↓**	**LS ↓**	**LS ↓**	**5a: LS = 5b: LS ↓**
Impact 4.17-C: Cumulative impacts related to Mineral Resources.	**LS**	**NI ↓**	**LS ↓**	**LS ↓**	**LS ↓**	**LS ↓**	**5a: LS = 5b: LS ↓**

TABLE ES-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.18: Energy Conservation							
Impact 4.18-1: Use large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during construction.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM ↓ 5b: LSM ↑
Impact 4.18-2: Use large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during operations.	LS	NI ↓	LS ↑	LS ↑	LS ↑	LS ↑	LS ↓
Impact 4.18-3: Constrain local or regional energy supplies, require additional capacity, or affect peak and base periods of electrical demand during operations.	LS	NI ↓	LS ↑	LS ↑	SU ↑	LS ↑	LS ↓
Impact 4.18-C: Cumulative impacts related to Energy Resources.	LSM	NI ↓	LSM ↑	LSM ↑	SU ↑	LSM ↑	5a: LSM ↓ 5b: LSM ↓
Section 4.19: Population and Housing							
Impact 4.19-1: Induce substantial population growth directly during project construction.	LS	NI ↓	LS =	LS =	LS =	LS =	LS =
Impact 4.19-2: Induce substantial population growth directly during project operations.	LS	NI ↓	LS =	LS =	LS =	LS =	LS =
Impact 4.19-C: Cumulative impacts related to Population and Housing.	LS	NI ↓	LS =	LS =	LS =	LS =	LS =
Section 4.20 Socioeconomics and Environmental Justice							
Impact 4.20-1: Reductions in the rate of employment, total income, or business activity in Monterey County.	LSM	SU ↑	LSM =	LSM =	LSM =	LSM =	LSM =
Impact 4.20-2: Disproportionately high and adverse effects on low-income or minority populations.	LS	SU ↑	LS =	LS ↓	SU ↑	SU ↑	LS ↓
Impact 4.20-C: Cumulative impacts related to Socioeconomics and/or Environmental Justice.	LSM	SU ↑	LSM =	LSM =	SU ↑	SU ↑	LSM ↓

TABLE ES-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Growth Inducement							
Impact 6.3-1: Secondary effects of planned growth.	SU	NI ↓	LS ↓	SU ↑	SU ↑	SU ↑	LS ↓
Impact 6.3-C: Cumulative impacts related to growth inducement.	SU	NI ↓	SU ↑	SU ↑	SU ↑	SU ↑	SU =

NOTES:

↑ Increased severity of impact ↓ Decreased severity of impact = Same severity of impact

NI – No Impact
LS = Less than Significant impact, no mitigation proposed
LSM = Less than Significant impact with Mitigation
SU = Significant and Unavoidable impact, even with implementation of mitigation
= Beneficial Impact

TABLE ES-2
SUMMARY OF IMPACTS AND MITIGATION MEASURES – MPWSP PROPOSED PROJECT

IMPACT	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water PL	Brine Discharge PL	PL to CSIP Pond	New Desalinated Water PL	Castroville PL	New Transmission Main	ASR-5 and ASR-6 Wells	ASR Conveyance PL, ASR Pump-to-Waste PL, ASR Recirculation PL	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Carmel Valley Pump Station	Staging Areas	Overall Impact Significance Determination for Proposed Project
Section 4.2: Geology, Soils, and Seismicity															
Impact 4.2-1: Substantial soil erosion or loss of topsoil during construction.	LS	LS	LSM	LS	LS	LSM	LSM	LS	LSM	LS	LS	LS	LSM		**LSM**
Mitigation Measures															
4.6-2b: Avoid, Minimize, and Compensate for Direct Construction Impacts on Sensitive Communities.	-	-	X	-	-	X	X	-	X	-	-	-	X		
4.16-1: Minimize Disturbance to Farmland	-	-	X	-	-	X	X	-	-	-	-	-	-		
Impact 4.2-2: Exposure of people or structures to substantial adverse effects related to fault rupture.	NI	NI	NI	NI	NI	NI	NI	LS	NI	NI	LS	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.2-3: Exposure of people or structures to substantial adverse effects related to seismically-induced groundshaking.	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.2-4: Exposure of people or structures to substantial adverse effects related to seismically-induced ground failure, including liquefaction, lateral spreading, or settlement.	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.2-5: Exposure of people or structures to substantial adverse effects related to landslides or other slope failures.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	LS	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.2-6: Exposure of people or structures to substantial adverse effects related to expansive soils.	NI	NI	NI	NI	NI	NI	LS	NI	NI	NI	LS	LS	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.2-7: Exposure of structures to substantial adverse effects related to corrosive soils.	NI	LS	NI	NI	NI	NI	NI	NI	LS	LS	LS	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-			
Impact 4.2-8: Exposure of people or structures to substantial adverse effects related to land subsidence.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		**NI**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.2-9: Exposure of people or structures to substantial adverse effects related to alternative wastewater disposal systems.	LS	NI	NI	NI	NI	NI	NI	NI	LS	NI	NI	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		

TABLE ES-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES – MPWSP PROPOSED PROJECT

IMPACT	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water PL	Brine Discharge PL	PL to CSIP Pond	New Desalinated Water PL	Castroville PL	New Transmission Main	ASR-5 and ASR-6 Wells	ASR Conveyance PL, ASR Pump-to-Waste PL, ASR Recirculation PL	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Carmel Valley Pump Station	Staging Areas	Overall Impact Significance Determination for Proposed Project
Section 4.2: Geology, Soils, and Seismicity (cont.)															
Impact 4.2-10: Accelerate and/or exacerbate natural rates of coastal erosion, scour, or dune retreat, resulting in damage to adjoining properties or a substantial change in the natural coastal environment.	LSM	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		**LSM**
Mitigation Measures															
4.2-9: Slant Well Abandonment Plan.	X	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.2.11: Degrades the physical structure of any geologic resource or alters any oceanographic process, such as sediment transport, that is measurably different from pre-existing conditions.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		**NI**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.2-C: Cumulative impacts related to Geology, Soils, and Seismicity.	**LSM for cumulative impacts associated with soil erosion or loss of topsoil during construction, and for cumulative impacts associated with coastal erosion and bluff retreat.**														
Section 4.3: Surface Water Hydrology and Water Quality															
Impact 4.3-1: Degradation of water quality associated with increased soil erosion and inadvertent releases of hazardous chemicals during general construction activities.	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.3-2: Degradation of water quality from construction-related discharges of dewatering effluent from open excavations and water produced during well drilling and development.	LS	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LS	LSM	LSM	LSM	LSM		**LSM**
Mitigation Measures															
4.7-2b: Soil and Groundwater Management Plan.	-	X	X	X	X	X	X	X	-	X	X	X	X		
Impact 4.3-3: Degradation of water quality from discharges of treated water and disinfectant from existing and newly installed pipelines during construction.	NI	NI	LS	LS	LS	LS	LS	LS	NI	LS	LS	LS	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.3-4: Violate water quality standards or waste discharge requirements or degrade water quality from increased salinity as a result of brine discharge from the operation of the MPWSP Desalination Plant.	NI	LSM	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		**LSM**
Mitigation Measures															
4.3-4: Operational Discharge Monitoring, Analysis, Reporting, and Compliance	-	X	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.3-5: Violate water quality standards or waste discharge requirements or degrade water quality as a result of brine discharge from the operation of the MPWSP Desalination Plant.	NI	LSM	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		**LSM**
Mitigation Measures															
4.3-5: Implement Protocols to Avoid Exceeding Water Quality Objectives	-	X	-	-	-	-	-	-	-	-	-	-	-		

TABLE ES-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES – MPWSP PROPOSED PROJECT

IMPACT	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water PL	Brine Discharge PL	PL to CSIP Pond	New Desalinated Water PL	Castroville PL	New Transmission Main	ASR-5 and ASR-6 Wells	ASR Conveyance PL, ASR Pump-to-Waste PL, ASR Recirculation PL	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Carmel Valley Pump Station	Staging Areas	Overall Impact Significance Determination for Proposed Project
Section 4.3: Surface Water Hydrology and Water Quality (cont.)															
Impact 4.3-6: Degradation of water quality due to discharges associated with maintenance of the subsurface slant wells and the ASR -5 and ASR-6 Wells.	LS	NI	NI	NI	NI	NI	NI	NI	LS	NI	NI	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.3-7: Alteration of drainage patterns such that there is a resultant increase in erosion, siltation, or the rate or amount of surface runoff.	LS	LS	NI	NI	NI	NI	NI	NI	LS	NI	NI	NI	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.3-8: Alteration of drainage patterns such that there is an increase in flooding on- or offsite or the capacity of the stormwater drainage system is exceeded.	LS	LS	NI	NI	NI	NI	NI	NI	LS	NI	NI	NI	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.3-9: Impedance or redirection of flood flows due to the siting of project facilities in a 100-year flood hazard area.	LS	NI	LS	NI	NI	NI	LS	LS	NI	NI	NI	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.3-10: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to a tsunami.	LS	NI	NI	NI	NI	NI	LS	NI	NI	NI	NI	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.3-11: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise.	LS	LS	LS	NI	NI	NI	LS	NI	NI	NI	NI	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.3-C: Cumulative impacts related to Surface Water Hydrology and Water Quality.	**LSM for cumulative impacts associated with surface water quality during construction, and ocean water quality during operation.**														
Section 4.4: Groundwater Resources															
Impact 4.4-1: Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level during construction.	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.4-2: Violate any water quality standards or otherwise degrade groundwater quality during construction.	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		

TABLE ES-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES – MPWSP PROPOSED PROJECT

IMPACT	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water PL	Brine Discharge PL	PL to CSIP Pond	New Desalinated Water PL	Castroville PL	New Transmission Main	ASR-5 and ASR-6 Wells	ASR Conveyance PL, ASR Pump-to-Waste PL, ASR Recirculation PL	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Carmel Valley Pump Station	Staging Areas	Overall Impact Significance Determination for Proposed Project
Section 4.4: Groundwater Resources (cont.)															
Impact 4.4-3: Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level during operations so as to expose well screens and pumps.	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS		**LS**
Applicant Proposed Measure															
4.4-3: Groundwater Monitoring and Avoidance of Well Damage.	X	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.4-4: Violate any water quality standards or otherwise degrade groundwater quality during operations.	LSM	NI	NI	NI	NI	NI	NI	NI	LS	NI	NI	NI	NI		**LSM**
Mitigation Measures															
4.4-4: Groundwater Monitoring and Avoidance of Impacts on Groundwater Remediation Plumes.	X	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.4-C: Cumulative impacts related to Groundwater Resources.	**LS**														
Section 4.5: Marine Resources															
Impact 4.5-1: Result in a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any marine species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH); or as identified by the CDFW, USFWS, and/or NMFS during construction	LS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.5-2: Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels during construction.	LS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.5-3: Interfere substantially with the movement of any native marine resident or migratory fish or marine wildlife species or with established native resident or migratory marine wildlife corridors, or impede the use of native marine wildlife nursery sites during construction.	LS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.5-4: Result in a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any marine species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH); or as identified by the CDFW, USFWS, and/or NMFS during operations.	LS	LS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.5-5: Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels during operations.	LS	LS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		

TABLE ES-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES – MPWSP PROPOSED PROJECT

IMPACT	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water PL	Brine Discharge PL	PL to CSIP Pond	New Desalinated Water PL	Castroville PL	New Transmission Main	ASR-5 and ASR-6 Wells	ASR Conveyance PL, ASR Pump-to-Waste PL, ASR Recirculation PL	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Carmel Valley Pump Station	Staging Areas	Overall Impact Significance Determination for Proposed Project
Section 4.5: Marine Resources (cont.)															
Impact 4.5 6: Interfere substantially with the movement of any native marine resident or migratory fish or marine wildlife species or with established native resident or migratory marine wildlife corridors, or impede the use of native marine wildlife nursery sites during operations.	LS	LS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Impact 4.5-C: Cumulative impacts on Marine Resources.	**LS**														
Section 4.6: Terrestrial Biological Resources															
Impact 4.6-1: Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification, during construction.	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	**LSM**
Mitigation Measures															
4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
4.6-1b: Construction Worker Environmental Awareness Training and Education Program.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
4.6-1c: General Avoidance and Minimization Measures.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
4.6-1d: Protective Measures for Western Snowy Plover.	X	-	X	-	-	-	-	-	-	-	-	-	-	-	
4.6-1e: Avoidance and Minimization Measures for Special-status Plants.	X	X	X	-	-	X	X	X	X	X	X	X	-	X	
4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly.	X	-	X	-	-	X	-	X	-	-	-	-	-	X	
4.6-1g: Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard.	X	-	X	-	-	X	X	X	X	X	-	-	-	X	
4.6-1h: Avoidance and Minimization Measures for Western Burrowing Owl.	-	-	X	-	-	X	-	X	-	-	-	-	-	X	
4.6-1i: Avoidance and Minimization Measures for Nesting Birds.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
4.6-1j: Avoidance and Minimization Measures for American Badger.	-	X	X	-	-	X	X	X	X	X	X	X	-	X	
4.6-1k: Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat.	-	-	-	-	-	-	-	X	X	X	X	X	X	X	
4.6-1l: Avoidance and Minimization Measures for Special-status Bats.	-	X	X	X	X	X	X	X	X	X	X	X	X	X	
4.6-1m: Avoidance and Minimization Measures for Native Stands of Monterey Pine.	-	-	-	-	-	-	-	-	X	X	X	X	X	-	
4.6-1n: Habitat Mitigation and Monitoring Plan.	X	X	X	-	-	X	X	X	X	X	X	X	X	X	
4.6-1o: Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander.	-	X	X	X	X	X	X	-	-	-	X	X	X	X	
4.6-1p: Control Measures for Spread of Invasive Plants	X	X	X	-	-	X	X	X	X	X	-	-	-	X	
4.6-1q: Frac-out Contingency Plan	-	-	-	-	-	-	X	-	-	-	-	-	-	-	
4.12-1b: General Noise Controls for Construction Equipment.	X	-	X	-	-	-	-	-	-	-	-	-	-	-	
4.14-2: Site-Specific Construction Lighting Measures.	X	X	X	X	X	X	X	X	X	X	-	-	-	-	

TABLE ES-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES – MPWSP PROPOSED PROJECT

IMPACT	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water PL	Brine Discharge PL	PL to CSIP Pond	New Desalinated Water PL	Castroville PL	New Transmission Main	ASR-5 and ASR-6 Wells	ASR Conveyance PL, ASR Pump-to-Waste PL, ASR Recirculation PL	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Carmel Valley Pump Station	Staging Areas	Overall Impact Significance Determination for Proposed Project
Section 4.6: Terrestrial Biological Resources (cont.)															
Impact 4.6-2: Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during construction.	LSM	LSM	LSM	LS	LS	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	**LSM**
Mitigation Measures															
4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.	X	X	X	-	-	X	X	X	X	X	X	X	X	X	
4.6-1b: Construction Worker Environmental Awareness Training and Education Program.	X	X	X	-	-	X	X	X	X	X	X	X	X	X	
4.6-1c: General Avoidance and Minimization Measures.	X	X	X	-	-	X	X	X	X	X	X	X	X	X	
4.6-1d: Protective Measures for Western Snowy Plover.	X	-	X	-	-	-	-	-	-	-	-	-	-	-	
4.6-1e: Avoidance and Minimization Measures for Special-status Plants.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1n: Habitat Mitigation and Monitoring Plan.	X	X	X	-	-	X	X	X	X	X	X	X	X	X	
4.6-1o: Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander.	-	-	-	-	-	-	-	-	-	-	-	X	X	-	
4.6-1p: Control Measures for Spread of Invasive Plants	X	X	X	-	-	X	X	X	X	X	-	-	-	-	
4.6-1q: Frac-out Contingency Plan	-	-	-	-	-	-	X	-	-	-	-	-	-	-	
4.6-2a: Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas.	X	--	X	-	-	X	X	X	-	-	-	-	-	X	
4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas.	X	X	X	-	-	X	X	X	X	X	X	X	X	X	
Impact 4.6-3: Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the State during construction.	LSM	LS	LSM	LSM	LSM	LSM	LSM	LSM	LS	LS	LSM	LSM	LSM	LS	**LSM**
Mitigation Measures															
4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.	X	-	X	X	X	X	X	X	-	-	X	X	X	-	
4.6-1b: Construction Worker Environmental Awareness Training and Education Program.	X	-	X	X	X	X	X	X	-	-	X	X	X	-	
4.6-1c: General Avoidance and Minimization Measures.	X	-	X	X	X	X	X	X	-	-	X	X	X	-	
4.6-1q: Frac-out Contingency Plan	-	-	-	-	-	-	X	-	-	-	-	-	-	-	
4.6-3: Avoid, Minimize, and or Mitigate Impacts to Wetlands.	-	-	-	-	-	X	X	-	-	-	X	X	X	-	
Impact 4.6-4: Be inconsistent with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance with local tree ordinances.	SU	LSM	SU	LSM	LSM	SU	LSM	SU	LSM	LSM	LSM	LSM	LSM	SU	**SU**
Mitigation Measures															
4.6-1n: Habitat Mitigation and Monitoring Plan.	X	-	X	-	-	X	-	X	-	-	-	-	-	X	
4.6-4: Compliance with Local Tree Ordinances.	-	X	X	X	X	X	X	X	X	X	X	X	X	-	
Impact 4.6-5: Introduce or spread an invasive non-native species during construction.	LSM	LSM	LSM	NI	NI	LSM	LSM	LSM	LSM	LSM	NI	NI	NI	NI	**LSM**
Mitigation Measures															
4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.	X	X	X	-	-	X	X	X	X	X	-	-	-	-	
4.6-1p: Control Measures for Spread of Invasive Plants.	X	X	X	-	-	X	X	X	X	X	-	-	-	-	

TABLE ES-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES – MPWSP PROPOSED PROJECT

IMPACT	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water PL	Brine Discharge PL	PL to CSIP Pond	New Desalinated Water PL	Castroville PL	New Transmission Main	ASR-5 and ASR-6 Wells	ASR Conveyance PL, ASR Pump-to-Waste PL, ASR Recirculation PL	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Carmel Valley Pump Station	Staging Areas	Overall Impact Significance Determination for Proposed Project
Section 4.6: Terrestrial Biological Resources (cont.)															
Impact 4.6-6: Result in substantial adverse effects on candidate, sensitive, or special-status species during project operations.	LSM	LSM	NI	NI	NI	NI	NI	NI	LSM	NI	NI	LSM	LSM	NI	**LSM**
Mitigation Measures															
4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1b: Construction Worker Environmental Awareness Training and Education Program.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1c: General Avoidance and Minimization Measures.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1d: Protective Measures for Western Snowy Plover.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1e: Avoidance and Minimization Measures for Special-status Plants.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1g: Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1i: Avoidance and Minimization Measures for Nesting Birds.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1n: Habitat Mitigation and Monitoring Plan.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1p: Control Measures for Spread of Invasive Plants.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-6: Installation and Monitoring of Bird Deterrents at the Brine Storage Basin.	-	X	-	-	-	-	-	-	-	-	-	-	-	-	
4.12-1b: General Noise Controls for Construction Equipment.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.12-5: Stationary Source Noise Controls.	-	-	-	-	-	-	-	-	X	-	-	X	-	-	
4.14-2: Site-Specific Nighttime Lighting Measures.	X	-	-	-	-	-	-	-	-	-	-	-	X	-	
Impact 4.6-7: Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during project operations	LSM	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	**LSM**
Mitigation Measures															
4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1b: Construction Worker Environmental Awareness Training and Education Program.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1c: General Avoidance and Minimization Measures.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1d: Protective Measures for Western Snowy Plover	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1n: Habitat Mitigation and Monitoring Plan.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1p: Control Measures for Spread of Invasive Plants	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-2a: Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-2b: Avoid, Minimize, and Compensate for Direct Construction Impacts to Sensitive Communities.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	

TABLE ES-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES – MPWSP PROPOSED PROJECT

IMPACT	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water PL	Brine Discharge PL	PL to CSIP Pond	New Desalinated Water PL	Castroville PL	New Transmission Main	ASR-5 and ASR-6 Wells	ASR Conveyance PL, ASR Pump-to-Waste PL, ASR Recirculation PL	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Carmel Valley Pump Station	Staging Areas	Overall Impact Significance Determination for Proposed Project
Section 4.6: Terrestrial Biological Resources (cont.)															
Impact 4.6-8: Result in substantial adverse effects on federal wetlands, federal other waters, and waters of the State during project operations.	LSM	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	**LSM**
Mitigation Measures															
4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1b: Construction Worker Environmental Awareness Training and Education Program.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1c: General Avoidance and Minimization Measures.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
Impact 4.6-9: Introduce or spread an invasive non-native species during project operations.	LSM	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	**LSM**
Mitigation Measures															
4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.6-1p: Control Measures for Spread of Invasive Plants.	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
Impact 4.6-10: Conflict with the provisions of an adopted Habitat Conservation Plans, natural community conservation plans or other approved local, regional, or state habitat conservation plan.	NI	NI	NI	NI	NI	NI	NI	LSM	NI	NI	NI	NI	NI	NI	**LSM**
Mitigation Measures															
4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.								X							
4.6-1n: Habitat Mitigation and Monitoring Plan.	-	-	-	-	-	-	-	X	-	-	-	-	-	-	
4.6-2b: Avoid, Minimize, and Compensate for Direct Construction Impacts to Sensitive Communities.	-	-	-	-	-	-	-	X	-	-	-	-	-	-	
4.6-8: Management Requirements within Borderland Development Areas along Natural Resource Management Area Interface.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Impact 4.6-C: Cumulative impacts related to Terrestrial Biological Resources.	**SU for cumulative impacts associated with inconsistencies with local policies or ordinances protecting biological resources.**														
	LSM for cumulative impacts associated with all other project impacts.														
Section 4.7: Hazards and Hazardous Materials															
Impact 4.7-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials during construction.	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.7-2: Encountering hazardous materials from other hazardous materials release sites during construction.	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM		**LSM**
Mitigation Measures															
4.7-2a: Health and Safety Plan.	X	X	X	X	X	X	X	X	X	X	X	X	X		
4.7-2b: Soil and Groundwater Management Plan.	X	X	X	X	X	X	X	X	X	X	X	X	X		

TABLE ES-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES – MPWSP PROPOSED PROJECT

IMPACT	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water PL	Brine Discharge PL	PL to CSIP Pond	New Desalinated Water PL	Castroville PL	New Transmission Main	ASR-5 and ASR-6 Wells	ASR Conveyance PL, ASR Pump-to-Waste PL, ASR Recirculation PL	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Carmel Valley Pump Station	Staging Areas	Overall Impact Significance Determination for Proposed Project
Section 4.7: Hazards and Hazardous Materials (cont.)															
Impact 4.7-3: Project facilities would be located on a known hazardous materials site.	NI	NI	NI	NI	NI	NI	NI	LS	NI	NI	NI	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.7-4: Handle hazardous materials or emit hazardous emissions within 0.25 mile of schools during construction.	NI	NI	NI	NI	NI	LS	NI	LS	NI	LS	LS	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.7-5: Increase risk of wildland fires during construction.	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.7-6: Create a significant hazard to the public or the environment through the routine transport, use, disposal, or accidental release of hazardous materials during project operations.	LS	LS	NI	NI	NI	NI	NI	NI	LS	NI	NI	NI	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.7-C: Cumulative impacts related to Hazards and Hazardous Materials.	**LSM for cumulative impacts associated with the potential to encounter hazardous materials during construction.**														
Section 4.8: Land Use, Land Use Planning, and Recreation															
Impact 4.8-1: Consistency with applicable plans, policies, and regulations related to land use and recreation that were adopted for the purpose of mitigating an environmental effect.	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.8-2: Disrupt or preclude public access to or along the coast during construction.	LS	NI	NI	NI	NI	NI	NI	LSM	NI	NI	NI	NI	NI		**LSM**
Mitigation Measures															
4.9-1: Traffic Control and Safety Assurance Plan.	-	-	-	-	-	-	-	X	-	-	-	-	-		
Impact 4.8-C: Cumulative impacts related to Land Use, Land Use Planning, and Recreation.	**LS**														
Section 4.9: Traffic and Transportation															
Impact 4.9-1: Temporary traffic increases on regional and local roadways due to construction-related vehicle trips.	LS	LS	LS	LS	LS	LS	LS	LSM	LSM	LSM	LSM	LSM	LS		**LSM**
Mitigation Measures															
4.9-1: Traffic Control and Safety Assurance Plan.	-	-	-	-	-	-	-	X	X	X	X	X	-		
Impact 4.9-2: Temporary reduction in roadway capacities and increased traffic delays during construction.	LS	LS	LSM	LSM	LSM	LSM	LSM	LSM	LS	LSM	LSM	LSM	LS		**LSM**
Mitigation Measures															
4.9-1: Traffic Control and Safety Assurance Plan.	-	-	X	X	X	X	X	X	-	X	X	X	-		

TABLE ES-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES – MPWSP PROPOSED PROJECT

IMPACT	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water PL	Brine Discharge PL	PL to CSIP Pond	New Desalinated Water PL	Castroville PL	New Transmission Main	ASR-5 and ASR-6 Wells	ASR Conveyance PL, ASR Pump-to-Waste PL, ASR Recirculation PL	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Carmel Valley Pump Station	Staging Areas	Overall Impact Significance Determination for Proposed Project
Section 4.9: Traffic and Transportation (cont.)															
Impact 4.9-3: Increased traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways during construction.	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM		**LSM**
Mitigation Measures															
4.9-1: Traffic Control and Safety Assurance Plan.	X	X	X	X	X	X	X	X	X	X	X	X	X		
Impact 4.9-4: Impaired emergency access during construction.	LS	LS	LSM	LSM	LSM	LSM	LSM	LSM	LS	LSM	LSM	LSM	LS	LS	**LSM**
Mitigation Measures															
4.9-1: Traffic Control and Safety Assurance Plan.	-	-	X	X	X	X	X	X	-	X	X	X	-	-	
Impact 4.9-5: Temporary disruptions to public transportation, bicycle, and pedestrian facilities during construction.	NI	NI	LSM	NI	NI	LSM	LSM	LSM	NI	NI	NI	NI	NI		**LSM**
Mitigation Measures															
4.9-1: Traffic Control and Safety Assurance Plan.	-	-	X	-	-	X	X	X	-	-	-	-	-		
Impact 4.9-6: Increased wear-and-tear on the designated haul routes used by construction vehicles.	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM		**LSM**
Mitigation Measures															
4.9-6: Roadway Rehabilitation Program.	X	X	X	X	X	X	X	X	X	X	X	X	X		
Impact 4.9-7: Parking interference during construction.	NI	NI	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LSM	**LSM**
Mitigation Measures															
4.9-7: Construction Parking Requirements.	-	-	-	-	-	-	-	-	-	-	-	-	-	X	
Impact 4.9-8: Long-term traffic increases on regional and local roadways during project operations and maintenance.	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.9-C: Cumulative impacts related to Traffic and Transportation.	**SU for cumulative impacts associated with traffic during construction.**														
Mitigation Measure 4.9-C: Construction Traffic Coordination Plan.	**X**														
Section 4.10: Air Quality															
Impact 4.10-1: Generate emissions of criteria air pollutants and contribute to a violation of an ambient air quality standard during construction.	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU		**SU**
Mitigation Measures															
4.10-1a: Equipment with High-Tiered Engine Standards.	X	X	X	X	X	X	X	X	X	X	X	X	X		
4.10-1b: Idling Restrictions.	X	X	X	X	X	X	X	X	X	X	X	X	X		
4.10-1c: Construction Fugitive Dust Control Plan.	X	X	X	X	X	X	X	X	X	X	X	X	X		
4.10-1e: Off-site Mitigation Program	X	X	X	X	X	X	X	X	X	X	X	X	X		

TABLE ES-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES – MPWSP PROPOSED PROJECT

IMPACT	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water PL	Brine Discharge PL	PL to CSIP Pond	New Desalinated Water PL	Castroville PL	New Transmission Main	ASR-5 and ASR-6 Wells	ASR Conveyance PL, ASR Pump-to-Waste PL, ASR Recirculation PL	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Carmel Valley Pump Station	Staging Areas	Overall Impact Significance Determination for Proposed Project
Section 4.10: Air Quality (cont.)															
Impact 4.10-2: Construction activities could conflict with implementation of the applicable air quality plan.	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU	SU		**SU**
Mitigation Measures															
4.10-1a: Equipment with High-Tiered Engine Standards.	X	X	X	X	X	X	X	X	X	X	X	X	X		
4.10-1b: Idling Restrictions.	X	X	X	X	X	X	X	X	X	X	X	X	X		
Impact 4.10-3: Expose sensitive receptors to substantial pollutant concentrations and/or *Coccidioides immitis* (Valley Fever) spores or create objectionable odors affecting a substantial number of people during construction.	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.10-4: Long-term increase of criteria pollutant emissions that could contribute to a violation of an ambient air quality standard during operations.	LS	LS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.10-5: Expose sensitive receptors to substantial pollutant concentrations or create objectionable odors affecting a substantial number of people during operations.	NI	LS	NI	NI	NI	NI	NI	NI	LS	NI	NI	NI	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.10-C: Cumulative impacts related to Air Quality.	**SU for cumulative impacts associated with air quality standards during construction.**														
Section 4.11: Greenhouse Gas Emissions															
Impact 4.11-1: Incremental contribution to climate change from GHG emissions associated with the proposed project.	**LSM**														
Mitigation Measures															
4.11-1: GHG Emissions Reductions Plan.	**X**														
4.18-1: Construction Equipment and Vehicle Efficiency Plan.	X	X	X	X	X	X	X	X	X	X	X	X	X		
Impact 4.11-2: Conflict with the Executive Order B-30-15 Emissions Reduction Goal.	**LSM**														
Mitigation Measures															
4.11-1: GHG Emissions Reduction Plan.	**X**														
4.18-1: Construction Equipment Efficiency Plan.	X	X	X	X	X	X	X	X	X	X	X	X	X		
Impact 4.11-3: Conflict with AB 32 Climate Change Scoping Plan.	**LSM**														
Mitigation Measures															
4.11-1: GHG Emissions Reduction Plan.	**X**														
Impact 4.11-C: Cumulative impacts related to Greenhouse Gas Emissions.	**LSM**														

TABLE ES-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES – MPWSP PROPOSED PROJECT

IMPACT	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water PL	Brine Discharge PL	PL to CSIP Pond	New Desalinated Water PL	Castroville PL	New Transmission Main	ASR-5 and ASR-6 Wells	ASR Conveyance PL, ASR Pump-to-Waste PL, ASR Recirculation PL	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Carmel Valley Pump Station	Staging Areas	Overall Impact Significance Determination for Proposed Project
Section 4.12: Noise and Vibration															
Impact 4.12-1: Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity during construction.	LS	LS	LS	LS	LS	LSM	SU	LSM	SU	LS	LS	LS	LSM		**SU**
Mitigation Measures															
4.12-1a: Neighborhood Notice and Construction Disturbance Coordinator.	-	-	-	-	-	X	X	X	X	-	-	-	X		
4.12-1b: General Noise Controls for Construction Equipment and Activities.	-	-	-	-	-	X	X	X	X	-	-	-	X		
4.12-1c: Noise Control Plan for Nighttime Pipeline Construction.	-	-	-	-	-	X	X	X	-	-	-	-	-		
4.12-1d: Additional Noise Controls for ASR-5 and ASR-6 Wells.	-	-	-	-	-	-	-	-	X	-	-	-	-		
4.12-1e: Offsite Accommodations for Substantially Affected Nighttime Receptors.	-	-	-	-	-	-	-	-	X	-	-	-	-		
Impact 4.12-2: Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during construction.	LS	LS	LS	LS	LS	LSM	LSM	LSM	NI	LSM	LS	LS	LS		**LSM**
Mitigation Measures															
4.12-1b: General Noise Controls for Construction Equipment.	-	-	-	-	-	X	X	X	-	X	-	-	-		
4.12-1c: Noise Control Plan for Nighttime Pipeline Construction.	-	-	-	-	-	X	X	X	-	-	-	-	-		
Impact 4.12-3: Exposure of people to or generation of excessive groundborne vibration during construction.	LS	LS	LSM	LS	LS	LSM	LSM	LSM	LS	LS	LS	LS	LS		**LSM**
Mitigation Measures															
4.12-3: Vibration Reduction Measures.	-	-	-	-	-	X	X	X	-	-	-	-	-		
Impact 4.12-4: Consistency with the construction time limits established by the local jurisdictions.	NI	NI	NI	NI	NI	LSM	NI	LSM	LSM	NI	NI	NI	NI		**LSM**
Mitigation Measures															
4.12-1c: Noise Control Plan for Nighttime Pipeline Construction.	-	-	-	-	-	-	-	-	X	-	-	-	-		
4.12-4: Nighttime Construction Restrictions in Marina.						X		X							
Impact 4.12-5: Substantial permanent increases in ambient noise levels in the project vicinity above levels existing without the project during operations.	LS	LS	NI	NI	NI	NI	NI	NI	LSM	NI	LS	LSM	LS		**LSM**
Mitigation Measures															
4.12-5: Stationary-Source Noise Controls.	-	-	-	-	-	-	-	-	X	-	-	X	-		
Impact 4.12-6: Expose people to or generate operational noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during operation.	LS	LS	LS	LS	LS	LS	NI	LS	NI	LS	LS	LS	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.12-C: Cumulative impacts related to Noise and Vibration	**SU for cumulative impacts associated with nighttime noise impacts during construction.**														
	LSM for cumulative impacts associated with construction-related vibration.														

TABLE ES-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES – MPWSP PROPOSED PROJECT

IMPACT	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water PL	Brine Discharge PL	PL to CSIP Pond	New Desalinated Water PL	Castroville PL	New Transmission Main	ASR-5 and ASR-6 Wells	ASR Conveyance PL, ASR Pump-to-Waste PL, ASR Recirculation PL	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Carmel Valley Pump Station	Staging Areas	Overall Impact Significance Determination for Proposed Project
Section 4.13: Public Services and Utilities															
Impact 4.13-1: Disrupt or relocate regional or local utilities during construction.	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM		**LSM**
Mitigation Measures															
4.13-1a: Locate and Confirm Utility Lines.	X	X	X	X	X	X	X	X	X	X	X	X	X		
4.13-1b: Coordinate Final Construction Plans with Affected Utilities.	X	X	X	X	X	X	X	X	X	X	X	X	X		
4.13-1c: Safeguard Employees from Potential Accidents Related to Underground Utilities.	X	X	X	X	X	X	X	X	X	X	X	X	X		
4.13-1d: Emergency Response Plan.	X	X	X	X	X	X	X	X	X	X	X	X	X		
4.13-1e: Notify Local Fire Departments.	X	X	X	X	X	X	X	X	X	X	X	X	X		
4.13-1f: Ensure Prompt Reconnection of Utilities.	X	X	X	X	X	X	X	X	X	X	X	X	X		
Impact 4.13-2: Exceed landfill capacity or be out of compliance with federal, state, and local statutes and regulations related to solid waste during construction.	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM		**LSM**
Mitigation Measures															
4.13-2: Construction Waste Reduction and Recycling Plan.	X	X	X	X	X	X	X	X	X	X	X	X	X		
Impact 4.13-3 Exceed landfill capacity or be out of compliance with federal, state, and local statutes and regulations related to solid waste during operations.	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.13-4: Exceed wastewater treatment requirements of the Central Coast RWQCB, or result in a determination by the wastewater treatment provider that it has inadequate treatment or outfall capacity to serve the project.	NI	LSM	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		**LSM**
Mitigation Measures															
4.3-4: Operational Discharge Monitoring, Analysis, Reporting, and Compliance.	-	X	-	-	-	-	-	-	-	-	-	-	-		
4.3-5: Implement Protocols to Avoid Exceeding Water Quality Objectives.	-	X	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.13-5: Increased corrosion of the MRWPCA outfall as a result of brine discharge associated with project operations.	NI	LSM	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		**LSM**
Mitigation Measures															
4.13-5a: Replacement of WEKO Seal Clamps, Periodic Inspections and As-Needed Repairs for Offshore Segment of MRWPCA Ocean Outfall.	-	X	-	-	-	-	-	-	-	-	-	-	-		
4.13-5b: Install Protective Lining in Land Segment of MRWPCA Ocean Outfall	-	X	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.13-C: Cumulative impacts related to Public Services and Utilities.	**LSM for cumulative impacts related to wastewater treatment requirement and corrosion of the MRWPCA outfall and diffuser during operations.**														
Section 4.14: Aesthetic Resources															
Impact 4.14-1: Construction-related impacts on scenic resources (vistas, roadways, and designated scenic areas) or the visual character of the project area and its surroundings.	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS		**LS**
Mitigation Measures															
4.14-1: Maintain Clean and Orderly Construction Sites.	X	X	X	X	X	X	X	X	X	X	X	X	X		

TABLE ES-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES – MPWSP PROPOSED PROJECT

IMPACT	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water PL	Brine Discharge PL	PL to CSIP Pond	New Desalinated Water PL	Castroville PL	New Transmission Main	ASR-5 and ASR-6 Wells	ASR Conveyance PL, ASR Pump-to-Waste PL, ASR Recirculation PL	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Carmel Valley Pump Station	Staging Areas	Overall Impact Significance Determination for Proposed Project
Section 4.14: Aesthetic Resources (cont.)															
Impact 4.14-2: Temporary sources of substantial light or glare during construction.	LSM	LS	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI	NI	NI	NI		**LSM**
Mitigation Measures															
4.14-2: Site-Specific Nighttime Lighting Measures.	X	-	X	X	X	X	X	X	X	-	-	-	-		
Impact 4.14-3: Permanent impacts on scenic resources (vistas, roadways, and designated scenic areas) or the visual character of the project area and its surroundings.	LSM	LS	NI	NI	NI	NI	NI	NI	LSM	NI	NI	NI	LS		**LSM**
Mitigation Measures															
4.14-3a: Facility Design.	X	-	-	-	-	-	-	-	X	-	-	-	-		
4.14-3b: Facility Screening.	-	-	-	-	-	-	-	-	X	-	-	-	-		
Impact 4.14-4: Permanent new sources of light or glare.	NI	LS	NI	NI	NI	NI	NI	NI	LSM	NI	NI	NI	LSM		**LSM**
Mitigation Measures															
4.14-2: Site-Specific Nighttime Lighting Measures.	-	X	-	-	-	-	-	-	X	-	-	-	X		
Impact 4.14-C: Cumulative impacts related to Aesthetic Resources	**LSM for cumulative impacts associated with nighttime lighting impacts during construction.**														
Section 4.15: Cultural and Paleontological Resources															
Impact 4.15-1: Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 of the CEQA Guidelines or historic properties pursuant to 36 CFR 800.5 during construction.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		**NI**
Mitigation Measures															
4.15-1: Avoidance and Vibration Monitoring for Pipeline Installation	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.15-2: Cause a substantial adverse change during construction in the significance of an archaeological resource pursuant to Section 15064.5 of the CEQA Guidelines or historic properties pursuant to 36 CFR 800.5.	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM		**LSM**
Mitigation Measures															
4.15-2a: Establish Archaeologically Sensitive Areas.	-	-	X	-	-	-	X	-	-	-	-	-	-		
4.15-2b: Inadvertent Discovery of Cultural Resources.	X	X	X	X	X	X	X	X	X	X	X	X	X		
Impact 4.15-3: Directly or indirectly destroy a unique paleontological resource or site, or unique geological feature during construction.	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.15-4: Disturbance any human remains, including those interred outside of formal cemeteries, during construction.	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM		**LSM**
Mitigation Measures															
4.15-4: Inadvertent Discovery of Human Remains.	X	X	X	X	X	X	X	X	X	X	X	X	X		
Impact 4.15-C: Cumulative impacts related to Cultural and Paleontological Resources.	**LS**														

TABLE ES-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES – MPWSP PROPOSED PROJECT

IMPACT	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water PL	Brine Discharge PL	PL to CSIP Pond	New Desalinated Water PL	Castroville PL	New Transmission Main	ASR-5 and ASR-6 Wells	ASR Conveyance PL, ASR Pump-to-Waste PL, ASR Recirculation PL	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Carmel Valley Pump Station	Staging Areas	Overall Impact Significance Determination for Proposed Project
Section 4.16: Agricultural Resources															
Impact 4.16-1: Result in changes in the existing environment that, due to their location or nature, could temporarily disrupt agricultural activities or result in the permanent conversion of farmland to non-agricultural use.	NI	LS	LSM	NI	NI	LSM	LSM	NI	NI	NI	NI	NI	NI		LSM
Mitigation Measures															
4.16-1: Minimize Disturbance to Farmland.	-	-	X	-	-	X	X	-	-	-	-	-	-		
Impact 4.16-2: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use.	NI	NI	LS	NI	NI	LS	LS	NI	NI	NI	NI	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.16-3: Conflict with zoning for agricultural uses or with Williamson Act contracts.	NI	NI	LS	NI	NI	LS	LS	NI	NI	NI	NI	NI	NI		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.16-C: Cumulative impacts related to Agricultural Resources.	**LSM for cumulative impacts related to conversion of farmland to non-agricultural use during construction.**														
Section 4.17: Mineral Resources															
Impact 4.17-1: Loss of availability of known mineral resources that are of value to the region or residents of the state or result in the loss of a locally-recognized important mineral resource recovery site.	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.17-C: Cumulative impacts related to Mineral Resources.	**LS**														
Section 4.18: Energy Conservation															
Impact 4.18-1: Use large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during construction.	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM		**LSM**
Mitigation Measures															
4.18-1: Construction Equipment and Vehicle Efficiency Plan.	X	X	X	X	X	X	X	X	X	X	X	X	X		
4.10-1b: Idling Restrictions.	X	X	X	X	X	X	X	X	X	X	X	X	X		
Impact 4.18-2: Use large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during operations.	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS		**LS**
Mitigation Measures															
None proposed.	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impact 4.18-3: Constrain local or regional energy supplies, require additional capacity, or affect peak and base periods of electrical demand during operations.	**LS**														
Mitigation Measures															
4.11-1: GHG Emissions Reduction Plan	**X**														
Impact 4.18-C: Cumulative impacts related to Energy Resources.	**LSM for impact associated with energy use during construction.**														

TABLE ES-2 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES – MPWSP PROPOSED PROJECT

IMPACT	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water PL	Brine Discharge PL	PL to CSIP Pond	New Desalinated Water PL	Castroville PL	New Transmission Main	ASR-5 and ASR-6 Wells	ASR Conveyance PL, ASR Pump-to-Waste PL, ASR Recirculation PL	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Carmel Valley Pump Station	Staging Areas	Overall Impact Significance Determination for Proposed Project
Section 4.19: Population and Housing															
Impact 4.19-1: Induce substantial population growth directly during project construction.	LS														
Mitigation Measures															
None proposed.	-														
Impact 4.19-2: Induce substantial population growth directly during project operations.	LS														
None proposed.	-														
Impact 4.19-C: Cumulative impacts related to Population and Housing.	LS														
Section 4.20: Socioeconomics and Environmental Justice															
Impact 4.20-1: Reductions in the rate of employment, total income, or business activity in Monterey County.	LSM														
Mitigation Measures															
4.9-1: Traffic Control and Safety Assurance Plan.	X														
Impact 4.20-2: Disproportionately high and adverse effects on low-income or minority populations.	LS														
Mitigation Measures															
None proposed.	-														
Impact 4.20-C: Cumulative impacts related to Socioeconomics and/or Environmental Justice.	**LSM for impact associated with interference with businesses during construction.**														

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CHAPTER 1
Introduction and Background

Sections

1.1 Introduction

The California American Water Company (CalAm) is proposing to construct and operate the Monterey Peninsula Water Supply Project (MPWSP, or proposed project) in the Monterey Bay area. CalAm is proposing the MPWSP to develop water supplies for CalAm's Monterey District service area (Monterey District) to replace existing supplies that have been constrained as a result of legal decisions affecting the Carmel River and Seaside Groundwater Basin (SWRCB Order 95-10 and the Seaside Basin Adjudication; see Sections 2.2.3 and 2.2.4). Based on the analysis presented in Chapter 2, some of the supply provided by the proposed project would meet existing demands and some of the supply would be available to serve future uses. Part of the project's implementation includes obtaining permits and authorizations from various federal, state, regional, and local agencies.

The California Public Utilities Commission (CPUC) is the lead State agency for the project. Given that a portion of the project is proposed to occur within Monterey Bay National Marine Sanctuary (MBNMS or Sanctuary), the National Oceanic and Atmospheric Administration's (NOAA's) MBNMS is the lead Federal agency considering through its authorization process, whether or not to allow otherwise prohibited MPWSP activities within MBNMS.

The California Environmental Quality Act (CEQA) requires that state, regional, and local agencies analyze and disclose potentially significant environmental effects for activities that involve governmental approval through the preparation of an Environmental Impact Report (EIR). The National Environmental Policy Act of 1969 (NEPA) requires that Federal agencies analyze and disclose the impacts of major Federal actions, including those projects regulated or approved by the agency, significantly affecting the quality of the human environment through an Environmental Impact Statement (EIS). This Final Environmental Impact Report and Environmental Impact Statement (EIR/EIS) has been prepared in accordance with CEQA (Cal. Pub. Res. Code §21000 et seq.) and the CEQA Guidelines (Cal. Code Regs., Tit. 20, Div. 6, Ch. 3,

§15000 et seq.), and with NEPA (42 U.S.C. §4321 et seq.,) and its implementing regulations (40 CFR Parts 1500-1508). For the purposes of this document, the CEQA lead agency for the MPWSP is the California Public Utilities Commission (CPUC); the NEPA lead agency is MBNMS.

This EIR/EIS has been prepared to analyze and disclose potentially significant environmental effects associated with the construction and operation of the MPWSP (see Chapter 4) proposed by CalAm (also referred to throughout this document as the "proposed project"[1]) and with the construction and operation of a range of alternatives to the proposed project (see Chapter 5). This EIR/EIS provides the primary source of environmental information for the lead, responsible, and trustee agencies to consider when exercising any permitting or approval authority related to implementation of CalAm's proposed project or alternatives. This Final EIR/EIS includes and responds to all comments concerning CEQA/NEPA issues that were received on the January 2017 Draft EIR/EIS (see Chapter 8), and includes revisions to the Draft EIR/EIS text made in response to comments as well as Lead Agency-initiated changes (see EIR/EIS Section 1.5.3 Revisions Made to the Draft EIR/EIS, for details).

The MPWSP would involve the construction and operation of various facilities and improvements, including a subsurface source water intake system, a desalination plant, desalinated water storage and conveyance facilities, and expanded Aquifer Storage and Recovery (ASR) facilities. See Chapter 3, Description of the Proposed Project, for a full description of the proposed facilities for the desalination plant.

CalAm's application includes two capacity options or build-out scenarios. The first option, addressed in this document as the Proposed Project, is a 9.6 mgd desalination plant and related facilities designed to meet the full project objectives. The second option would meet the project objectives by combining a reduced-capacity desalination plant (6.4 mgd) with a water purchase agreement for 3,500 acre-feet per year (afy) of advanced treated water from another source, the Pure Water Monterey Groundwater Replenishment (GWR) project. This second capacity option in CalAm's application is reflected in Alternative 5a. While both of these options were proposed by CalAm (in an "either/or" fashion) and thus represent the project proposed by the applicant, the larger desalination plant was selected to be analyzed as the Proposed Project in EIR/EIS Chapter 4, since it is the larger project, and thus was expected to have greater impacts than the smaller capacity option, which is fully examined as Alternative 5a in Chapter 5.

The EIR/EIS identifies alternatives consistent with NEPA and CEQA for the full capacity option and for the reduced capacity options. Alternatives to the full capacity option include Alternatives 1 and 2 and assume that GWR would not be operational, whereas the reduced capacity options reflected in Alternatives 5a and 5b assume that GWR would be operational. Alternatives 3 and 4 are desalination projects proposed by other entities and consist of different capacities; 22 mgd and 12 mgd, respectively. These alternatives are described and evaluated in Chapter 5.

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1 The term "proposed project" is used when referring to CalAm's proposed MPWSP. This term is used when discussing impacts resulting from implementation of all federal, state, and local permits, approvals, and authorizations. The term "proposed action," more commonly used in NEPA documents, refers specifically to MBNMS's ' three federal proposed actions described in Section 1.3.2.

The Monterey Regional Water Pollution Control Agency (MRWPCA) certified the Final EIR and approved the GWR Project in October 2015; see Appendix H for the GWR project description. The CPUC authorized CalAm to enter into a water purchase agreement for 3,500 afy from the GWR Project, and to build the new Monterey Pipeline and associated pump station needed for the GWR project, in September 2016. On March 30, 2017, the MRWPCA was issued a Water Quality Certification pursuant to section 401 of the Clean Water Act, and construction has commenced, for certain project components. However, additional permits will be needed for other project components, including issuance of a NPDES permit from the RWQCB and authorization from MBNMS. Therefore, presenting and evaluating both desalination capacity options allows the fullest consideration of the scope of the potential project and alternatives that may be feasible to meet project objectives under various scenarios, and furthers public transparency of the analysis of the options proposed in CalAm's applications to the CPUC and MBNMS.

This EIR/EIS also evaluates a No Action/No Project alternative, alternatives with different source water intake systems, and two additional complete desalination project alternatives being proposed by other entities. The analysis in Chapter 5 concludes that the proposed MPWSP is the environmentally superior alternative among the alternatives that produce at least 9.6 mgd of water; Alternative 5a combined with the GWR Project is the environmentally superior alternative if the GWR Project is able to produce water in a timely manner. The NEPA agency-preferred alternative is also Alternative 5a.

This chapter describes the roles of the Lead Agencies, and provides the proposed project and proposed action’s objectives, the purpose and need for agency actions, background information on the proposed project’s setting, and an overview of the environmental review process (including changes from the Draft to Final EIR/EIS) and the decisions to be made on the proposed project and proposed action.

1.2 Lead Agency Roles

1.2.1 California Public Utilities Commission

The CPUC is a constitutionally established[2] state agency charged with regulating investor-owned utilities (IOUs) in the transportation, energy, communications, and water industries. The Commission[3] consists of five commissioners who are appointed for six-year terms by the Governor. The commissioners are served by an Executive Director and a staff of professional engineers, economists, policy and industry analysts, attorneys, and administrative law judges (ALJs). The CPUC provides regulatory oversight for IOUs in the areas of purpose and need, economic cost, ratemaking, safety and reliability, and customer service, among others related to the four industries mentioned above. The CPUC makes decisions by vote of its commissioners at regularly scheduled public business meetings. More information on the CPUC is provided at: http://www.cpuc.ca.gov.

[2] State of California Constitution, Article XII.
[3] The CPUC refers to the state agency as a whole, while the “Commission” refers to the decision-making body consisting of the five commissioners.

The CPUC regulates the construction and expansion of water lines, plants, and systems by such private water service providers pursuant to Certificates of Public Convenience and Necessity (Pub. Util. Code §1001) and requires that water service providers charge their customers "just and reasonable rates." (Pub. Util. Code §§451 and 454). More specifically concerning Certificates of Public Convenience and Necessity, "No . . . water corporation . . . shall begin the construction of. . . a line, plant, or system, or of any extension thereof, without having first obtained from the commission a certificate that the present or future public convenience and necessity require or will require such construction." (Pub. Util. Code §1001.) The CPUC may issue a Certificate of Public Convenience and Necessity as requested, refuse to issue it, or issue it for only part of a project, and may attach terms and conditions to the exercise of the rights granted by the Certificate of Public Convenience and Necessity to the extent that, in the CPUC's judgment, the public convenience and necessity so require. (Pub. Util. Code §1005.)

CalAm is a public utility under the CPUC's jurisdiction, and has applied to the CPUC for a Certificate of Public Convenience and Necessity under Public Utilities Code Section 1001 to build, own, and operate all elements of the MPWSP, and also for permission to recover present and future costs for the proposed project by short-term rate increases.

1.2.2 Monterey Bay National Marine Sanctuary

MBNMS was designated in 1992 as a federally protected marine area off of California's central coast. It stretches from Marin to Cambria, encompasses a shoreline length of 276 miles and 4,601 square nautical miles of ocean, and extends an average distance of 30 miles from shore. Its mission is to "understand and protect the coastal ecosystem and cultural resources of Monterey Bay National Marine Sanctuary." Its goals include:

- enhancing resource protection through comprehensive and coordinated conservation and management tailored to the specific resources that complements existing regulatory authorities;
- supporting, promoting, and coordinating scientific research on sanctuary resources, and monitoring those resources to improve management decision-making in the sanctuary;
- enhancing public awareness, understanding, and ecologically sound use of the marine environment; and
- facilitating multiple uses of the sanctuary, so long as those uses are compatible with the Sanctuary's primary objective of resource protection, and so long as they are not otherwise prohibited.

As federal Lead Agency, MBNMS has joined in the preparation of this EIR/EIS for purposes of NEPA compliance and consideration of authorizations and permits for CalAm's proposed project. The authority for MBNMS actions is outlined in Section 1.3.2. The U.S. Army Corps of Engineers and the U.S. Army are Cooperating Agencies under NEPA due to their discretionary approval authority over some components of CalAm's proposed project and alternatives. A complete list of federal agencies and potential approval authorities is provided in Chapter 3, Table 3-8.

1.3 Project Objectives and Purpose and Need

The MPWSP is proposed to replace existing water supplies that have been constrained by legal decisions affecting the Carmel River and Seaside Groundwater Basin water resources. In 1995, the California State Water Resources Control Board (SWRCB) directed CalAm to reduce and eventually terminate surface water diversions from the Carmel River in excess of its legal entitlement of 3,376 acre-feet per year (afy). SWRCB Order 95-10 directed CalAm either to obtain appropriative rights to the water that was being unlawfully diverted, or to obtain water from other sources. In the meantime, to reduce diversions from the Carmel River to the greatest practicable extent, the order directed CalAm to implement conservation measures to offset demand and to maximize its use of the Seaside Groundwater Basin to serve existing customers. (See Chapter 2 for more information on Order 95-10 and the subsequent Cease and Desist Order, SWRCB Orders 2016-0016).

In 2006, the Monterey County Superior Court adjudicated the rights of various entities to use groundwater resources from the Seaside Groundwater Basin. In its decision, the Court established the adjudicated water rights of all the users of the Seaside Groundwater Basin, for the purpose of avoiding long-term damage to the basin. The adjudication substantially reduced the amount of groundwater available to CalAm (from approximately 4,000 afy to 1,474 afy). (See Section 2.2.4 in Chapter 2, Water Demand, Supplies, and Water Rights, for more information on the Seaside Groundwater Basin adjudication.)

The need for the proposed MPWSP is predicated on the following:

1. SWRCB Order 95-10, which requires CalAm to reduce and terminate surface water diversions from the Carmel River in excess of its legal entitlement of 3,376 afy;

2. SWRCB Order 2016-0016, which requires CalAm to terminate the diversions in excess of its legal entitlement by December 2021; and

3. The Monterey County Superior Court's adjudication of the Seaside Groundwater Basin, which effectively reduced CalAm's pumping from the Seaside Groundwater Basin from approximately 4,000 afy at the time of the adjudication to CalAm's adjudicated right of 1,474 afy.

1.3.1 Project Objectives

Based on information in CalAm's application to the CPUC[4], the primary objectives of the proposed MPWSP are to:

1. Develop water supplies for the CalAm Monterey District service area to replace existing Carmel River diversions in excess of CalAm's legal entitlement of 3,376 afy, in accordance with SWRCB Orders 95-10 and 2016-0016;

[4] The CPUC refined the general project objectives stated in CalAm's application to provide a sound basis for comparing alternatives.

2. Develop water supplies to enable CalAm to reduce pumping from the Seaside Groundwater Basin from approximately 4,000 to 1,474 afy, consistent with the adjudication of the groundwater basin, with natural yield, and with the improvement of groundwater quality;
3. Provide water supplies to allow CalAm to meet its obligation to pay back the Seaside Groundwater Basin by approximately 700 afy over 25 years as established by the Seaside Groundwater Basin Watermaster;
4. Develop a reliable water supply for the CalAm Monterey District service area, accounting for the peak month demand of existing customers;
5. Develop a reliable water supply that meets fire flow requirements for public safety;
6. Provide sufficient water supplies to serve existing vacant legal lots of record;
7. Accommodate tourism demand under recovered economic conditions;
8. Minimize energy requirements and greenhouse gas emissions per unit of water delivered; and
9. Minimize project costs and associated water rate increases.

The secondary objectives of the MPWSP are to:

1. Locate key project facilities in areas that are protected against predicted future sea-level rise in a manner that maximizes efficiency for construction and operation and minimizes environmental impacts; and
2. Provide sufficient conveyance capacity to accommodate supplemental water supplies that may be developed at some point in the future to meet build out demand in accordance with adopted General Plans; and
3. Improve the ability to convey water to the Monterey Peninsula cities by improving the existing interconnections at satellite water systems and by providing additional pressure to move water over the Segunda Grade.

1.3.1.1 MBNMS Purpose and Need for Proposed Actions

Three federal proposed actions are addressed in this document and consist of the following: 1) authorization of a Coastal Development Permit for CalAm to drill into the submerged lands of the Sanctuary to install a subsurface source water intake system; 2) authorization of a Central Coast Regional Water Quality Control Board (RWQCB) issued National Pollutant Discharge Elimination System (NPDES) permit to allow for the discharge of brine into the Pacific Ocean and MBNMS via an existing ocean outfall pipe, and; 3) issuance of a special use permit to CalAm for the continued presence of a pipeline[5] in MBNMS transporting seawater to or from a desalination facility.

[5] The Applicant proposes to use subsurface intakes (slant wells) to supply the desalination plant with source water. The well casings, or pipes, would extend seaward of mean high water and would require a special use permit to be present within MBNMS.

The purpose of these proposed actions is to authorize otherwise prohibited activities to occur within MBNMS, to ensure that the State and Federal permits and the proposed project comply with MBNMS regulations, and to ensure that MBNMS resources are protected by requiring terms and conditions that may be necessary. The MBNMS proposed action was prompted by CalAm's request for National Marine Sanctuaries Act (NMSA; 16 U.S.C. §1431 et seq.) authorizations and a permit to construct, operate, maintain, and decommission subsurface intake facilities in the Sanctuary, and to allow brine discharges through an existing ocean outfall facility within the Sanctuary; these activities would be associated with CalAm's proposed desalination plant. Therefore, the need for MBNMS action is to respond to CalAm's permit and authorization request in accordance with NMSA regulations and to protect Sanctuary resources. Since MBNMS has federal authority to issue authorizations and permits, impose additional conditions of approval, or to deny authorizations or permits for CalAm's proposed project, MBNMS qualifies as the lead federal agency under NEPA. As part of its review, MBNMS has coordinated with other government agencies that have jurisdiction over CalAm's proposed project, including NEPA cooperating agencies U.S. Army Corps of Engineers and the U.S. Army. A complete list of federal agencies and approval authorities is provided in Chapter 3, Table 3-8. MBNMS actions needed to approve CalAm's project include two authorizations and a special use permit as described below. While the ability to issue authorizations and special use permits is delegated to the MBNMS Superintendent, the ultimate NOAA decision-maker for approval of the EIS and Record of Decision for NEPA is the Assistant Administrator for the National Ocean Service.

1.3.1.2 Authorizations

The NMSA regulations identify activities that are prohibited in the sanctuaries and establish a system of permits or authorizations to allow the conduct of certain types of activities that are otherwise prohibited. Each sanctuary has unique regulatory prohibitions codified within a separate subpart of Title 15, Code of Federal Regulations, Part 922 (i.e., 15 CFR Part 922). Subpart M contains the regulations specific to MBNMS. Section 922.132 of the regulations lists activities that are prohibited or otherwise regulated within the Sanctuary. Among the listed prohibitions, the following prohibited activities relate to the proposed project and may qualify for authorizations, pursuant to Section 922.132(e):

1. Discharging or depositing from within or into the sanctuary any material or other matter, except as specified in A – F of this section. (15 CFR § 922.132(a)(2)(i)).
2. Drilling into, dredging, or otherwise altering the submerged lands of the sanctuary; or constructing, placing, or abandoning any structure, material, or other matter on or in the submerged lands of the sanctuary (15 CFR § 922.132(a)(4)).

One of the federal decisions to be made by MBNMS is whether or not to authorize two separate state permits (or approvals) that would allow CalAm's proposed drilling into the submerged lands (for installation of the proposed subsurface slant wells) and discharge of brine produced during the desalination process into the waters of the sanctuary.

The term "authorization" is a specific approval tool described in the NMSA regulations at 15 CFR Section 922.49, which provides, in part, that:

A person may conduct an activity prohibited by subparts L through P, or subpart R, if such activity is specifically authorized by any valid Federal, State, or local lease, permit, license, approval, or other authorization issued after the effective date of MBNMS designation, provided that: 1) the applicant notifies the Director of the Office of Ocean and Coastal Resource Management, NOAA, or designee, in writing, of the application for such authorization; 2) the applicant complies with the provisions of Section 922.49; 3) the Director notifies the applicant and authorizing agency that he or she does not object to issuance of the authorization, and; 4) the applicant complies with any terms and conditions the Director deems reasonably necessary to protect sanctuary resources and qualities.

Upon completion of the review of the application and information received with respect thereto, the Director shall notify both the agency and applicant, in writing, whether he or she has any objection to issuance and what terms and conditions he or she deems reasonably necessary to protect sanctuary resources and qualities.

1.3.1.3 Special Use Permit

NOAA has the authority in the NMSA (16 U.S.C. §1431 et seq.) to issue special use permits for specific activities in national marine sanctuaries to establish conditions of access to, and use of, any sanctuary resource or to promote public use and understanding of a sanctuary resource. Section 310(d) of the NMSA (16 U.S.C. § 1441(d)) allows NOAA to assess and collect fees for the conduct of any activity under a special use permit issued under that section. NOAA Office of National Marine Sanctuaries (ONMS) recently approved a new category of special use permit that allows the continued presence of a pipeline transporting seawater to or from a desalination facility (82 FR 42298). In addition to the two authorizations listed above, the other decision to be made by MBNMS is whether or not to issue that special use permit to CalAm for the continued presence of the subsurface slant wells in MBNMS. The authority to issue a special use permit is delegated to the MBNMS Superintendent.

1.4 Project Setting and Background

CalAm, the project applicant, is a privately owned public utility that has served the Monterey Peninsula since 1966. CalAm's Monterey District encompasses most of the Monterey Peninsula, including the cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside, and the unincorporated areas of Carmel Highlands, Carmel Valley, Pebble Beach, and the Del Monte Forest. The water supply challenges facing CalAm and the Monterey Peninsula are substantial and have been well-documented in a number of venues including the SWRCB, the Monterey County Superior Court, the CPUC, and the California Legislature. Water sources consist primarily of surface water from the Carmel River and groundwater from the Seaside Groundwater Basin. Because of its geography and rainfall patterns, the area is prone to severe droughts. Rainfall is the primary source of water and groundwater recharge within coastal Monterey County.

1.4.1 The Coastal Water Project

In 2004, CalAm filed Application A.04-09-019 seeking a Certificate of Public Convenience and Necessity from the CPUC for the Coastal Water Project (also referred to as the Moss Landing Project). The Coastal Water Project was intended to replace existing Carmel River water supplies for the CalAm Monterey District service area that are constrained by legal decisions described in Section 1.3, above. In general, the Coastal Water Project involved producing desalinated water supplies, increasing the yield from the Seaside Groundwater Basin ASR system, and building additional storage and conveyance systems to move the replacement supplies to the existing CalAm distribution system. The Coastal Water Project was sized to meet existing water demand and did not include supplemental supplies to accommodate growth. The Coastal Water Project proposed to use the existing intakes at the Moss Landing Power Plant to draw source water for a new 10 mgd desalination plant at Moss Landing, to build conveyance and storage facilities, and to make improvements to the existing Seaside Groundwater Basin ASR system. (Refer to Chapter 3, Description of the Proposed Project, for more information on the existing ASR system.)

On January 30, 2009, the CPUC published a Draft EIR analyzing the environmental impacts of the Coastal Water Project, as well as the environmental impacts of two project alternatives, the North Marina Project[6] and the Regional Project. The CPUC published the Coastal Water Project Final EIR (SCH No. 2006101004) in October 2009 and certified the EIR in December 2009 (Decision D.09-12-017). A year later, in Decision D.10-12-016, the CPUC approved implementation of the Regional Project alternative.

The Regional Project would have been implemented jointly by CalAm, Marina Coast Water District (MCWD), and Monterey County Water Resources Agency (MCWRA), and would have been built in two phases. It included vertical intake wells on coastal dunes located south of the Salinas River and north of Reservation Road; a 10-mgd desalination plant in North Marina (Armstrong Ranch); product water storage and conveyance facilities; and expansion of the existing Seaside Groundwater Basin ASR system. The second phase of the Regional Project, which was evaluated at a programmatic level of detail, included water to meet demand under buildout of the service-area cities' general plans and water for areas of North Monterey County.

The Coastal Water Project Draft EIR and Final EIR are available for review during normal business hours at the CPUC, 505 Van Ness Avenue, San Francisco, California.

6 The North Marina Project alternative included most of the same facilities as the previously proposed Coastal Water Project and, like the previously proposed Coastal Water Project, would only provide replacement supplies to meet existing demand. The key differences between the North Marina Project alternative and the previously proposed Coastal Water Project were that the slant wells and desalination plant would be constructed at different locations (Marina State Beach and North Marina, respectively), and the desalination plant would have a slightly greater production capacity (11 mgd versus 10 mgd).

1.4.2 The Monterey Peninsula Water Supply Project

After the CPUC approved the Regional Project, CalAm withdrew its support for that project in January 2012. On July 12, 2012, in Decision D.12-07-008, the CPUC closed the Coastal Water Project proceeding.

In April 2012, CalAm submitted Application A.12-04-019 (CalAm, 2012), asking the CPUC's permission to build, own, and operate a desalination facility for water supply. This project is the MPWSP. The MPWSP incorporates many of the same elements previously analyzed in the Coastal Water Project EIR, including a modified version of the North Marina Alternative that would include a desalination facility and subsurface slant wells at new locations. The MPWSP would include many of the same Aquifer Storage and Recovery (ASR) systems and most of the conveyance and storage facilities that were evaluated for the North Marina Alternative in the Coastal Water Project Final EIR. There are, however, changes to some of the project facilities.

The MPWSP includes the following proposed facilities, all of which are described in detail, and locations shown on figures, in Chapter 3:

1. A source water intake system, which would consist of 10 subsurface slant wells (eight active and two on standby) extending offshore into the submerged lands of Monterey Bay at the CEMEX sand mining facility in the City of Marina, and a Source Water Pipeline;

2. A 9.6 mgd desalination plant located on a CalAm-owned parcel on Charles Benson Road, which would produce an average of 9.5 mgd of desalinated water supplies. Other facilities would be located with the plant, including pretreatment, reverse osmosis (RO), and post-treatment systems; backwash supply and filtered water equalization tanks; treated water storage tanks; chemical feed and storage facilities; brine storage and conveyance facilities; and other associated non-process facilities;

3. Desalinated water conveyance facilities, including pipelines, pump stations, and clearwells; and

4. An expanded ASR system, including two additional injection/extraction wells (Wells ASR-5 and ASR-6) and three ASR pipelines (ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline).

1.4.3 Environmental Review: Context for this Final EIR/EIS

The previous MPWSP Draft EIR was issued on April 30, 2015, for a 60-day review period. The MPWSP Draft EIR is available for review during normal business hours at the CPUC, 505 Van Ness Avenue, San Francisco, California.

In a letter dated July 9, 2015, the CPUC Energy Division[7] extended the public comment period on the Draft EIR until September 30, 2015 for three reasons:

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[7] Energy Division is responsible for all large scale CEQA Compliance efforts at the CPUC, including water infrastructure projects like this one.

1. To address a possible conflict of interest associated with one of the CPUC's environmental subconsultants, Geosciences;
2. To provide access to the data, models, and assumptions used by Geosciences in the hydrogeologic modeling work; and
3. To seek comments from the public on the advisability of recirculating the Draft EIR as a joint state/federal environmental review document (EIR/EIS) that complies with both CEQA and NEPA requirements, in coordination with the Sanctuary.

Approximately 150 comment letters from various federal, state, and local agencies, special interest groups, and individuals were received during the 5-month Draft EIR public review period. In September 2015, after considering the Draft EIR comments and based on conversations with the Sanctuary and internal CPUC deliberations, the CPUC Energy Division announced that the Draft EIR would be modified and recirculated as a joint EIR/EIS in coordination with MBNMS; the groundwater modeling would be peer-reviewed and updated by a new groundwater modeling consultant; and the recirculated document would further consider as alternatives the two other active desalination proposals at Moss Landing: the Monterey Bay Regional Water Project (aka DeepWater Desal) and the People's Moss Landing Water Desalination Project (the People's Project).

On August 26, 2015, NOAA's Office of National Marine Sanctuaries started the NEPA process by issuing a Notice of Intent (NOI) to prepare an EIS for the project (80 Fed. Reg. 51787). The NOI solicited input on the issues to be analyzed in depth related to the portion of the proposed project within the Sanctuary's boundaries, and regarding the full spectrum of environmental issues and concerns relating to the scope and content of the EIS. On September 10, 2015, MBNMS held a NEPA scoping meeting for the project; the scoping period closed on October 2, 2015. A summary of EIS scoping comments is provided in **Appendix A**.

To address questions about the accuracy and credibility of the groundwater modeling work that was the subject of the potential conflict of interest comments, the CPUC made the groundwater data files available for public review, and the CPUC employed the Lawrence Berkeley National Laboratory to conduct an independent evaluation of that data. The results of that evaluation are incorporated into the groundwater model that was used in the analysis in Chapters 4 and 5, and are provided in detail in **Appendix E1**.

Per CEQA Guidelines Section 15088.5(f)(1), regarding the treatment of comments when recirculating a substantially revised, complete EIR, the CPUC need not provide individual responses to comments received on the April 2015 Draft EIR, and such responses are therefore not provided in this EIR/EIS. Instead, the comments received by September 2015 on the April 2015 Draft EIR will become part of the administrative record of this proceeding, and key substantive comments and themes of comments received on the April 2015 Draft EIR have been addressed in the appropriate sections of this EIR/EIS. See Section 1.5, Environmental Review Process, for details about the CPUC's and the Sanctuary's joint CEQA/NEPA process for the proposed project. Under Section 15088.5(f)(1), new comments were required to be submitted on the Draft EIR/EIS and it is only these new comments that are responded to in this Final EIR/EIS.

1.4.4 Revisions Made in the 2017 Draft EIR/EIS Compared to the 2015 Draft EIR

On March 14, 2016, CalAm filed an Amended Application with the CPUC (CalAm, 2016) in response to feedback from the community and resource agencies, the findings made in the April 2015 Draft EIR alternatives analysis regarding pipeline alignments, and increased technical knowledge and experience resulting from the installation and operation of the test slant well.[8] The updated project description provided in Appendix H of CalAm's Amended Application reflects modifications to facilities analyzed in the 2015 Draft EIR. These modifications are included in this EIR/EIS project description (Chapter 3). The most substantial modifications include:

1. Revised slant well layout at CEMEX:
   a. Revised slant well configuration: two sites with three slant wells each and four sites with a single well. (The previous configuration had the 10 slant wells grouped at three sites.)
   b. Six single-story electrical control cabinets. (The previous configuration included one electrical control building for all wells.)
   c. Well Sites 1 through 6 would include the following facilities: aboveground wellhead(s), a below-ground mechanical piping vault (12 feet by 6 feet by 6 feet) for meters, valves, gauges, etc. per well, an aboveground electrical enclosure, and a pump-to-waste basin. The electrical controls for operation of the slant wells would be housed in a single-story, 17-foot-long by 10-foot-wide, 10-foot-tall fiberglass enclosure located at each of the six well sites. All permanent slant wells and associated aboveground infrastructure would be built on a 5,250- to 6,025-square-foot graded pad located above the maximum high tide elevation on the inland side of the dunes (no concrete pads would be constructed). Wellheads would be located aboveground. (With the exception of the electrical control building, the previous configuration located all of the wellhead facilities below grade.)
2. Revised alignments for the roughly 21 miles of conveyance pipelines.
   a. The "New" Transmission Main (product water pipeline south of Reservation Road that was evaluated in the April 2015 Draft EIR as an Alternative Pipeline) becomes the proposed pipeline.

[8] In October 2014, MBNMS finished its NEPA review of the construction of the test slant well and the operation of the pilot program, and issued a Finding of No Significant Impact (FONSI). In September 2014, the City of Marina declined to adopt its Initial Study and Mitigated Negative Declaration and denied CalAm's CDP application for development of the test slant well, and in November 2014, the CCC approved the CDP application on appeal and documented its compliance with CEQA requirements. The test slant well is permitted to operate until February 2019 (per a December 2017 permit amendment) and it is not part of the proposed project being evaluated in this EIR/EIS. If the MPWSP with subsurface slant wells at CEMEX is not approved and implemented, the test well will be removed as analyzed and approved pursuant to the CEQA and NEPA reviews of the test slant well project. However, if the proposed subsurface slant wells at CEMEX are ultimately approved as part of the proposed project, CalAm would convert the test slant well into a permanent well (forming one of the 10 wells) and operate it as part of the proposed seawater intake system. The conversion and long-term operation of the well has not been covered under previous approvals and is evaluated in this EIR/EIS as part of the proposed project.

b. The Transfer Pipeline evaluated in the April 2015 Draft EIR has been eliminated, since it is no longer necessary due to the alignment of the New Transmission Main and the New Monterey Pipeline.

3. The "New" Monterey Pipeline (product water pipeline connecting Seaside and Pacific Grove) is discussed in the Chapter 4 cumulative analysis for each topical area to which its impacts are relevant, since the CPUC in Decision 16-09-021 on September 15, 2016, authorized CalAm to build the Monterey Pipeline and Monterey Pump Station, subject to compliance with a Mitigation Monitoring and Reporting Program.

4. The ASR Pump Station has been eliminated. The Monterey (Hilby) Pump Station, like the new Monterey Pipeline discussed above and for the same reason, is discussed in the Chapter 4 cumulative analysis for each topical area where relevant.

5. The preferred method of returning water to the Salinas Valley now includes a new 5-mile-long pipeline to the city of Castroville, with connections to the Castroville Community Services District (CCSD) and Castroville Seawater Intrusion Project (CSIP) distribution systems. Returning the water via the existing Salinas Valley Reclamation Project Storage Pond (hereafter referred to as "CSIP pond") is retained as a backup option. (Previously, Salinas Valley return flows would be returned to the existing CSIP pond at the MRWPCA Regional Wastewater Treatment Plant.)

6. Revised construction assumptions, phasing, and schedule.

In addition to the project description changes, the Draft EIR/EIS included several other substantive revisions to the 2015 Draft EIR. These include some re-organization of the document, revised technical studies, and revisions to the analyses as a result of the revised technical studies, including:

1. MBNMS, as federal lead agency, has proposed federal actions pertaining to CalAm's application, including authorization of state permits and issuance of a special use permit for otherwise prohibited activities within MBNMS. These proposed actions are discussed in Section 1.3.2, above.

2. All topical sections (in Chapter 4) have been revised in response to the amended project description (in Chapter 3).

3. Cumulative impacts are now addressed within each topical section in Chapters 4 and 5, rather than being addressed in a separate chapter.

4. The Variant (Reduced Project) is now referred to as Alternative 5 and is evaluated in Chapter 5, Alternatives Screening and Analysis, rather than in a stand-alone chapter. The DeepWater Desalination Project and the People's Project are also addressed in Chapter 5, Alternatives Screening and Analysis

5. Additional brine discharge modeling has been performed. It is included as Appendix D1 and reflected in the analyses in Section 4.3, Surface Water Hydrology and Water Quality, and Section 4.5, Marine Biological Resources.

6. Revised Ocean Plan Water Quality Compliance analysis has been performed. It is included as Appendix D3 and reflected in the analyses in Sections 4.3, Surface Water Hydrology and Water Quality, and Section 4.5, Marine Biological Resources.

7. Lawrence Berkeley National Laboratory has peer-reviewed the groundwater modeling performed for the April 2015 Draft EIR (referred to as North Marina Groundwater Model version 2015, or $NMGWM^{2015}$) and the review is included as Appendix E1.

8. The North Marina groundwater model has been revised (referred to as North Marina Groundwater Model version 2016, or $NMGWM^{2016}$) and new groundwater modeling has been performed. Modeling results are included as Appendix E2 and reflected in the analyses in Section 4.4, Groundwater Resources and Chapter 5, Alternatives Screening and Analysis.

9. The coastal hazards analysis has been revised as a result of the re-located wells at the CEMEX sand mine property. That analysis is included as Appendix C2 and reflected in Section 4.2, Geology, Soils, and Seismicity.

10. Sensitive plant lists and calculations regarding energy consumption and air pollutant and greenhouse gas (GHG) emissions have been revised; see Sections 4.6, Terrestrial Biological Resources, Section 4.10, Air Quality, Section 4.11, Greenhouse Gas Emissions and Section 4.18, Energy Conservation.

1.5 Environmental Review Process and Use of This Document

This EIR/EIS has been prepared in compliance with CEQA (Pub. Res. Code §21000 et seq.) and NEPA (42 U.S.C. §4321 et seq., and implementing regulations at 40 CFR 1500-1508). This EIR/EIS is a public document for use by the CPUC, MBNMS, other governmental agencies, and the public in identifying and evaluating the potential environmental consequences of the proposed project and proposed federal actions, identifying mitigation measures to lessen or eliminate adverse impacts, and examining feasible alternatives to the proposed project. The impact analyses in this report are based on a variety of sources; references for these sources are listed at the end of each technical section.

This Final EIR/EIS will be used primarily by the CPUC, as the CEQA Lead Agency, and by MBNMS, as the NEPA Lead Agency, to evaluate environmental impacts of the proposed project and its alternatives as part of the decision-making processes of these agencies. It is expected that the CPUC, MBNMS, the U.S. Army, and other responsible trustees, and relevant agencies will use this EIR/EIS in deciding whether to approve the MPWSP or any alternative to, or of, the MPWSP. The analyses contained within this EIR/EIS would be used to determine any necessary regulatory permits, authorizations, or approvals.

1.5.1 Notice of Preparation, Notice of Intent, and Scoping

In accordance with CEQA Guidelines Section 15082, the CPUC issued a Notice of Preparation (NOP) for the MPWSP and circulated it to local, state, and federal agencies, Native American tribal organizations, as well as other interested parties, on October 5, 2012. The NOP solicited both written and verbal comments on the document’s scope during a 30-day comment period and provided information on the forthcoming public scoping meetings. Comments were requested by November 5, 2012. The NOP provided a description of the MPWSP, a discussion of possible alternative projects being considered, a map of the project location and the area, and a summary of the probable environmental effects of the project to be addressed.

In addition to the NOP, the CPUC published legal and display advertisements in the *Monterey Herald* on October 10, October 21 and October 24, 2012; in the *Carmel Pine Cone* on October 12, 2012; in the *Salinas Californian* on October 10 and October 25, 2012; and in Spanish in the *El Sol* on October 12, 2012.

During the CEQA scoping period, the CPUC held a series of three scoping meetings in Monterey County to discuss the proposed project and to solicit public input as to the scope and content of this EIR. Scoping meetings were held on October 24, 2012 in Carmel, and on October 25, 2012 in Seaside.

In accordance with Section 102(2)(C) of NEPA (42 U.S.C. § 4332), the NOAA Office of National Marine Sanctuaries published a Notice of Intent (NOI) to prepare an EIS for the proposed project on August 26, 2015 (80 Fed. Reg. 51787). The NOI solicited input on the full spectrum of environmental issues and concerns relating to the scope and content of the EIS, including: the human and marine biological resources that could be affected, the nature and extent of the potential significant impacts on those resources, a reasonable range of alternatives, and mitigation measures. The NOI provided background information, information on possible alternatives, explained the need for action, and disclosed federal consultation obligations. The scoping period closed on October 2, 2015.

During the NEPA scoping period, MBNMS held a scoping meeting in Pacific Grove on September 10, 2015 to discuss the proposed project and to solicit public input as to the scope and content of the EIS.

Appendix A of this EIR/EIS contains a copy of the NOP and NOI, a description of public outreach efforts, a summary of comments received during the scoping process and a Draft EIR/EIS Distribution List.

1.5.2 Draft EIR/EIS and Public Review

A joint document constituting the Draft EIR/EIS was published on January 13, 2017. As provided for in CEQA and NEPA, the Draft EIR/EIS was consistent with the February 2014 guidance issued by the Executive Office of the President of the United States and the California Governor's Office of Planning and Research entitled, NEPA and CEQA: Integrating Federal and State Environmental Reviews. The Draft EIR/EIS was circulated to local, state, and federal agencies as well as interested organizations and individuals who wished to review it. Notice of the Draft EIR/EIS was also sent directly to every agency, person, or organization that commented on the CPUC's NOP or the Sanctuary's NOI. The January 13, 2017 publication of the Draft EIR/EIS marked the beginning of a public review and comment period that was subsequently extended to close on March 29, 2017. The Lead Agencies held two public meetings on February 15, 2017, and a public hearing for the receipt of oral and written comments on the Draft EIR/EIS on February 16, 2017.

The Lead Agencies received approximately 82 comment letters, plus 2 form letter submissions, sent through mail, hand-delivery, or email, as well as 18 oral comments from the public hearing. On November 9, 2017, subsequent to the close of the Draft EIR/EIS comment period, MCWD submitted additional comments to the Lead Agencies including a June 16, 2017 "Preliminary Interpretation of SkyTEM Data Acquired in the MCWD", a September 29, 2017 memo from Hopkins Groundwater Consultants, and a June 22, 2017 memo from EKI, "Groundwater Remedial Actions and Establishment of Remedial Goals at the Fort Ord Marina Coast Water District, California. Comments Regarding Cal Am Monterey Peninsula Water Supply". EIR/EIS Chapter 8, Responses to Comments, includes a list of all agencies, organizations, and individuals that submitted comments, copies of all letters and the transcript of oral comments, and responses to all comments.

1.5.3 Final EIR/EIS and Revisions Made to the Draft EIR/EIS

Following circulation of the Draft EIR/EIS and incorporation of public comments and responses to comments (see Chapter 8), the Final EIR/EIS is being published by the CPUC and submitted into the formal record of the Commission's Certificate of Public Convenience and Necessity proceeding (A.12-04-019). Concurrently, NOAA is submitting the Final EIR/EIS to the U.S. EPA and publishing a Notice of Availability in the Federal Register. This begins the 30-day waiting period required under NEPA prior to signing a Record of Decision.

Public and agency comments on the Draft EIR/EIS did not require changes in the conclusions of the Draft EIR/EIS that resulted in any new or substantially more severe impacts for the proposed project. Furthermore, there were no substantial changes to the proposed project or to the circumstances under which the proposed project would be undertaken, or significant new information relevant to environmental concerns that indicate the proposed project would result in impacts more adverse than disclosed in the Draft EIR/EIS or that additional feasible mitigation measures or alternatives warrant consideration. The following key changes have been incorporated into the Final EIR/EIS, consistent with minor modifications made to the proposed project and other clarifications requested by comments on the Draft EIR/EIS:

- Removal of references to, and analysis of, the Terminal Reservoir, which CalAm has indicated is not needed for project operation and no longer proposes as part of the project;
- Revisions to Slant Well Sites 2 through 6 by making them graded pads rather than concrete pads, thereby eliminating almost 25,000 square feet of new impervious surfaces;
- Addition of the Brine Mixing Box to the description and analysis of the proposed Brine Disposal Pipeline by request of CalAm and Monterey Regional Water Pollution Control Agency (MRWPCA);
- Inclusion of additional brine discharge dilution modeling and Ocean Plan Compliance modeling in Section 4.3, Surface Water Hydrology and Water Quality, by request of MRWPCA (also see revised Appendices D1 and D3);
- Inclusion of information from recent geophysical studies of seawater intrusion in the Salinas Valley Groundwater Basin (SVGB) – Electrical Resistivity Tomography (ERT) and Airborne Electromagnetics (AEM) – in Section 4.4.1.4, Groundwater Resources;

- Expansion of the SVGB Deeper Aquifers discussion in Section 4.4.1.2 and the Return Water/Ocean Water Percentage discussion in Section 4.4.1.5, Groundwater Resources;
- Clarification of the capture zone, the cone of depression, aquifer responses to the Deep Aquifers and consistency of the proposed project with the Sustainable Groundwater Management Act (SGMA) in Section 4.4.5.2;
- Revision of Applicant Proposed Measure 4.4-3, Groundwater Monitoring and Avoidance of Well Damage;
- Revision of several mitigation measures to clarify performance standards and provide additional details for implementation;
- Revision of Mitigation Measure 4.11-1 in Section 4.11, Greenhouse Gas Emissions, to require net zero indirect emissions from electricity use during operation (reducing the significance of all impacts related to greenhouse gas emissions from significant and unavoidable to less than significant with mitigation);
- Revision of Impact and Mitigation Measure 4.13-5 in Section 4.13, Public Services and Utilities, to address potential corrosion of the existing outfall as a result of MPWSP brine discharge, including WEKO seal clamp replacement inside the existing offshore segment of the outfall;
- Revision to Section 6.4, Project Consistency with MBNMS Desalination Guidelines, to include alternatives described in Section 5.4 in the assessment of project conformity with guidelines for desalination plants in MBNMS (see Table 6.4-1); and
- Addition of the Hydrogeologic Working Group's Hydrogeologic Investigation Technical Report as Appendix E3.

Other minor corrections, clarifications, and explanations have been made throughout the document. A version of the Final EIR/EIS showing the revisions using strikethrough/underline is available for download at: https://tinyurl.com/mpwsp-feireis.

1.5.4 Use of this EIR/EIS in Decision Making

1.5.4.1 CPUC Consideration of the EIR/EIS and Proposed Project

The assigned CPUC Administrative Law Judges (ALJs) will review the Final EIR/EIS and submit a proposed decision to the Commission concerning certification of the EIR/EIS and approval of the MPWSP. Pursuant to CEQA Guidelines Section 15090, as CEQA Lead Agency, the CPUC must certify that the Final EIR/EIS complies with CEQA and reflects the CPUC's independent judgment and analysis prior to approving the MPWSP or an alternative.

If the CPUC certifies the Final EIR/EIS, it will then decide whether or not to grant the Certificate of Public Convenience and Necessity for the MPWSP, as proposed or modified. In addition to environmental impacts addressed during the CEQA process, the Certificate of Public Convenience and Necessity process will consider any other issues that have been established in the record of the proceeding, including but not limited to economic issues, social impacts, specific routing and alignments, and the need for the project. During this process the CPUC will also take into account testimony and briefs from parties who have formally intervened in

A.12-04-019, as well as the formal record of any hearings held by the ALJ in this case. The five CPUC Commissioners will ultimately cast a vote on whether to approve the proposed decision prepared by the ALJs. One or more Commissioners may also prepare alternate proposed decisions that differ from the proposed decision of the ALJs. Whichever proposed decision – original or alternate – garners at least a majority vote of the CPUC Commissioners will become the decision of the Commission.

Should the CPUC decide in favor of the MPWSP, as proposed or as modified, the CPUC must make findings on each significant environmental impact. As to each such impact, the Lead Agency must find that either: (1) the environmental effect has been reduced through mitigation measures to a less-than-significant level, essentially “eliminating, avoiding, or substantially lessening” the expected impacts, or; (2) the residual significant adverse impact that cannot be mitigated to less than-significant level is outweighed by project benefits. This latter finding is called a Statement of Overriding Considerations. If the CPUC makes a Statement of Overriding Considerations, it would be included in the record of the project approval and would be mentioned in the notice of determination.

The CPUC may also deny the proposed project, but decide in favor of an alternative that may require further action on the part of other parties and public agencies. The Commission’s final decision may therefore include an order for CalAm to return to the Commission at a later time for approval of either a specific project or some form of water purchase agreement, either of which would resolve at a minimum the water supply issues raised by SWRCB Order 95-10 and the Seaside Basin adjudication.

In addition, state law requires lead agencies to adopt a mitigation monitoring and reporting program for those changes to a project that it has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment. CEQA does not require that the specific reporting or monitoring program be included in the EIR. Throughout this EIR/EIS, however, proposed mitigation measures have been clearly identified and presented in language that will facilitate establishment of a monitoring program. All adopted measures will be included in a mitigation monitoring and reporting program to verify compliance.

1.5.4.2 MBNMS Consideration of the EIR/EIS and Proposed Action

This Final EIR/EIS will be used by MBNMS, along with other information developed in the formal record (including interagency consultations in compliance with the Endangered Species Act, Marine Mammal Protection Act, Magnuson Stevens Act, and the National Historic Preservation Act, among others), to decide whether or not to: authorize a Coastal Development Permit to be issued by the City of Marina under its certified Local Coastal Program (or by the California Coastal Commission on appeal, if the City of Marina denies the permit); authorize a NPDES permit to be issued by the Central Coast RWQCB, and/or; issue a special use permit to CalAm for the continued presence of a pipeline conveying seawater to or from a desalination facility. After MBNMS completes the final NEPA analysis, a 30-day mandatory waiting period will occur after issuance of the Final EIR/EIS, and then MBNMS may issue its Record of Decision (ROD). The decision-making authority for the Record of Decision under NEPA is NOAA’s Assistant Administrator for the National Ocean Service (NOAA Administrative Order 216-6A; NOAA, 2016).

1.5.4.3 Other Agencies' Consideration of the EIR/EIS and Proposed Project

Several other agencies will rely on information in this EIR/EIS to inform their decisions over the issuance of specific permits related to project construction or operation. In addition to the CPUC, state agencies such as the SWRCB, the Regional Water Quality Control Boards (Regional Water Boards), California State Lands Commission, California Coastal Commission, Department of Parks and Recreation, Department of Transportation, California Department of Fish and Wildlife, and State Historic Preservation Office would be involved in reviewing or approving the proposed project. On the local level, the City of Marina would be reviewing and approving an application for a Coastal Development Permit for the slant wells consistent with their certified Local Coastal Plan and MRWPCA would be reviewing and approving CalAm's use of the existing wastewater outfall. On the federal level, agencies with reviewing or permitting authority include NMFS, the U.S. Army, the U.S. Army Corps of Engineers, and the U.S. Fish and Wildlife Service (USFWS). A complete list of agencies and required permits or other approvals is included in Chapter 3, Description of the Proposed Project, Table 3-8.

1.6 Organization of Final EIR/EIS

The remaining chapters of this EIR/EIS are organized as follows:

Chapter 2 (Water Demand, Supplies, and Water Rights) provides background information on CalAm's existing water supply system; describes the water demand and supply information and assumptions included in CalAm's application; provides supplemental information about water supply and demand, and factors affecting them in the area that would be served by the proposed project; and addresses the topic of water rights as it pertains to project feasibility.

Chapter 3 (Description of the Proposed Project) describes the components of the MPWSP proposed by CalAm, including construction, operations and maintenance. The information in this chapter is intended to provide a common basis for the analysis of environmental impacts.

Chapter 4 (Environmental Setting [Affected Environment], Impacts, and Mitigation Measures) is divided by issue area or topic, and addresses the proposed project. Each issue area section describes the regional and local environmental setting (the "affected environment"); describes the Sanctuary and sanctuary resources; summarizes applicable laws, regulations, plans, and standards (the "regulatory framework"); identifies the thresholds and other criteria evaluated to determine whether a potential impact would be significant; summarizes the analytical methodology used; analyzes direct, indirect, and cumulative effects of the proposed project on the resource; identifies mitigation measures to address adverse effects; and explains the residual impacts that would remain after the implementation of all recommended mitigation measures. References cited in the analyses are listed in each section.

Chapter 5 (Alternatives Screening and Analysis) describes the alternatives screening process, identifies several alternatives to the proposed project that are being carried forward for full analysis, including the No Action alternative, and summarizes alternatives identified but removed from consideration. This chapter also includes the impact analysis for each alternative and a detailed comparison of the alternatives to the proposed project. References cited in the analyses are listed in each topical section. An environmentally superior alternative and a NEPA-agency preferred alternative are identified and they are one and the same (see Section 5.6).

Chapter 6 (Other Considerations) addresses other CEQA and NEPA issues, including significant unavoidable impacts, significant irreversible changes, short-term versus long-term uses, growth-inducing impacts, and project consistency with MBNMS Desalination Guidelines.

Chapter 7 (Coordination, Consultation, and Report Preparation) outlines the federal agency consultation process conducted for the project and identifies the authors of the EIR/EIS.

Chapter 8 (Comments and Responses on the 2017 Draft EIR/EIS) provides Master Responses that address common issues raised during the public review period, as well as copies of all comments received on the Draft EIR/EIS and responses to these comments.

Chapter 9 (Index) includes an alphabetical list of key words and their associated page numbers within the EIR/EIS.

The Appendices include a scoping summary, a Draft EIR/EIS distribution list, technical reports and other supporting information.

References – Introduction and Background

82 FR 42298, Final Notice of a New Category of Special Use Permit Related to the Operation of Desalination Facilities Producing Potable Water for Consumption (Sept 7, 2017).

California American Water (CalAm), 2012. Before the Public Utilities Commission of the State of California, A.12-04-019, Application of California-American Water Company (U210W) for Approval of the Monterey Peninsula Water Supply Project and Authorization to Recover All Present and Future Costs in Rates, Filed April 23, 2012.

California American Water (CalAm), 2016. Before the Public Utilities Commission of the State of California, A.12-04-019, Amended Application of California-American Water Company (U210W), Filed March 14, 2016.

Monterey County Superior Court, 2006. California American Water, Plaintiff, vs. City of Seaside, City of Monterey, et al., Case No. M66343, Decision. Filed March 27, 2006.

National Oceanic and Atmospheric Administration (NOAA), 2016. NOAA Administrative Order 216-6A, April 22, 2016. Compliance with the National Environmental Policy Act, Executive Orders 12114, Environmental Effects Abroad of Major Federal Actions; 11988 and 13690, Floodplain Management; and 11990, Protection of Wetlands. [http://www.corporateservices.noaa.gov/ames/administrative_orders/chapter_216/NAO_216-6A.pdf]

State Water Resources Control Board (SWRCB), 1995. Order No. WR 95-10: Order on Four Complaints Files Against The California-American Water Company, Carmel River, Monterey County. July 6, 1995.

CHAPTER 2
Water Demand, Supplies, and Water Rights

Sections	Tables
2.1 Introduction 2.2 Background 2.3 CalAm Service Area Demand 2.4 Available Supplies 2.5 Other Supply and Demand Considerations 2.6 Water Rights	2-1 Seaside Groundwater Basin Adjudicated Operating and Natural Safe Yields with CalAm's Pre-adjudication Production 2-2 Existing Demand 2006–2015 2-3 Other Demand Assumptions 2-4 CalAm Monterey District Water Supplies with Proposed MPWSP 2-5 Future Water Demand – Service Area Jurisdictions

As a result of comments received on the January 2017 Draft EIR/EIS, revisions have been made to this EIR/EIS section. Those changes include:

- *The existing Pebble Beach water entitlement of 325 acre-feet per year has been included in the Existing System Demand.*

2.1 Introduction

In its application to the California Public Utilities Commission (CPUC) for the Monterey Peninsula Water Supply Project (MPWSP, or proposed project), California American Water (CalAm) proposes either to build a desalination plant with the capacity to produce up to 9.6 million gallons per day (mgd) of desalinated product water, or to build a smaller project that would include the purchase of product water from the proposed Pure Water Monterey Groundwater Replenishment (GWR) project and construction of a 6.4 mgd desalination plant (CalAm, 2016a). This chapter provides background information on CalAm's existing water supply system; describes the water demand[1] and supply information and assumptions included in CalAm's application; provides supplemental information about water supply and demand, and factors affecting them in the area that would be served by the proposed project; and addresses the topic of water rights as it pertains to project feasibility.

CalAm initially filed its application for the MPWSP (Application A.12-04-019) with the CPUC in April 2012 (CalAm, 2012a). The application requests a Certificate of Public Convenience and

[1] Unless otherwise noted, "demand" as used in this chapter refers to *system demand* (sometimes known as production), which is the total amount of potable water produced from supply sources. Demand does not refer to the amount of water delivered and billed to customers, which is typically referred to as consumption or the amount of water consumed. System demand includes "unaccounted-for" or "non-revenue" water, such as water used for flushing water system pipes and fire fighting, and water lost to leaks within the delivery system.

Necessity[2] and approval to build, own, and operate the MPWSP. In January 2013, CalAm submitted supplemental testimony that updated and superseded the water demand and supply estimates that had been provided in the original April 2012 application; the January 2013 testimony proposed a 9.6 mgd desalination plant that would produce approximately 10,627 acre feet per year (afy) of desalinated product water to meet estimated service area demand of 15,296 afy and provide return water for the Salinas Valley Groundwater Basin (SVGB return water),[3] or a project variant consisting of a 6.4 mgd plant in conjunction with the purchase of GWR water (Svindland, 2013a). In March 2016, CalAm submitted an amended application and updated project description. The 2016 amended application and associated testimony confirmed the project sizing and overall demand assumptions described in the January 2013 supplemental testimony while updating estimates of the quantities of desalinated product water that would be delivered to CalAm's service area and returned to the SVGB. The demand and supply information presented below is based on data provided in CalAm's January 2013 supplemental testimony, as updated or revised by CalAm since then. The information below also includes relevant supply and demand data collected independently from other sources such as the Monterey Peninsula Water Management District (MPWMD).

CalAm is proposing this project to replace part of its existing water supplies, which have been constrained by legal decisions affecting CalAm's diversions from the Carmel River and pumping from the Seaside Groundwater Basin. State Water Resources Control Board (State Water Board) Order 95-10, State Water Board Order 2009-0060 and State Water Board Order 2016-0016 (also referred to as the 2009 and 2016 Cease and Desist Orders [CDOs], or 2009 and 2016 CDOs, respectively), and the Monterey County Superior Court's adjudication of the Seaside Groundwater Basin in 2006 substantially reduced CalAm's rights to use these two primary sources of supply. Section 2.2 provides background on CalAm's existing water system and historical sources of supply as well as information about the State Water Board and Superior Court decisions. Section 2.3 discusses the components of demand that CalAm proposes to meet with the proposed project in conjunction with CalAm's portfolio of other water supply sources, and Section 2.4 describes the water supply sources that would be used to meet those demands. Section 2.5 describes other factors that could affect future water supplies and demand in the Monterey District. Section 2.6 discusses the topic of water rights as it pertains to project feasibility.

2.2 Background

2.2.1 Existing Water System

The proposed project would develop supplemental water supplies to serve CalAm's Monterey District service area (Monterey District). CalAm's Monterey District encompasses most of the Monterey Peninsula, including the cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside; the Monterey Peninsula Airport District; and the unincorporated

2 Public Utilities Code Section 1001 et seq. requires that investor-owned utilities seeking to build certain specified infrastructure obtain a Certificate of Public Convenience and Necessity from the CPUC demonstrating that the proposed infrastructure is necessary for the service, accommodation, convenience, or safety of the public.

3 Refer to Section 2.5.1 and Section 2.6 for more information on SVGB return water.

areas of Carmel Highlands, Carmel Valley, Pebble Beach, and the Del Monte Forest. The Monterey District's main distribution system is located within these areas. The main system primarily relies on water supplies from the Carmel River and groundwater from the Coastal subarea of the Seaside Groundwater Basin. CalAm's Monterey District also includes five small satellite water systems along the Highway 68 corridor east of the City of Monterey: the Ryan Ranch, Bishop, Hidden Hills, Toro, and Ambler systems. Because the Toro and Ambler areas would not be served by the proposed project, these areas are not included in the proposed project's demand and supply assumptions.[4]

2.2.1.1 Existing Water Supply Facilities

Facility Overview

CalAm's existing Monterey District water supply infrastructure includes the following:

- extraction wells in the Carmel Valley Alluvial Aquifer
- groundwater production wells in the Seaside Groundwater Basin
- a surface water reservoir on the Carmel River[5]
- Aquifer Storage and Recovery (ASR) facilities
- various water treatment facilities
- a conveyance and distribution system consisting of over 500 miles of pipelines and water mains ranging in size from 2 to 36 inches in diameter
- a portion of the supply produced by Sand City's 300 afy Coastal Desalination Plant

The majority of the Monterey District water supply comes from 21 extraction wells screened[6] in the upper alluvial deposits of the Carmel River in Carmel Valley known as the Carmel Valley Alluvial Aquifer. CalAm's supply also includes groundwater production wells in the Seaside Groundwater Basin. Monterey District water supplies are generally treated to remove iron, manganese, and hydrogen sulfide, to control corrosion, and to adjust pH. Sodium hypochlorite is used for primary and secondary disinfection at each treatment facility that provides water to the distribution system.

Distribution and Conveyance

The CalAm Monterey District's distribution and conveyance system is an assemblage of smaller systems that have merged over time, starting with the Carmel Valley and Monterey Peninsula areas and eventually expanding to include the Seaside, Del Rey Oaks, and Sand City areas. The system encompasses several distinct urban areas and water pressure zones and is divided into four distinct districts:

[4] There is an existing emergency interconnection between the Toro and Hidden Hills systems; the project would not change the use of this emergency interconnection.

[5] Until recently CalAm operated two reservoirs on the Carmel River, the San Clemente and the Los Padres Reservoirs. Section 2.2.2 provides additional information on these reservoirs.

[6] A well screen is a filtering device that serves as the intake portion of wells constructed in unconsolidated or semi-consolidated aquifers. The screen permits water to enter the well from the saturated aquifer, prevents sediment from entering the well, and serves structurally to support the aquifer material.

- Upper Carmel Valley
- Lower Carmel Valley and Monterey Peninsula
- Seaside
- Upper Lift Zones

Water produced from wells along the upper and lower reaches of the Carmel River in the Carmel Valley is conveyed in two directions: westward and clockwise around the Monterey Peninsula to the city of Monterey; and northward over the hills via the Segunda Reservoir, Segunda Pipeline, Segunda Pump Station, and Crest Tank facilities to the city of Seaside.

2.2.2 Historical Sources of Supply

2.2.2.1 Carmel River

San Clemente Dam was built on the upper Carmel River in 1921 to form the San Clemente Reservoir. Surface water diverted at San Clemente Dam was the sole water supply for the Monterey Peninsula until the 1940s. Starting in the 1940s and continuing into the early 1990s, multiple production wells were installed in the Carmel Valley Alluvial Aquifer along the lower reach of the Carmel River. In 1949, Los Padres Dam, which forms Los Padres Reservoir, was built about 6 miles upstream of San Clemente Dam to control the inflow of water into San Clemente Reservoir. CalAm has owned and operated both reservoirs since 1966. Over the years, sediment that accumulated behind San Clemente and Los Padres Dams significantly reduced the usable storage in both reservoirs. As a result, by 1995 CalAm relied primarily on the multiple wells in the alluvial aquifer along the lower Carmel River for its Carmel River supplies and more recently CalAm has relied entirely on these wells for its Carmel River supply. The San Clemente Dam was removed in 2015, after two years of construction work to reroute the river and prepare the site for dam removal, and the Carmel River currently flows around the former dam site (California Coastal Conservancy, National Marine Fisheries Service, CalAm, et al., 2016). Summer releases from the Los Padres Reservoir continue to recharge a portion of the Carmel Valley Alluvial Aquifer and maintain fish habitat between the Los Padres Dam and San Clemente Dam site. MPWMD and CalAm are currently studying options for use or removal of the Los Padres Reservoir (MPWMD, 2015a; CalAm et al., 2016a).[7]

2.2.2.2 Seaside Groundwater Basin

In addition to Carmel River supplies, CalAm operates several production wells for its main system in the Coastal subarea of the Seaside Groundwater Basin. The Seaside Groundwater Basin, which encompasses 24 square miles and consists of several subareas, is generally bounded by the Pacific Ocean to the west, the Salinas Valley to the north, the Toro Park area to the east, and Highways 68 and 218 to the south.

[7] The CPUC's General Rate Case for 2015-2017 authorized CalAm to co-fund studies with the MPWMD to develop a long term management plan for the Los Padres Dam and Reservoir, and in April 2016 the MPWMD approved a contract for preparation of the first such study, a Los Padres Dam fish passage study (MPWMD, 2016a). In January 2017, the MPWMD approved a contract for preparation of an alternatives study for Los Padres Dam and sediment management in the reservoir (MPWMD, 2017).

East of the main system along the Highway 68 corridor, in the Laguna Seca subarea of the Seaside Groundwater Basin, CalAm operates wells that supply the Ryan Ranch, Bishop, and Hidden Hills satellite systems (WSC, 2012). CalAm also provides Carmel River water to the Ryan Ranch system during fires and emergencies via an emergency interconnection between the Crest Tank and Ryan Ranch. In addition, in June 2015 MPWMD approved CalAm's application for an interconnection between the Bishop and Ryan Ranch systems that would allow water to be conveyed from the Bishop system to Ryan Ranch for emergency use only (i.e., when Ryan Ranch supplies were insufficient to meet demand) (MPWMD, 2015b). As a result of the adjudication of the Seaside Groundwater Basin (see Section 2.2.4), these satellite systems will lose all of their allocated Seaside Groundwater Basin supplies by 2018. Therefore, the demand assumptions presented below in Section 2.3 include demand for the Ryan Ranch, Hidden Hills, and Bishop systems. (See Section 3.2.3.9 and Figures 3-2 and 3-10a and 3-10b in Chapter 3, Project Description, regarding interconnections proposed as part of the MPWSP to enable water delivery to these small systems when CalAm no longer has rights to pump from the Laguna Seca subarea.)

CalAm's Toro and Ambler satellite systems lie east of the Laguna Seca subarea, on the south side of Highway 68. There are no existing or proposed direct infrastructure interconnections between CalAm's main system and the Toro and Ambler systems, which rely on groundwater supplies from the Corral de Tierra Subbasin of the SVGB. There is an existing emergency interconnection between the Hidden Hills and Toro systems.

2.2.2.3 Allocation Program

The MPWMD augments, manages, and regulates surface and groundwater resources in the Carmel Valley and the greater Monterey Peninsula. MPWMD's jurisdiction includes the area served by CalAm's Monterey District (shown in **Figure 3-1** in Chapter 3, Description of the Proposed Project) and CalAm's sources of supply (the Seaside Groundwater Basin and Carmel Valley Alluvial Aquifer), which MPWMD defines as the Monterey Peninsula Water Resource System (MPWMD, 2015b). The Monterey Peninsula Water Resource System includes supplies for non-CalAm pumpers in the Seaside Basin and Carmel Valley Alluvial Aquifer, as well. The MPWMD was established by state statute in 1978 to provide integrated management of all water resources for the Monterey Peninsula; among its functions is the allocation of water supply within its boundaries. MPWMD's initial, interim allocation, adopted in 1981, set CalAm's production limit (from the Carmel River system and the Coastal subarea of the Seaside Groundwater Basin) at 20,000 acre-feet (af), of which a net of 18,600 af was allocated among the jurisdictions in CalAm's service area. With the adoption of its current allocation program in 1990, MPWMD set CalAm's production limit at 16,744 afy. MPWMD has adjusted CalAm's production limit several times since then, most recently in 1997 when it set the production limit at 17,641 afy. Before the 2006 adjudication of the Seaside Groundwater Basin (described below in Section 2.2.4), the MPWMD assumed CalAm's yield from the Coastal subarea of the Seaside Groundwater Basin to be 4,000 afy (MPWMD, 2006a). In 2008, MPWMD expanded the regulated area it defines as the Monterey Peninsula Water Resource System to include the Laguna Seca subarea of the Seaside Groundwater Basin (through adoption of MPWMD Ordinance 135).

2.2.2.4 Carmel River Flow Agreements

In addition to MPWMD's allocation program and State Water Board Orders 95-10, 2009-0060, and 2016-0016 (discussed below in Section 2.2.3), CalAm's use of its Carmel Valley wells is also restricted by agreements with state and federal wildlife agencies.

California Department of Fish and Wildlife Annual Memorandum of Agreement

An annual Memorandum of Agreement (MOA) developed and entered into each year by CalAm, MPWMD, and the California Department of Fish and Wildlife provides an annual guideline to minimize localized drawdown from the use of wells located along certain reaches of the Carmel River, and limits surface water diversions from April to October. Before the San Clemente Dam was removed, the MOA specified minimum releases to the river from San Clemente Reservoir (CalAm, 2007). In 2015 the parties established minimum flow targets below the Los Padres Dam, which were expected to produce estimated minimum flows at the gaging station near the San Clemente Dam site (MPWMD, 2015c).

U.S. Fish and Wildlife Service and National Marine Fisheries Service (NMFS) Agreements

Two species listed as threatened under the Endangered Species Act, the California red-legged frog and the South-Central California Coast distinct population segment of steelhead (S-CCC steelhead), inhabit the Carmel River.[8]

- The California red-legged frog was listed as threatened under the Federal Endangered Species Act (ESA) in 1996. In 1997, the U.S. Fish and Wildlife Service (USFWS) issued an ESA-4(d) rule that allowed it to prosecute for "take"[9] of the frog.
- The S-CCC steelhead was listed as threatened under the ESA in 1997, reaffirming that status in 2006 and 2014. In 2000 NMFS issued an ESA-4(d) rule allowing it to prosecute for take of steelhead, and revised it in 2005.

USFWS and NMFS have taken the position that any entity that pumps water from the Carmel Valley Aquifer may be liable for a take because the pumping may alter the habitat, affect the steelhead's ability to migrate in the river, and affect the frog's ability to grow to maturity. In 1997, CalAm entered into an agreement with USFWS to further regulate its well production activities in an attempt to avoid or mitigate impacts on the frog and has renewed that agreement several times. In 2001, CalAm negotiated a Conservation Agreement with NMFS that included various changes in operations, with the long-term goal of procuring an alternative water supply source to reduce withdrawals from the Carmel River Alluvial Aquifer. In 2009, Cal-Am entered into a Settlement Agreement with NOAA that updated the expired 2001 Conservation Agreement. In 2017, CalAm entered into a Memorandum of Agreement with NMFS that incorporates provisions of the 2009 Settlement Agreement and requires additional measures to conserve S-CCC steelhead.

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8 Refer to Section 4.6, Terrestrial Biological Resources in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, for more information on biological resources in the project area.

9 As defined in the ESA, to "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

If CalAm fails to satisfy USFWS and NMFS concerns regarding ESA, those agencies could bring enforcement actions against CalAm and its customers. The consequences could include further reduction of the water supply obtained from the Carmel Valley Alluvial Aquifer, and fines that could be in the millions of dollars.

2.2.3 State Water Board Order 95-10 and Cease and Desist Orders 2009-0060 and 2016-0016

State Water Board Order 95-10, issued in July 1995, substantially limited the supplies available to CalAm from the Carmel River. In the order, the State Water Board established that CalAm has a legal right to 3,376 afy (equivalent to about 3 mgd) from the Carmel River system, including surface water diversions from the river and subsurface flow pumped from the Carmel Valley Alluvial Aquifer. Prior to Order 95-10, CalAm's average annual use during non-drought years was approximately 14,106 afy (12.6 mgd).[10] The order found that CalAm was diverting approximately 10,730 afy of surface and/or subsurface flow from the Carmel River without a valid basis of right and directed CalAm to diligently undertake the following actions to terminate its unlawful diversions: obtain appropriative rights to the Carmel River water that was being unlawfully diverted; obtain water from other sources and make one-for-one reductions of the unlawful diversions; and/or contract with other agencies that had appropriative rights to divert and use water from the Carmel River. Order 95-10 directed CalAm, during its pursuit of an alternative supply, to implement conservation measures to offset 20 percent of demand[11] and restricted CalAm to an annual diversion of 11,285 afy (10.1 mgd) from Carmel River sources. This amount represented a 20 percent reduction from CalAm's average usage at the time of 14,106 afy. The order also prohibited CalAm from diverting water from San Clemente Dam when streamflows reach a predetermined low flow. The order directed CalAm to maximize use of the Seaside Groundwater Basin for the purpose of serving existing connections, honoring existing commitments (allocations), and to reduce diversions from the Carmel River to the greatest practicable extent (State Water Board, 1995).[12]

In October 2009, the State Water Board adopted Cease and Desist Order 2009-0060, based on the State Water Board's conclusion that Order 95-10 did not authorize CalAm to divert water from the Carmel River in excess of its water rights and that CalAm was illegally diverting water from the Carmel River in violation of Order 95-10 and Water Code Section 1052. The CDO requires that CalAm "diligently implement actions to terminate its unlawful diversions from the Carmel River and … terminate all unlawful diversions from the river no later than December 31, 2016." The CDO prohibits CalAm from diverting water from the Carmel River for new service connections or intensified water use at existing connections, and required CalAm to reduce diversions by 5 percent, or 549 afy, starting in October 2009, with further annual reductions

[10] 14,106 afy was CalAm's average use of Carmel River water from 1979 to 1988, according to Order 95-10 (citing information provided by CalAm).

[11] Order 95-10 required a conservation reduction, in combination with conservation measures required by the MPWMD, of 15 percent in the 1996 water year and a reduction of 20 percent in each subsequent year.

[12] Water supply projects that were considered by CalAm and the CPUC in response to Order 95-10 prior to the currently proposed project are described in Chapter 5, Alternatives Screening and Analysis.

starting in October 2011 and "continu[ing] until all unlawful CalAm diversions from the river have been terminated" (State Water Board, 2009).

In July 2016 the State Water Board adopted Order WR 2016-0016, which amends Orders 95-10 and 2009-0060. Order 2016-0016 extends the date by which CalAm must terminate all unlawful diversions from the Carmel River from December 31, 2016, to December 31, 2021. The Revised CDO set an initial diversion limit of 8,310 afy for Water Year 2015-2016 (October 1, 2015-September 30, 2016) and establishes annual milestones that CalAm must meet in order to maintain the 8,310 afy diversion limit through 2021. The milestones would demonstrate tangible progress in developing alternative water supply that would enable CalAm to reduce and terminate its unlawful diversions. If CalAm fails to meet a milestone, the Revised CDO specifies that the annual diversion limit will be reduced by 1,000 afy. The Revised CDO also provides that "[i]f the State Water Board determines that the cause [for failing to achieve a milestone] is beyond Applicants' control, it may suspend any corresponding reductions under [the specified CDO condition] until such time as the Applicants can reasonably control progress towards the Milestone."[13] Section 5.4.2, No Project Alternative, provides further discussion on the CDO and the milestones.

2.2.4 Seaside Groundwater Basin Adjudication

Another purpose of the proposed project is to reduce CalAm's reliance on the Seaside Groundwater Basin, which is currently CalAm's other principal source of supply for the Monterey District. In March 2006, the Monterey County Superior Court issued a decision in *California American Water v. City of Seaside*, (Super. Ct. Monterey County, 2006, No. M66343), setting forth the adjudicated water rights of the various parties who produce groundwater from the Seaside Basin. The court amended that decision in February 2007.

In August 2003, CalAm sued a number of parties who held, or potentially held, water rights in the Seaside Groundwater Basin, and asked the court to adjudicate those rights. CalAm also asked the court to establish a plan for the coordination of groundwater management within the Seaside Groundwater Basin. Most of the defendants then cross-claimed against CalAm, and the Monterey Peninsula Water Management District and the Monterey County Water Resources Agency both intervened.

By adjudicating the water rights for all users of the basin, the court intended to protect the basin from long-term damage associated with potential seawater intrusion, subsidence, and other adverse effects that commonly result from overpumping. The Decision identified the "natural safe yield"[14] for the basin as a whole, and individually for the Coastal and Laguna Seca subareas, and found that production in each of the preceding 5 years had exceeded the natural safe yield throughout the basin and in each of its subareas. The Decision also found (and noted that all parties agreed) that continued production in excess of the natural safe yield would result in seawater intrusion and deleterious effects on the basin.

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13 Order WR 2016-0016 Schedule and Condition 3(b)(viii).

14 The Decision defines "natural safe yield" as the quantity of groundwater in the Seaside Basin that occurs solely as a result of natural replenishment. The estimate of natural safe yield assumes no action is taken to capture subsurface flow exiting the northern boundary of the basin.

The Decision established a physical solution to basin management that was intended to reduce aquifer drawdown to the level of the natural safe yield; to maximize potential beneficial uses of the basin; and to provide a means of augmenting water supply for the Monterey Peninsula. In addition to allocating groundwater rights to the various users, the Decision established an initial "operating safe yield," to be decreased incrementally over time until withdrawals are equal to the identified natural safe yield.[15] The Decision also established the Seaside Groundwater Basin Watermaster, consisting of representatives of the parties to the complaint, to administer and enforce the provisions of the Decision. CalAm's 2007 allocation under the initial operating safe yield was 3,504 afy from the Coastal subarea and 345 afy from the Laguna Seca subarea. CalAm's current (water year[16] 2016) operating yield allocation is 2,254 afy from the Coastal subarea and 48 af from the Laguna Seca subarea (Watermaster, 2015). CalAm's eventual allocation, when withdrawals pursuant to the adjudication equal the natural safe yield of the basin, will be 1,474 afy from the basin overall (Watermaster, 2009). Although this quantity was calculated based on the basin as a whole, by the time withdrawals have been reduced to equal the natural safe yield, the entire natural safe yield of the Laguna Seca subarea will be allocated to other producers with overlying groundwater rights that are superior to CalAm's appropriative rights (Svindland, 2013a); therefore, CalAm's adjudicated right to 1,474 afy from the basin will be drawn from the Coastal subarea.

Table 2-1 summarizes key determinations contained in the Decision and the initial and current production allocations prepared by the Seaside Groundwater Basin Watermaster (Watermaster, 2007, 2015). For comparison, Table 2-1 also shows CalAm's production from the Seaside Groundwater Basin prior to Order 95-10, CalAm's average production for the years following Order 95-10 prior to the adjudication, and the MPWMD allocation for CalAm prior to the adjudication.

The Decision also requires that production from the Seaside Groundwater Basin in excess of the natural safe yield (i.e., the difference between the natural safe yield and the interim operating yield limits) be replenished. CalAm and the Seaside Groundwater Basin Watermaster have agreed to a replenishment schedule of 25 years at a replenishment rate of 700 afy (Watermaster and CalAm, 2014). The replenishment volume, which may occur as in-lieu or artificial replenishment,[17] will be based on a running 5-year average. Based on this replenishment schedule, CalAm's proposed sizing of the MPWSP Desalination Plant assumes that, over the 25-year "repayment period," available supply from the Seaside Groundwater Basin will be limited to 774 afy (700 afy less than CalAm's adjudicated right of 1,474) (Svindland, 2013a).

[15] The Decision defines "operating safe yield" (also referred to as operating yield) as the maximum amount of groundwater resulting from natural replenishment that the Decision, based upon historical usage, allows to be produced from each subarea for a finite period of years, unless such level of production is found to cause material injury. In general, the initial operating yield for each subarea was to be maintained for the first three water years; starting in the fourth water year and triennially thereafter, it is to be decreased by 10 percent until the operating yield is equivalent to the subarea's natural safe yield.

[16] A water year runs from October 1 through September 30 of the following year, and is named for the year it ends. For example, water year 2016 extends for October 1, 2015, through September 30, 2016.

[17] "In-lieu replenishment" refers to programs in which groundwater producers agree to refrain, in whole or in part, from exercising their right to produce their full production allocation with the intent to replenish the Seaside Groundwater Basin through forbearance, in lieu of injection or spreading of non-native water. "Artificial replenishment" refers to the addition of non-native water to the groundwater supply of the Seaside Groundwater Basin, through spreading or direct injection, to offset cumulative over-production from the basin (Monterey County Superior Court, 2007).

TABLE 2-1
SEASIDE GROUNDWATER BASIN ADJUDICATED OPERATING AND NATURAL SAFE YIELDS WITH CALAM'S PRE-ADJUDICATION PRODUCTION

Basin Management Element	Quantity
Initial operating safe yield – entire basin	5,600 af[a]
Total initial (2007) operating safe yield – Coastal subarea (CalAm and other producers)	4,611 af[a]
CalAm's initial (2007) standard production allocation of operating safe yield – Coastal subarea	3,504 af[b]
CalAm's current (water year 2016) operating yield allocation – Coastal subarea	2,254 af
Total initial (2007) operating safe yield – Laguna Seca subarea	989 af[a]
CalAm's initial (2007) standard production allocation – Laguna Seca subarea	345 af[b]
CalAm's current (water year 2016) operating yield allocation – Laguna Seca subarea	48 af
Natural safe yield – entire basin	2,581 – 2,913 afy
Natural safe yield – Coastal subarea	1,973 – 2,305 afy
Natural safe yield – Laguna Seca subarea	608 afy
Natural safe yield – CalAm's eventual allocation – entire basin	1,474 afy[c]
MPWMD allocation for CalAm for the Coastal subarea prior to the adjudication[d]	4,000 afy
CalAm Seaside Basin production when Order 95-10 was issued	2,700 afy
CalAm average annual production, water years 1996–2006, Coastal subarea	3,695 afy
CalAm average annual production, water years 1996–2006, Laguna Seca subarea	432 afy

NOTES: af = acre feet; afy = acre feet per year.

a The initial operating safe yield was established for the first three water years (changed from administrative years in the 2007 Amended Decision); at the beginning of the fourth water year and triennially thereafter, it is to be decreased by 10 percent until it is equivalent to the natural safe yield. The adjudication provides for possible revisions of the established operating safe yield based on the findings of the Seaside Groundwater Basin Watermaster.

b CalAm's initial standard production allocations are based on the table, "Seaside Basin Groundwater Account Per Amended Decision, Dated February 9, 2007," prepared by the Seaside Groundwater Basin Watermaster.

c This Seaside Groundwater Basin Watermaster estimate (Watermaster, 2009) revises the MPWMD's 2006 estimate that CalAm's eventual allocation would be 1,494 afy from the Coastal subarea and zero from the Laguna Seca subarea. Because other Laguna Seca subarea producers have water rights that are superior to those of CalAm, the entire natural safe yield of the Laguna Seca subarea will be allocated to other producers (Svindland, 2013a, pp. 16–17); therefore, CalAm's adjudicated right to 1,474 afy at natural safe yield would be drawn from the Coastal subarea.

d At the time, MPWMD's definition of the Monterey Peninsula Water Resource System did not include the Laguna Seca subarea; therefore, a corresponding allocation was not provided for that subarea.

SOURCES: Monterey County Superior Court, 2007; MPWMD, 2006a; Watermaster, 2007, 2009, 2015; State Water Board, 1995; Svindland, 2013a.

2.3 CalAm Service Area Demand

Based on State Water Board Orders 95-10, 2009-0060, and 2016-0016 and the Seaside Groundwater Basin adjudication, CalAm must develop a replacement water supply to meet existing demand in its Monterey District service area. CalAm's existing demand includes existing water service required by existing customers as well as demand associated with existing Pebble Beach water entitlements in the Del Monte Forest area, as described below. In addition, CalAm proposes to provide sufficient supply to meet demand associated with the development of existing legal lots of record and tourism demand under improved economic conditions within its service area.

2.3.1 Existing System Demand

2.3.1.1 Annual Demand

Annual demand for CalAm's Monterey District main system plus the Bishop, Ryan Ranch, and Hidden Hills satellite systems between 2006 and 2015 is shown in **Table 2-2**. Average annual demand over this period was 12,351 afy. This estimate of average annual demand is about 940 afy lower than the estimated service area demand CalAm provided in its 2013 testimony (13,291 afy) based on years 2007 through 2011.

TABLE 2-2
EXISTING DEMAND[a] 2006–2015 (acre-feet)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Annual[b] Demand	14,176	14,596	14,439	13,198	12,270	12,129	11,549	11,356	10,250	9,545
10-Year Average (2006-2015): 12,351										

NOTES:
[a] Demand values are for the Monterey District main system plus the Ryan Ranch, Hidden Hills, and Bishop satellite water systems.
[b] Demand shown is for the calendar year.

SOURCE: California American Water, 2016b

CalAm anticipates that by the time the desalination plant is operational, the average 10-year and maximum year demand will be lower than the current 10-year average, most notably due to the continuing decline in per capita water use. As discussed below in Section 2.3.1.2, CalAm has concluded that demand in 2010, 12,270 afy, represents an appropriate estimate of annual demand for CalAm to use in assessing the adequacy of its water supplies to meet peak demands and regulatory supply capacity requirements.

2.3.1.2 Peak Demands

While annual water demand characterizes the overall system demand expected to occur within a service area, actual water use fluctuates over the course of a day, month, season, and year. For example, people use less water in the middle of the night and more around dinnertime; they use more during the warmer and drier months and seasons than in the cooler and wetter ones; and they typically use more in dry years than in average or wet years – at least until conservation measures kick in. The California Department of Public Health's California Waterworks Standards[18] require that public water system's water sources have the capacity to meet the system's maximum day demand and (for systems with 1,000 or more service connections) peak hour demand, and specify that maximum day demand and peak hour demand are to be determined based on the most recent ten years of operation. CPUC General Order 103-A also requires that water utilities within its jurisdiction meet these standards. CalAm considers peak month demand a more critical consideration for its operations than peak day demand because the Monterey District's portfolio of supplies provides sufficient flexibility to meet such short term peak

[18] California Code of Regulations Title 22, Division 4, Chapter 16, Section 64554.

demand. By contrast, peak month demand represents more sustained elevated demand, over multiple days, which needs to be considered as a factor in plant sizing (Svindland, 2013b). CalAm hopes to bring the desalination plant on line in 2020. By that time, the 10-year demand record would cover the period from 2010 through 2019, and the 2007, 2008 and 2009 demands will have dropped off the 10-year historical record period. CalAm assumes that demand in years 2016 through 2019 will not exceed demand in 2010 and that 2010 would, therefore, represent the maximum-demand year for this period (Svindland, 2016). CalAm also assumed that peak month demand in 2010 (July 2010), which was the highest month demand of the years 2010 through 2015, adequately represents peak month demand for planning purposes.

2.3.1.3 Pebble Beach Water Entitlements

In 1989, the MPWMD granted water entitlements totaling 380 afy to the Pebble Beach Company and two other fiscal sponsors for underwriting the development of a wastewater reclamation project that is estimated to save substantially greater amount of potable water. The wastewater reclamation project was jointly undertaken by the Carmel Area Wastewater District, the Pebble Beach Community Services District, and the MPWMD to provide recycled water in lieu of potable water to golf courses in the Del Monte Forest, which includes Pebble Beach. The MPWMD subsequently authorized the Pebble Beach Company to sell a portion of the remaining water entitlements to other Del Monte Forest property owners as a means of financing part of the project. The project now provides 100 percent of the irrigation water for all of the golf courses and some open space areas in the Del Monte Forest. The MPWMD estimates that the project saves approximately 1,000 afy of potable water (Stoldt, 2011).

Recognizing that the wastewater project reduced demand on the Carmel River by more than the amount of the water entitlements, SWRCB has stated that the 380 afy represented by the water entitlements is available to serve the Del Monte Forest properties when they are developed and that increased diversions from the Carmel River by CalAm to satisfy the Pebble Beach entitlements would not be counted as part of CalAm's diversion limit but instead added to the adjusted base against which CalAm's compliance was measured. Likewise, the properties developed using these entitlements would not be subject to the prohibition on new service connections contained in the SWRCB CDOs (Anton, 1998; SWRCB, 2009; SWRCB, 2016). As stated in Order 2016-0016, CalAm must terminate all illegal diversions from the Carmel River by December 31, 2021 and thus may not serve the Del Monte Forest properties using illegal diversions from the river after that time. However, the water entitlements constitute an existing commitment by MPWMD and obligation to serve by CalAm when the properties are developed, and are therefore considered part of CalAm's existing demand.

Of the 380 afy, entitlements totaling about 325 afy had not been used (i.e., had not been exchanged for water permits allowing actual water system connections) at the time CalAm revised its estimate of system demands in 2013; the remaining unused entitlements represented water demand that was not reflected in the existing demand figures shown in Table 2-3.

As of the end of 2012, MPWMD reported it had issued water permits totaling 58.419 afy and that remaining Pebble Beach water entitlements totaled 321.581 afy (MPWMD, 2013a). Testimony by the MPWMD during the CPUC proceedings on the proposed MPWSP in February 2013 confirmed these figures and noted that a portion of the 58.419 afy of issued permits had probably not yet been connected to the CalAm system. The MPWMD testimony concluded that the estimated 325 afy of demand associated with the Pebble Beach water entitlements was reasonable (Stoldt, 2013). Since 2013, MPWMD has issued additional water permits associated with the Pebble Beach water entitlements and, as of May 2016, the remaining entitlement for all Pebble Beach entitlement holders stood at 303.768 afy (MPWMD, 2016b). Because the recently issued permits may not immediately translate to water connections and water use, the estimate of 325 afy should remain a reasonable estimate of the portion of the Pebble Beach entitlements not reflected in existing system demands.

2.3.2 Other Service Area Demand Assumptions

In addition to meeting existing annual demand and demand associated with the Pebble Beach water entitlements, CalAm proposes that the MPWSP be sized to provide, in conjunction with other supply sources, sufficient supplies to also meet the water demands associated with the anticipated economic recovery (or “rebound”) of the local hospitality industry, resulting in increased water demand by existing businesses compared to current levels, and demand associated with the development of existing legal lots of record in jurisdictions served by the project (Svindland, 2013a). **Table 2-3** shows existing system demands together with demands associated with economic recovery and lots of record, which total approximately 1,680 afy; these demand components are discussed further below.

TABLE 2-3
OTHER DEMAND ASSUMPTIONS

Demand Component	Annual Demand (acre-feet)
Existing Annual Service Area Demand	12,270
Pebble Beach Water Entitlements	325
Hospitality Industry Rebound Economic Recovery	500
Legal Lots of Record	1,180
Total to Service Area	**14,275**

SOURCE: RBF Consulting, 2013; Svindland, 2016.

2.3.2.1 Hospitality Industry Rebound

The hospitality industry, which includes hotels, restaurants, and other visitor-serving businesses, experienced reductions in occupancy and visitation rates during the economic recession that began in late 2007. Since then, the industry has been recovering slowly: industry representatives expect that occupancy and visitation rates will soon rebound to pre-recession levels. So they feared that CalAm's previous demand estimate, which was based on recession-era numbers, would not accurately reflect demand in a healthy economy. In response to this concern, CalAm’s January 2013 revised demand estimate allocated an additional 500 afy to meet demand associated with the future rebound of the local hospitality industry (Svindland, 2013a). CalAm based its estimate on discussions with hospitality industry representatives in the region (RBF, 2013) without providing additional documentation. As discussed below, MPWMD conducted its own assessment of CalAm's estimate using available data (MPWMD, 2013b). The MPWMD compared occupancy and water-use levels for several periods over the last 15 years, finding that the average occupancy level in 2011 was just below 68 percent (compared to 75 percent for the period of 1998 through 2001, when the economy was robust). The analysis noted that if the economy improved, occupancy rates would go up, and the demand for water would rise. So the proposed project should be sized to accommodate an increase in water use. The MPWMD's comparison of commercial-sector water use found that:

- Average annual demand in 2000 was about 440 afy greater than the average annual demand for 2009 through 2011;
- Average annual demand for 2006 through 2008 was 236 afy greater than the average annual demand for 2009 through 2011; and
- A 7 percent increase in the average annual demand in 2009 through 2011 (based on the 7 percent difference in occupancy rates between the 1998–2001 period and 2011) would increase water demand by 194 afy.

The MPWMD's direct testimony to the CPUC in February 2013 concluded that CalAm's estimate of demand related to tourism rebound was reasonable (Stoldt, 2013).[19]

CalAm's 2016 amended application and the testimony supporting it updated the existing service area demand estimate, providing information on average 10-year demand over the period 2006 through 2015, and using demand in 2010 as the basis for its analysis of system operations and the adequacy of anticipated supplies under the project. As in 2013, CalAm's current estimate of system demand includes 500 afy to meet future demand of the existing hospitality industry under recovered conditions. While the current estimate is based on consideration of a longer time frame, and while the region has recovered to some degree from the economic recession, the 10-year period CalAm considered for its demand estimate includes the past four years of drought, during which water use has dropped significantly. Therefore, even if the region's economy has largely recovered, water demand of existing businesses reflected in recent demand data may be lower than would be expected under normal weather conditions. As discussed in more detail in Section 6.3, Growth Inducement, this EIR/EIS assumes that some of the economic recovery for which this 500 afy CalAm estimate is intended has already occurred, and that some of this supply would be available for other uses.

2.3.2.2 Lots of Record

CalAm has repeatedly testified that the proposed project would also provide an estimated 1,181 afy of water to meet demand resulting from the development of vacant legal lots of record in the service area (Svindland, 2012; 2013a; 2016). CalAm had previously included this demand estimate in its

[19] For additional review of CalAm's estimate of this component of demand refer to Section 6.3, Growth Inducement. Refer to Section 2.6 of this chapter regarding assumptions about the allocation of water supply provided by the MPWSP.

2006 *Urban Water Management Plan* (Management Plan). The 2006 Management Plan cited a 2001 analysis by MPWMD staff as the source for the estimate of 1,181 afy (CalAm, 2006).

In February 2013, the MPWMD reviewed its analyses of water demand related to legal lots of record and found no documentation to support the 1,181 afy estimate. The summary of the results of the documentation review, prepared for the MPWMD Board of Directors (MPWMD, 2013c), defines a legal lot of record as "a lot resulting from a subdivision of property in which the final map has been recorded in cities and towns, or in which the parcel map has been recorded in Parcels or Maps or Record of Surveys. Not all legal lots are buildable."[20] The summary states that "[t]he District does not certify that the estimate of 1,181 afy [for demand associated with vacant lots of record] is a valid value" and does not recommend its continued use.

The summary identifies two reports on the topic of lots-of-record water demand that were prepared for the MPWMD in 2000 and 2002, and notes that the 2001 estimate cited in CalAm's 2006 Management Plan was from an interim period between these two reports. The 2000 report, which had identified demand of 1,166.3 afy for vacant lots and remodels, was not adopted by the MPWMD Board because it did not include estimates for the city of Monterey or the unincorporated county; the revised 2002 report, which identified demand of 1,211 afy, included estimates for the city of Monterey but not for the unincorporated county (MPWMD, 2013c). The MPWMD's direct testimony to the CPUC in February 2013 reiterated these observations, stating that the MPWMD does not consider the 1,181 afy estimate a valid value and that the higher 2002 estimate did not account for vacant lots on improved parcels in the unincorporated areas (Stoldt, 2013). While MPWMD testified that CalAm's estimate may therefore underestimate the actual demand for lots of record (Stoldt, 2013), MPWMD observed in 2017 that development of lots of record has occurred since the estimates were prepared in the early 2000s and that some vacant lots on improved parcels that were included in MPWMD's vacant lot study may never be split from the main property and developed (MPWMD, 2017). Whether development of lots of record since the early 2000s has offset, or more than offset, the number of uncounted lots that should have been included in the 2002 study, and by how much, cannot be determined from available data.

Another factor affecting the estimate of demand associated with lots of record is water use rates. Comment on the 2015 MPWSP Draft EIR suggested that water demand per lot has likely decreased in years since those reports were prepared. It may be the case that per-lot water demand is somewhat lower than 15 years ago, considering the general trend in lower per capita demand in the service area and throughout the state; however, the extent of such reductions may not be quantifiable based on available data. (Refer to Section 6.3, Growth Inducement, for additional discussion of this demand component.)

[20] An exhibit filed in conjunction with MPWMD testimony in December 2013 states that "[i]t is generally considered that [legal lots of record] are considered buildable by, and have the approval of, the local land use jurisdiction.…" (MPWMD, 2013d).

2.3.3 2010 Urban Water Management Plan Demand Estimates

Under the Urban Water Management Planning Act,[21] CalAm is required to provide information on existing and projected future demand in the Monterey District. The information presented in CalAm's 2010 Management Plan, which was completed in September 2012 (WSC, 2012), is summarized here for informational purposes. The Urban Water Management Planning Act requires all urban water suppliers to prepare a Management Plan (and update it every 5 years) for the purpose of "actively pursu[ing] the efficient use of available supplies." As part of their long-range planning, urban water suppliers must make every effort to meet their customers' needs during normal, dry, and multiple dry water years. So although CalAm did not cite the 2010 Management Plan as the basis for the proposed project's demand estimates, the evaluation of service area demands presented in the Management Plan provides insight into CalAm's expectations regarding population growth and water demand in the Monterey District using a different projection methodology from that used for the proposed MPWSP (summarized above in Sections 2.3.1 through 2.3.3).

2.3.3.1 Urban Water Management Plan Service Area Population

Senate Bill 7, enacted in November 2009,[22] requires all water suppliers in the state to increase water use efficiency. In particular, urban water suppliers must achieve a 20 percent reduction in urban per-capita water use by 2020, and must include in their 2010 Management Plans their baseline per-capita water use; their 2020 per-capita water use target; and an interim (2015) per-capita water use target. Consequently, CalAm performed an assessment of its service area population to calculate per-capita water use and project future service area demands for its 2010 Management Plan.

To determine the population of the Monterey District, which includes portions of unincorporated Monterey County, CalAm took geographic information system (GIS) shapefiles containing 2010 population data by census block obtained from the U.S. Census Bureau, compared those data with their service area boundaries, and determined how much of the service area was within each census block. Based primarily on the area of the Monterey District within each census block,[23] the 2010 Management Plan analysis estimated the population of each of the Monterey District's distribution systems and the District as a whole. The Management Plan indicates that the population of CalAm's entire Monterey District was 99,396 in 2010 and that the combined population of the main system and the Bishop, Hidden Hills, and Ryan Ranch satellite distribution systems, which would also be served by the proposed project, was 95,972. The Management Plan estimated future population growth for each distribution system based on the Association of Monterey Bay Area Governments' 2008 forecast, which the Management Plan analysis adjusted to incorporate 2010 census data (WSC, 2012).

[21] California Water Code Section 10610 et seq.

[22] Codified at California Water Code Sections 10608 and 10800–10853.

[23] The UWMP population analysis found that, for the most part, population distribution was generally uniform within each census block; where population was not uniformly distributed, the distribution was adjusted based on visual inspection of recent aerial photographs.

2.3.3.2 Urban Water Management Plan Demand Estimates

According to the CalAm 2010 Management Plan, total water use – that is, water delivered to customers and non-revenue water[24] – in the Monterey District in 2010 was 12,809 af. Total water use in the main system and the Bishop, Hidden Hills, and Ryan Ranch satellite systems in 2010 was 12,270 af. The Management Plan presents CalAm's calculation of baseline, interim (2015) target, and 2020 target per-capita water use rates for the Monterey District as required by Senate Bill 7: the baseline, 2015, and 2020 per-capita use rates are 144, 131, and 118 gallons per-capita per day (gpcd), respectively. But the Monterey District's actual 2010 per-capita water use was 115 gpcd, which was less than its 2020 reduction target, and the Management Plan projections of future water demand between now and 2030 assumed the 115 gpcd rate.

The 2010 Management Plan estimates of non-revenue water are based on information CalAm submitted to the CPUC. The Management Plan indicates that non-revenue water for the Monterey main system decreased from 2,332 afy in 2005 to 1,389 afy in 2010 and was projected to decrease to 1,251 afy in 2030. Non-revenue water data for the satellite systems are not provided for 2005. In 2010, non-revenue water for the main system plus the Bishop, Hidden Hills, and Ryan Ranch satellite systems was 1,445 afy and was projected to decrease to 1,290 afy in 2030. (Refer to Section 2.5.3.3, below, for additional discussion of non-revenue water.)

The 2010 Management Plan projects total water demand in the Monterey District in 2030 to be 13,936 afy, and projects total demand in the main system and the Bishop, Hidden Hills, and Ryan Ranch satellite systems to be 13,544 afy (WSC, 2012). This amount is less than CalAm's current demand estimate for the proposed project service area (14,275 afy) and the supply that would be provided with implementation of the proposed project in conjunction with Carmel River, Seaside Groundwater Basin, and other assumed supplies (discussed in Section 2.4). Demand assumed for the MPWSP differs from that of the Management Plan because CalAm determined that an additional supply and demand analysis was needed to address the repayment of the Seaside Groundwater Basin, the potential for tourism in the area to recover, the Pebble Beach water entitlements, and water for lots of record. These factors are included in CalAm's current assumptions regarding service area demand, as described in Section 2.3.3.

2.4 Available Supplies

Table 2-4 shows the individual supply sources, both with and without the GWR project.[25] These supply sources are described below. As the table shows, available supplies range from 16,211 afy to 16,994 afy, depending on whether the proposed 6.4 mgd or 9.6 mgd plant is built and whether Seaside Groundwater Basin replenishment is in progress or completed. The "Supply Available for Other Uses" in Table 2-4 is the difference between Total Supplies and Service Area Demand. It

[24] Non-revenue or unaccounted-for water refers to the difference between the total water produced in a system and the total water billed to customers (i.e., water consumed). Non-revenue water includes water lost to leaks in the distribution system, water use that is not billed or tracked in the system, such as water used for firefighting and system flushing, and unauthorized uses.

[25] The GWR project would convey advanced treated water from the Monterey Regional Water Pollution Control Agency to the Seaside Groundwater Basin, where it could be injected for storage and subsequent recovery by CalAm. MRWPCA, the Lead Agency for the GWR EIR certified the Final EIR and approved the GWR project in October 2015.

represents water from the MPWSP that could be available for other uses, such as returning water to the Salinas Valley Groundwater Basin, or supporting growth. Both uses are discussed in Section 6.3, Growth Inducing Impacts.

TABLE 2-4
CALAM MONTEREY DISTRICT WATER SUPPLIES WITH PROPOSED MPWSP
(acre-feet per year)

	During Replenishment of the Seaside Groundwater Basin		After Replenishment of the Seaside Groundwater Basin	
Supply Source	**Without GWR (9.6 mgd[a] Desalination Plant)**	**With GWR (6.4 mgd[b] Desalination Plant)**	**Without GWR (9.6 mgd[a] Desalination Plant)**	**With GWR (6.4 mgd[b] Desalination Plant)**
Carmel River[c]	3,376	3,376	3,376	3,376
Seaside Groundwater Basin[d]	774	774	1,474	1,474
Aquifer Storage and Recovery (ASR)[e]	1,300	1,300	1,300	1,300
Sand City Coastal Desalination Plant[f]	94	94	94	94
Groundwater Replenishment Project (GWR)[g]	0	3,500	0	3,500
MPWSP Desalination Plant Production[h]	10,750	7,167	10,750	7,167
Total Supplies	**16,294**	**16,211**	**16,994**	**16,911**
Service Area Demand (from Table 2-3)	14,275	14,275	14,275	14,275
Supply Available for Other Use (Total Supplies Minus Service Area Demand)	**2,019**	**1,936**	**2,719**	**2,636**

NOTE: mgd = million gallons per day

[a] 9.6 mgd is the rated capacity of the desalination plant CalAm proposes to build for the MPWSP, and is typically used to characterize the size of the plant; operating at full capacity a 9.6 mgd plant would produce 10,750 acre feet of desalinated water per year. (That is, the conversion factor is 893 gallons per day per acre-foot per year, or about 1,120 acre-feet per year per 1 million gallons per day.)
[b] 6.4 mgd is the rated capacity of the desalination plant CalAm proposes to build if the GWR project is successfully implemented. The 6.4 mgd rated capacity is typically used to characterize the size of the smaller plant proposed in conjunction with the GWR water purchase. Operating at full capacity a 6.4 mgd plant would produce 7,167 acre feet per year.
[c] CalAm's recognized right to Carmel River water established in Order 95-10.
[d] CalAm's adjudicated water right in the Seaside Groundwater Basin is 1,474 afy; in-lieu recharge of 700 afy would occur during 25-year Seaside Groundwater Basin replenishment period.
[e] Assumed average annual yield with completion of Phase II of the ASR; Phase I of the ASR is currently in operation, and Phase II is nearing completion.
[f] Quantity shown is CalAm's long-term share of plant production pursuant to agreements between CalAm and the city of Sand City.
[g] The Final EIR for the GWR project was certified and the GWR project approved by the Monterey Regional Water Pollution Control Agency, the lead agency, in October 2015.
[h] Assumes 9.6 mgd and 6.4 mgd desalination plants operating at full capacity.

SOURCE: CalAm, 2016b; Svindland, 2016.

2.4.1 Carmel River System

As described above in Section 2.2.3, State Water Board Order 95-10 established that CalAm has a legal right to divert a total of 3,376 afy from the Carmel River system, including surface water diversions from the Carmel River and water pumped from the Carmel Valley Alluvial Aquifer.

2.4.2 Seaside Groundwater Basin Supplies

As described in Section 2.2.2.2, CalAm's adjudicated right to Seaside Groundwater Basin groundwater at the natural safe yield of the basin is 1,474 afy. CalAm and the Seaside Groundwater Basin Watermaster have agreed to a 25-year replenishment schedule for CalAm to pay back the volume of groundwater CalAm has withdrawn in excess of its adjudicated right. CalAm will start to pay back the basin once it has new water supplies. While repayment could occur as either in-lieu or artificial replenishment, CalAm's supply assumption for the sizing of its MPWSP Desalination Plant is that repayment over the 25-year period will occur as in-lieu replenishment at the rate of 700 afy, based on a 5-year running average. Therefore, supply assumed to be available from the Seaside Basin over this period would be limited to 774 afy, again, based on a 5-year running average.

2.4.3 Aquifer Storage and Recovery

The MPWMD and CalAm have implemented Phase I and Phase II of the Seaside Groundwater Basin Aquifer Storage and Recovery (ASR) project. The ASR project entails diverting and conveying Carmel River water during periods of high flow that occur between December and May of each year to the Seaside Groundwater Basin, where it is injected into the aquifer for storage and subsequently recovered for delivery to customers. The Phase I project, which was completed in 2007, includes two ASR injection/extraction wells (the ASR-1 and ASR-2 Wells, also known as Santa Margarita Wells #1 and #2) and a chemical/electrical building that includes a disinfection system for treating extracted water. The ASR-1 and ASR-2 wells are located at the former Fort Ord military base, on the east side of General Jim Moore Boulevard near Eucalyptus Road. ASR water supplies that are extracted from the Seaside Groundwater Basin are disinfected onsite before being conveyed via an existing 16-inch diameter pipeline beneath General Jim More Boulevard to the CalAm distribution system (MPWMD, 2005). In water year 2011, which was wetter than average, 1,117 af of Carmel River water was injected into the groundwater basin. In water year 2012, 132 af was injected; in 2013, 295 af was injected, in 2014, no Carmel River water was injected, and in 2015, 215 af was injected. The estimated average annual yield from the Phase I injection/extraction wells is 920 afy.

The Phase II ASR project has been built and will start running when treatment facilities are completed at the Phase I site. Phase II includes two additional injection/extraction wells (ASR-3 and ASR-4 Wells) at Seaside Middle School, located on the west side of General Jim Moore Boulevard. Together, the ASR-3 and ASR-4 Wells provide the capacity to yield an additional 1,000 afy from the ASR system, resulting in a total capacity of 1,920 afy for Phases I and II combined (Denise Duffy & Associates, 2012). The Phase I and Phase II ASR projects correspond to MPWMD and CalAm's existing State Water Board Permits 20808A and 20808C, which authorize the diversion of up to 2,426 afy for ASR Phase I, and up to 2,900 afy for ASR Phase II (State Water Board, 2007, 2011). Permit conditions establish limits on diversions to the ASR system, including a requirement that minimum mean daily instream flows in the Carmel River be maintained for the protection of fisheries, wildlife, and other instream uses. Because diversions for the ASR system are contingent on maintaining minimum daily instream flows, and precipitation and streamflow can vary substantially from year to year, for the purposes of

CalAm's water supply assumptions, the estimated combined long-term average annual yield from ASR is 1,300 afy for the Phase I and Phase II projects (RBF, 2013). In addition to the injection/extraction wells and treatment facilities, the Phase I and Phase II ASR facilities include two pump stations, a backflush percolation basin,[26] and conveyance pipelines.

As part of the MPWSP, CalAm proposes two additional injection/extraction wells, ASR-5 and ASR-6 Wells. The purpose of the proposed ASR-5 and ASR-6 Wells is to increase the injection/extraction capacity for both desalinated product water and Carmel River supplies and to improve system reliability. The proposed ASR-5 and ASR-6 Wells would not increase CalAm's yield from injected Carmel River supplies; consequently, the average annual yield from Carmel River supplies that are diverted to underground storage would remain at 1,300 afy. The proposed MPWSP ASR facilities are described in Chapter 3, Description of the Proposed Project, and evaluated throughout this EIR/EIS.

2.4.4 Sand City Coastal Desalination Plant

The Sand City Coastal Desalination Plant, which began operations in April 2010, is owned by the City of Sand City and operated by CalAm. The plant's total capacity is 300 afy, of which CalAm's long-term share is 94 afy. The balance of the plant's capacity is reserved by Sand City to support its future growth. Sand City is served by CalAm's distribution system, consistent with the MPWMD's allocation program.

2.4.5 Groundwater Replenishment Project

As described in more detail in Chapter 5, Alternatives, CalAm's MPWSP Application includes a variant of the MPWSP that would combine a reduced-capacity desalination plant (6.4 mgd compared to 9.6 mgd under the MPWSP) with the purchase of 3,500 afy of product water from the GWR project, a joint project proposed by Monterey Regional Water Pollution Control Agency (MRWPCA) and MPWMD. The MRWPCA would inject up to 3,500 afy of purified water from a new advanced water treatment plant into the Seaside Groundwater Basin. Under a purchase agreement with the MPWMD, CalAm would later extract the 3,500 afy for delivery to customers.

If CalAm is able to purchase water from the GWR project, the size of its MPWSP Desalination Plant could be reduced. MRWPCA certified the Final EIR for the GWR and approved the project in October 2015. Because of uncertainties pertaining to project timing and cost at the time CalAm submitted its application for the MPWSP, CalAm's project application proposes a 9.6 mgd plant, but also seeks authorization to reduce the size of the proposed plant to provide 6.4 mgd, and to enter into a water purchase agreement if the cost of the GWR water is reasonable. CalAm would then supplement its supplies with water purchased from the GWR project.

[26] The backwash percolation basin receives discharges produced during routine backflushing and operation of the ASR injection/extraction wells.

On September 15, 2016, the CPUC issued a Decision (D. 16-09-021) authorizing CalAm to enter into a Water Purchase Agreement with the MRWPCA and the MPWMD for the purchase of 3,500 afy. The CPUC Decision also authorizes CalAm to build the new Monterey Pipeline and Monterey Pump Station (CPUC, 2016).[27]

2.4.6 Other supplies

2.4.6.1 Table 13 Water

In 1993, CalAm applied to the State Water Board (Application No. 30215A) for a permit authorizing CalAm to divert from the Carmel River water above its existing rights under Order 95-10 and the ASR permits. This additional water is known as Table 13 water. In October 2013, the State Water Board issued water-right Permit 21330 in response to this application. The permit conveys to CalAm the right to divert a maximum of 1,488 af annually from December 1 of each year to May 31 of the succeeding year, subject to prior rights, the adequacy of daily instream flow, and other provisions and requirements.

In MPWSP testimony submitted to the CPUC in February 2013, before the Table 13 permit was issued, CalAm stated that the Table 13 water would be subject to flow criteria similar to criteria that applied to water diversions for the ASR, and that the Table 13 diversions would, therefore, be constrained by the limited timeframe in which they could occur and by the existing production capacity of the wells and treatment plant on the Carmel River. CalAm also noted that, unlike the ASR diversions, Table 13 water could only be used within the Carmel River watershed. Based on its analysis of customer water use in the watershed at times of year when Table 13 water would be available, CalAm estimated that, during wet years, a maximum of 600 afy of Table 13 water could be used. Because Table 13 water would not be available during dry years, CalAm did not assume the availability of Table 13 water for purposes of sizing the proposed plant (Svindland, 2013c). CalAm reiterated this perspective in testimony provided in 2016.

According to quarterly reports posted at CalAm's website under the State Water Board's Cease and Desist Order, CalAm began reporting diversions of Table 13 water with its reporting of monthly water diverted to ASR storage under Permits 20808A and 20808C in October 2015 (reported in Table 2 of the quarterly reports). According to the October 2015 report, CalAm diverted 42.2 af of Table 13 water for use in water year 2015 and diverted a total of 214.7 af to its four ASR injection wells in Seaside under its ASR permits 20808A and 20808C (CalAm, 2015). According to its April 2016 quarterly report, CalAm diverted 164.2 af of Table 13 water in the first half of water year 2016 (through March 2016), and diverted 647 af of water to storage under its ASR permits (CalAm, 2016c).

[27] On October 30, 2017, the Board of Directors of the MRWPCA adopted an Addendum to the GWR Final EIR to allow for an increase in the peak output of purified recycled water from 4 mgd to 5 mgd. This expansion of the GWR Project would be achieved by utilizing redundancies built into the approved 4 mgd GWR Project and would enable the delivery of 600 afy of purified recycled water to Marina Coast Water District (MCWD) for MCWD customers to use for urban landscape irrigation. The expansion, however, would not result in any potential additional yield for use by CalAm, and it would not impact CalAm's purchase price for water.

2.4.6.2 Malpaso Water Company LLC

In 2015, the State Water Board issued Water Right License 13868A (License 13868A) to Malpaso Water Company, LLC. License 13868A authorizes Malpaso to divert up to 85.6 afy from the Carmel River and to have this water conveyed by CalAm through its water distribution system to property owners that have entered into subscription agreements with Malpaso, for beneficial uses on their properties.[28] License 13868A authorizes use of the diverted water in CalAm's service area in the Carmel River watershed or in the City of Carmel-by-the-Sea. In its decision issuing License 13868A, the State Water Board determined that diversions of water from the Carmel River under the new license for the benefit of Malpaso Water Company Water Use Permit subscribers (Malpaso subscribers) would not be classified as water diverted by CalAm for new service connections or for increased use of water at existing service connections that are prohibited under terms of the CDO.

Malpaso has since contracted with CalAm for the conveyance of water diverted under License 13868A to Malpaso subscribers through CalAm's distribution system, and for the temporary use of the portions of License 13868A that are not used each year by Malpaso subscribers to supply water to CalAm.[29] Excess water not used by Malpaso and diverted for CalAm's use pursuant to this agreement offsets CalAm's Carmel River diversions (CalAm, 2017).

In August 2015, MPWMD adopted Ordinance 165, which gives Malpaso a water entitlement of 80 afy through the CalAm distribution system. The size of the entitlement reflects anticipated production and conveyance losses compared to 85.6 afy diversion permitted by License 13868A. MPWMD will only issue a water permit to a property owner after the person has purchased the water and received plan approval (Locke, 2016).

License 13868A thus increases supplies available to the CalAm Service area from 16,294 afy to 16,380 afy (during the Seaside Basin replenishment period, assuming a 9.6 mgd desalination plant, and from 16,994 afy to 17,090 afy after the replenishment period).

2.4.6.3 Rancho Canada Golf Course Retirement

In April 2016, a coalition of conservation organizations[30] announced plans to acquire 140 acres of the Rancho Canada Golf Club, whose lease expired in April 2017. Under the plan, a large portion of the land, which is located along the Carmel River near Palo Corona Regional Park, would ultimately be turned over to the Monterey Peninsula Regional Park District. The Trust for Public Land would acquire and hold the property until summer of 2017, while raising funds that would enable the Trust to convey the property to the park district. The parties expect to finance the deal through a variety of sources, including state grants, private donations, and support from CalAm (Monterey County Herald, 2016). As part of the plan, CalAm and the Trust executed a water diversion forbearance agreement in April 2016 to reduce pumping from the Carmel River and retire irrigation of two golf courses at the golf club. That irrigation now uses about 381 afy of

[28] MPWMD Ordinance 165.
[29] MPWMD Ordinance 165.
[30] The organizations include the Trust for Public Land, the Monterey Peninsula Regional Park District, the Santa Lucia Conservancy, and Trout Unlimited.

Carmel River water. CalAm has agreed to pay the Trust for its forbearance of diversion during the CDO extension period, which will help CalAm offset its unauthorized diversions and help the Trust acquire the property. Because the acquisition plan anticipates converting much of the acquired land to riparian habitat, a substantial portion of water previously used to irrigate the golf courses should remain in the river permanently (CalAm et al., 2016a).

Because the forbearance agreement between CalAm and the Trust is temporary, and future water use at the site is uncertain, this analysis does not assume that this project would necessarily make the offset supply, formerly used for irrigation, available for other future use.

2.5 Other Supply and Demand Considerations

To meet projected system demand along with the other supply sources discussed above, CalAm proposes to build a 9.6 mgd desalination plant. The plant would include six 1.6 mgd reverse osmosis modules and one 1.6 mgd standby module. As noted above in Section 2.3.2, water demand fluctuates over the day, season, and year. Similarly, the availability of some water supplies that would be used along with the proposed desalination plant also varies over the course of the year. For example, while CalAm has a right to an annual quantity of Carmel River water, the river produces more water in the winter and less in the summer. So to provide adequate service, any water system must be sized to ensure it can meet anticipated peak demands, and it is standard engineering practice to do so. Therefore, anticipated monthly operations were analyzed as part of the development of the proposed project (RBF Consulting, 2013). In addition to CalAm service area water demand, plant operations include CalAm's SVGB return water obligation: the volume of water that would be returned to the SVGB based on the percentage of SVGB groundwater that was produced as source water by the subsurface slant wells. SVGB return water is discussed below in Section 2.5.1 and in Section 2.6, Water Rights.

This section also describes other factors that could affect future water demand and supplies in CalAm's Monterey District.

2.5.1 Salinas Valley Groundwater Basin Return Water

MPWSP source water would include some brackish groundwater from the SVGB. As part of the proposed project, CalAm would return to the SVGB a volume of desalinated product water equal to the amount of SVGB groundwater included in the source water. While CalAm's SVGB return water obligation will be based on the amount of fresh water in the source water, in order to consider the effect of the return water for this EIR/EIS, groundwater modeling simulated scenarios with return water obligations representing 0, 3, 6, and 12 percent of the source water (see Section 4.4, Groundwater Resources). The amount of SVGB groundwater included in the source water is expected to decrease over time (CalAm et al., 2016b).

In June 2016, several parties involved in the current proceeding asked the CPUC to approve their proposed "Settlement Agreement on MPWSP Desalination Plant Return Water" (CalAm et al., 2016b). The settlement describes how CalAm would fulfill its annual SVGB return water obligation. As the settlement explains:

- Delivering return water by injecting desalinated water from the proposed project into the SVGB is considered less desirable than delivering return water for beneficial use in the SVGB.
- The Castroville Seawater Intrusion Project (CSIP) may not have sufficient capacity to accommodate all of the MPWSP SVGB return water under some conditions.
- The Castroville Community Services District (CCSD), which provides municipal and domestic water service to the Town of Castroville, currently relies on about 780 afy of SVGB groundwater to meet Castroville's water demands, and increasingly has experienced water supply challenges because the water is getting saltier.
- The CCSD wants to take delivery of a SVGB return water supply to replace all or part of CCSD's current reliance on groundwater from the SVGB.

To fulfill its SVGB return water obligation, CalAm would make return water available for other water suppliers to use instead of pumping groundwater from the SVGB. The return water settlement requires CalAm either to make 800 afy of return water available for delivery to CCSD, assuming they build the 9.6 mgd plant, or to make 690 afy available if they build the 6.4 mgd plant. CCSD's avoided cost – that is, what they would have had to pay to produce enough groundwater to meet demand – will determine the price that CCSD would pay for the return water. If there is any return water left after CCSD takes its share, CalAm would deliver it to the CSIP. The pipeline that would need to be built to convey return water to Castroville is described in Chapter 3, Description of the Proposed Project, and its potential impacts are evaluated in subsequent chapters of this EIR/EIS. See Section 2.6, below, for more on this topic.

2.5.2 Potential Future Changes in Supply

2.5.2.1 Los Padres Reservoir

State Water Board Order 95-10 reduced CalAm's right to divert surface water to storage at Los Padres Reservoir from 3,030 afy to 2,179 afy, because the legal right to divert water to storage is limited by the physical ability to store the water. In a 2006 study, the MPWMD noted that the State Water Board could revisit Order 95-10 and, by applying the same logic, further reduce CalAm's right to divert water to storage based on additional losses in reservoir capacity due to ongoing sedimentation (MPWMD, 2006a). A 2008 bathymetric study by the Watershed Institute at California State University at Monterey Bay determined that the usable storage capacity of the reservoir in 2008 was 1,669 af. Based on the 2008 study, MPWMD estimated that the long-term sedimentation rate of the reservoir was 21 afy and that more than 510 af of replacement supply would likely be needed to offset the lost capacity (MPWMD, 2015b). A 2016 resurvey conducted for MPWMD determined that although the reservoir can hold up to 1,810 af at the spillway level, the safe usable storage was less than 1,400 af due to concerns about releasing anoxic water or water with hydrogen sulfide in the lowest portion of the reservoir (MPWMD, 2017). MPWMD currently estimates that sedimentations rates could range from 11 to 19 afy. Based on the 2016 resurvey and changes in reservoir operation, MPWMD currently believes that the previous estimate of needed replacement supply may be low. However, because the need for this replacement supply is long-term, MPWMD believes that water supply available from the Seaside

Groundwater Basin at the end of CalAm's in-lieu replenishment period (discussed in Section 2.2.4) may be adequate to offset losses in supply from the Los Padres Dam and Reservoir (MPWMD, 2017).[31] As noted in Section 2.2.2, MPWMD and CalAm are currently studying the long term options for the Los Padres Dam and Reservoir.

2.5.2.2 Conclusion of Seaside Groundwater Basin Replenishment Period

As discussed in Section 2.2.4, the proposed project assumes the availability of 747 afy of water supply from the Seaside Groundwater Basin. At the conclusion of the 25-year replenishment period, CalAm would have access to its total adjudicated right of 1,474 afy, thus augmenting available supply by 700 afy.

2.5.3 Potential Future Changes in Demand

Several recent and planned projects and actions could serve to reduce or offset demand assumed by CalAm during the planning and sizing of the proposed MPWSP Desalination Plant. Conversely, growth within the Monterey District service area that is consistent with adopted general plans could increase demand beyond that assumed for the proposed project. This section describes other projects and actions that were not explicitly accounted for in CalAm's demand estimates but that could affect future service area demand.

As the price of water changes, customers' behavior may change as well. When water is less expensive, people typically use more of it; when water is more expensive, people typically conserve more. But no one knows how much water will cost in the future, or how the CPUC will structure CalAm's water rates. Also, people in CalAm's Monterey District have a long history of water conservation, and already use very little water compared to the rest of the state. But if the MPWSP comes on line, that would make CalAm's water supply more reliable, and would probably lift the constraints imposed by Order 95-10 and the CDO, which might induce people to use more water, even if that water is also becoming more expensive. Given the number of variables involved, speculating about what effect future water prices might have on behavior is futile.

2.5.3.1 Pacific Grove Local Water Project

The City of Pacific Grove wants to create a new supply of non-potable water. In the first phase of the Pacific Grove Local Water Project, the city will build and operate a 0.25 mgd satellite recycled water treatment plant that would provide up to 125 afy of recycled water primarily to the Pacific Grove Municipal Golf Links and the El Carmelo Cemetery.[32] The recycled water would replace potable supply currently used for these facilities. Pacific Grove certified an EIR on the project in November 2014. In October 2015, the city certified a supplemental EIR on a modified project, and

[31] The estimate of safe useable reservoir capacity based on the 2016 resurvey is 779 af less than the capacity identified in Order 95-10 (2,179 af), and an additional 700 afy will be available to CalAm at the end of the Seaside Groundwater Basin in-lieu replenishment period.

[32] Subsequent phases of the PGLWP could provide up to 600 afy of recycled water to sites within the cities of Pacific Grove and Monterey and unincorporated areas of Pebble Beach (City of Pacific Grove, 2014).

approved the project as modified. The modified project includes a water entitlement for the city from MPWMD for up to 90 afy of the potable water saved by the PGLWP, to be used to serve a portion of Pacific Grove's anticipated buildout water demand (City of Pacific Grove, 2015).

The State Water Board approved Clean Water State Revolving Fund financing for the project in November 2015. The approval includes a condition that prohibits the allocation of potable water saved by the project for new uses until the State Water Board gives consent to use the water for new connections. In January 2016, MPWMD adopted Ordinance No. 168, which establishes an entitlement for Pacific Grove of 66 afy for consumption from CalAm's distribution system; permanently suspends from use 13 afy, for the benefit of the Carmel River system; and reserves 9 afy for the MPWMD for its exclusive use for allocation to other jurisdictions. MPWMD established the entitlement so that it would be available to Pacific Grove when the State Water Board authorizes use of the saved water for new connections (MPWMD, 2016c; State Water Board 2015). The project is expected to be operational and delivering up to 125 afy by the end of 2017 (MPWMD, 2016c; 2017). Although the MPWMD has issued the City of Pacific Grove a permit to receive potable supply from CalAm's system, when available, and MPWMD has reserved for itself, for future allocation, an entitlement for a portion of the saved water, the combined permits for Pacific Grove and MPWMD associated with this project are less than the amount of potable water currently used for irrigation that the project would offset. So the project should reduce demand when it is operational.

In 2013, CalAm and several other parties asked the CPUC to approve a settlement agreement on plant sizing and operations. The Settling Parties agreed that the Pacific Grove project would be a valuable part of a comprehensive solution to water issues in CalAm's Monterey District when integrated with the MPWSP, the GWR Project, and ASR (CalAm et al., 2013a).

2.5.3.2 Pebble Beach Recycled Water Project Phase II

The Carmel Area Wastewater District-Pebble Beach Community Services District reclamation project provides recycled water to irrigate Del Monte Forest golf courses and other open space areas. Phase I of the project, completed in 1994, offset demand for about 70 percent, or 700 af, of the potable water previously used for this purpose (Sweigert, 2008). Phase II of the project, which was completed in 2009, eliminated the need to mix any potable water with the recycled water; the project now supplies 100 percent of the water used at the area golf courses and is estimated to save approximately 1,000 afy of potable water (Stoldt, 2011). In planning for the MPWSP, CalAm based its current estimate of service area demand on the 10-year average of years 2006 through 2015. Assuming Phase II of the reclamation project became operational midway through 2009, the additional 300 afy demand reduction it achieved would be reflected in demand data for more than half that baseline period; therefore, although additional reductions in service area demand may occur as a result of this project it is expected such reductions would be minor.

2.5.3.3 Non-revenue Water Reduction

The Final EIR for the Coastal Water Project and the Regional Project[33] noted that improvements in CalAm's distribution system could reduce demand by reducing non-revenue water. Non-revenue water, also known as unaccounted-for water, is the difference between a water system's metered production and metered consumption.

In its 2009 CDO, the State Water Board observed that the industry standard for non-revenue water was 10 percent; that CalAm's non-revenue water was about 12 percent of production; and that the MPWMD had required CalAm to reduce non-revenue water to 7 percent (State Water Board, 2009). The State Water Board concluded that CalAm should be required to reduce its system losses by about 549 afy and should immediately start to reduce the losses. Similarly, in 2009, the CPUC addressed CalAm's acute need to reduce non-revenue water in the Monterey District. The CPUC ordered CalAm to develop and implement a program for reducing unaccounted-for water in its Monterey main system and associated subsystems and, to provide a financial incentive, the CPUC created a penalty/reward program to be calculated based on a 9 percent non-revenue water target (CPUC, 2012). A June 2012 CPUC rate case decision (D.12-06-016) also found that non-revenue water in the Monterey District needed to be reduced.

CalAm has often described the company's efforts to reduce non-revenue water in its Monterey District (Sabolsice, 2012; CalAm et al., 2016a). These efforts include:

- investigating and analyzing main breaks and service leak data and evaluating pressure-control methodologies
- replacing older water mains and service lines in areas shown to be more prone to leaks
- replacing meters
- deploying acoustic leak-detection devices throughout the system
- implementing operational fixes such as pressure reduction

CalAm submits quarterly compliance reports to the State Water Board under the CDO (CalAm, 2011, 2012b, 2013, 2014, 2015). Those reports show that between the 2011 and 2015 water years, CalAm reduced system losses by an average of 506 afy compared to the base year system losses in water year 2009, and that by the end of this period the reductions in water losses exceeded the reduction target of 549 afy that had been established in the 2009 CDO: the reduction in system losses ranged from 752 af in water year 2013 to 919 af in water year 2015. System losses (i.e., the amount of non-revenue or unaccounted-for water), as opposed to the *reduction* in losses, for the period October 2014 through September 2015 (water year 2015) totaled to 357 af and system losses for the period January through December 2015 (calendar year 2015) totaled to 247 af (CalAm, 2016d). Since then, through March 2017, system losses were less than 200 afy in all

[33] As described in Chapter 1 (Section 1.4), CalAm previously proposed the Coastal Water Project to replace existing Carmel River supplies to which CalAm no longer has a recognized legal right pursuant to Order 95-10 (discussed in Section 2.2.3 above). The Regional Project emerged as an alternative to the Coastal Water Project during the environmental evaluation of the Coastal Water Project. The CPUC certified the EIR in 2009 and approved the Regional Project, which would have been jointly implemented, in two phases, by CalAm and the Marina Coast Water District, in 2010. CalAm eventually withdrew its support for the Regional Project due to the inability to resolve issues that arose related to its implementation, and in 2012 proposed the MPWSP as an alternative.

12-month periods except one (April 2016 to March 2017), when non-revenue water totaled 271 af. CalAm notes that the actual components of unaccounted-for water are difficult to identify because unaccounted-for water represents a combination of system leaks and unmetered water use. Savings from system repairs and line replacements and the like through 2015 are reflected in CalAm's system demands data discussed in Section 2.3.1.

CalAm's program to address system losses will continue under the CDO and the CPUC's decisions. While additional reductions in demand can be expected from continuing efforts to address system losses, data are not available to quantify potential additional future savings from such efforts. Over time, the size of additional reductions in system losses will inevitably decrease as CalAm replaces the oldest and most leak-prone lines and implements other efforts to reduce losses.

2.5.3.4 General Plan Buildout

CalAm is not proposing that the MPWSP meet future demands associated with general plan buildout, although the proposed project does include water for some future development (e.g., development of vacant lots of record). Phase 2 of the Regional Project[34] included water to meet projected future service area demands; the MPWMD prepared that estimate of future water needs in 2006 based on information obtained from the service area jurisdictions (MPWMD, 2006b). Each jurisdiction provided estimates of the number of residential units and nonresidential square footage that would be developed under buildout of the currently adopted general plan as well as anticipated residential remodels. Because not all jurisdiction submitted estimates for lots of record as a distinct category, that aspect of general plan buildout in the 2006 estimate does not compare to CalAm's current estimate for lots of record. The MPWMD estimated that 4,545 afy would be needed to meet future water demands (MPWMD, 2006b).

Since the 2006 estimate was prepared, the future water needs of four jurisdictions have been revised, reducing the total:[35]

- Monterey County adopted a new general plan that revised their water demand estimates (Monterey County, 2010);
- The City of Pacific Grove testified on the MPWSP in 2013, revising its estimate of water needed to accommodate general plan buildout (Hardgrave, 2013);
- The City of Seaside commented on the April 2015 MPWSP Draft EIR, updating its future water needs, and noting that full buildout of the West Broadway Urban Village Specific Plan would require a net increase of 80 afy of water (City of Seaside, 2015).

34 Refer to Chapter 1 for more information on the Regional Project.

35 The EIR prepared for the *Monterey County General Plan* provides two estimates of future water demand for the Greater Monterey Peninsula: one for the general plan planning horizon, which extends to 2030, and one for complete buildout under the general plan, which the EIR projected would occur in 2092. The estimate assumed in this analysis (1,005 afy) is for the 2030 planning horizon. Total buildout demand under the general plan is much higher (4,439 afy, not including unincorporated Carmel and Del Monte Forest, for which buildout estimates are not provided). Because the general plan EIR estimate of demand used a substantially higher per-capita water use rate than is currently assumed, and projected a higher population level than is currently assumed by the Association of Monterey Bay Area Governments, there is reason to believe that the 2092 buildout projection overstates both future population and water demand; therefore, the shorter term planning horizon was considered a more reasonable estimate for this analysis.

- Sand City built the 300-afy Sand City Coastal Desalination Plant. In consideration for the delivery of 300 afy of potable water from this plant to the CalAm system, MPWMD Ordinance 132 establishes a water entitlement of 206 afy from the CalAm system for Sand City, separate from the city's current water allocation, and indicates that the remaining 94 afy will be permanently added to CalAm's system (as shown above in Table 2-4). The estimated future demand for Sand City is therefore revised to reflect that 206 afy of the city's future demand will be offset by supply from the city's desalination plant (which is not included in the supplies assumed for the MPWSP in Table 2-4).

With these revisions, future demand would total 3,526 afy. **Table 2-5** shows the MPWMD's 2006 future demand estimates, with and without the four revisions. In addition, Pacific Grove may reduce its future demand estimate by 66 afy because of the Pacific Grove Local Water Project (see Section 2.5.3.1). However, the city has not submitted a formal revision to its demand estimate since the 2013 revision noted above.

TABLE 2-5
FUTURE WATER DEMAND – SERVICE AREA JURISDICTIONS
(acre-feet per year)

Jurisdiction	Future Supply Needs (2006 Estimate)[a]	Future Supply Needs (Revised Estimate)
City of Carmel	288	288[b]
City of Del Rey Oaks	48	48
City of Monterey	705	705
City of Pacific Grove	1,264	500[c,d]
City of Sand City	386	180[e]
City of Seaside	582	662[f]
Monterey County (Unincorporated)	1,135	1,005[b,g,h]
Monterey Peninsula Airport District	138	138
Total	**4,545**	**3,526**

NOTES:

a Based on the MPWMD's "Estimated Long-Term Water Needs by Jurisdiction Based on General Plan Build-out in Acre-Feet," Exhibit 1-C of Special Meeting/Board Workshop Agenda Item 1, MPWMD Board of Directors Packet, May 18, 2006b.

b State Water Board License 13868A, issued in 2015, authorizes Malpaso Water Company to divert 85.6 afy from the Carmel River for delivery to property owners in CalAm's service area in the Carmel River watershed or the City of Carmel-by-the-Sea who have entered into subscription agreements with Malpaso Water Company. Provision of this water supply could therefore reduce system demand in the City of Carmel-by-the-Sea and unincorporated Monterey County by a total of 86.6 afy if the water available from Malpaso Water Company is fully subscribed.

c Revised based on testimony submitted to the CPUC by the City of Pacific Grove revising its 2006 estimate as shown.

d Future supply needs by the City of Pacific Grove may be reduced by an additional 66 afy in recognition of the 66 afy water entitlement established for the city by MPWMD in consideration of its Pacific Grove Local Water Project (see Section 2.5.3.1).

e Sand City's 300 afy desalination plant, which was constructed after preparation of the 2006 estimate of future supply needs, provides Sand City a water entitlement of 206 acre-feet (pursuant to MPMWD Ordinance 132) to meet future demand in the city, thereby offsetting the original demand estimate by 206 afy. (Because this portion of the Sand City plant's production is not included in the supplies assumed by CalAm, shown in Table 2-4, it is also not shown here, in order to avoid double counting demand that will be met by another source.)

f Revised based on the City of Seaside comment on April 2015 Draft EIR and attached water supply assessment indicating that full buildout of the West Broadway Urban Village Specific Plan would require a net increase of 80 afy of water (City of Seaside, 2015; Schaaf & Wheeler, 2008); the specific plan was adopted in 2010.

g Revised based on the Final EIR prepared for the 2010 *Monterey County General Plan*; the estimate shown is for the unincorporated county areas served by the Carmel River and Seaside Basin aquifer in the general plan horizon year (2030), rather than general plan buildout (which is not expected until 2092).

h The estimate provided in the 2010 General Plan Final EIR for the unincorporated county area served by the Carmel River and Seaside Basin aquifer includes 492 acre feet for the Highway 68/Airport affordable housing overlay, as well as supply for Greater Monterey Peninsula area (316 acre feet), the Carmel Mid-Valley affordable housing overlay (75 acre feet), Cachagua (partial) (5 acre feet), Carmel Valley (60 acre feet), unincorporated Carmel (37 acre feet), and Del Monte Forest (20 acre feet).

SOURCES: MPWMD, 2006b; Monterey County, 2010; Hardgrave, 2013, City of Seaside, 2015; Shaaf & Wheeler, 2008.

As discussed in Section 2.3, the proposed MPWSP would provide water supply to meet a projected total service area demand of about 14,275 afy, which is 1,680 afy more than CalAm's estimate of current annual demand (12,270 afy) and existing Pebble Beach water entitlements (325 afy). Part of this 1,680 afy is intended to serve existing service area customers in the hospitality industry under improved economic conditions and part is intended to serve future development of lots of record. Analysis presented in Section 6.3 indicates CalAm might have overestimated the amount needed to serve existing hospitality industry customers under improved economic conditions (500 afy) by about 250 afy and that the other 250 afy designated for hospitality industry recovery may therefore be available to serve future growth. Assuming that revised estimate for the hospitality industry, about 1,430 afy of the 14,275 afy would be available to serve additional development in the CalAm service area. Although the project proposes to meet a narrower range of future development than was assumed for Phase 2 of the Regional Project, the amount of water provided by the proposed project to serve additional development represents about half of the revised estimate of future service area demands. As the revised estimate in Table 2-5 indicates, the proposed project would provide 2,096 afy less than would be needed to meet water demand associated with general plan buildout (3,526 afy) and the other future water demand considered in the 2006 analysis.[36]

The MPWMD, the Monterey Peninsula Regional Water Authority, Monterey County, and CalAm plan to determine an accurate estimate of the added capacity needed to meet the General Plan buildout projections for communities served by CalAm. The findings from this process, which will be undertaken separately from the current A. 12-04-019 proceeding, will be reported to the CPUC either within a subsequent rate design phase of A. 12-04-019 or as part of the general rate case process (CalAm et al., 2013b).

2.5.4 Assumptions about the Allocation of MPWSP Water

As discussed in Section 2.3, CalAm proposes to size the MPWSP Desalination Plant to provide, along with other sources, sufficient supply to meet service area demand of 14,275 afy. This amount is 1,680 afy more than the 12,270 afy annual demand of existing customers and existing Pebble Beach water entitlements (325 afy) (shown in Table 2-3), and without Seaside Basin replenishment, it would be 2,380 afy more than existing annual demand and entitlements. In addition to meeting existing service area demands, CalAm proposes sizing the plant to meet demand associated with the development of vacant legal lots of record and, if the economy improves, demand from increased water use at existing hospitality businesses. While such increases in water demand can reasonably be expected, estimating future water demand necessarily entails the use of assumptions about demand factors that cannot be predicted with absolute certainty. (As discussed in Section 2.3.3,

[36] The estimated difference could be less considering ongoing conservation programs that MPWMD and CalAm have been implementing in response to SWRCB Order 95-10 (in 1995) and the more recent CDOs. The California Water Conservation Act of 2009 (adopted after the general plan estimates were prepared in 2006) requires a 20 percent reduction in per capita water use statewide by the year 2020 (Water Code Section 10608). Assuming the conservation programs implemented in CalAm's Monterey District – in response to SWRCB orders as well as this 2009 law – reduced water use and projected demand by 20 percent, the corresponding future general plan buildout demand would be about 2,870 afy, and the difference between the MPWSP supply and this future demand would be about 1,400 afy. MPWMD states that the appropriate estimate of future water needs is 3,526 afy (shown in Table 2-5), not further reduced by 20 percent, because MPWMD's 2006 estimate assumed efficient plumbing fixtures that meet or exceed the requirements of Water Code Section 10608 (MPWMD, 2017).

MPWMD's review of the factors included in CalAm's estimate produced somewhat different results. For example, MPWMD's review indicated that supply needed for future development of vacant lots of record may be underestimated and the supply needed for economic recovery of the hospitality industry may be overestimated.) Moreover, under past and current allocation programs, once a given supply has been allocated to a jurisdiction, whether or not the jurisdiction reserves its allocation for specific uses and at specific levels that CalAm assumed for project sizing would be up to the jurisdiction. It is the jurisdiction's responsibility to determine, subject to applicable plans, policies, laws, and regulations, whether or not to approve a new or intensified water use within its boundaries. In addition, with other supply sources the MPWSP would provide total supply of 16,294 afy during the Seaside Basin replenishment and 16,994 afy after the replenishment period, as shown in Table 2-4. Available supply after 14,275 afy of anticipated demand was met may need to be returned to the Salinas Valley Groundwater Basin, or may be available for growth within service area jurisdictions, depending on the return water obligation.

One of the MPWMD's key functions is to allocate water supply within its boundaries. The water supply that the proposed project would provide, along with other existing and planned supplies, would continue to be subject to MPWMD's allocation program. Although MPWMD has not yet begun to address allocation of the proposed MPWSP supply, this analysis assumes that the same considerations that informed the past and current allocations will be relevant to the allocation of the MPWSP supply. This EIR/EIS assumes for purposes of the impact analyses presented in Chapters 4 through 6 that water provided by the proposed project will be used to meet existing demand and that any water left over would be allocated in general proportion to projected growth in the CalAm service area jurisdictions. MPWMD recently confirmed that the future allocation process has not been defined and that MPWMD will update its 1990 Allocation Program EIR only when it is clear that CalAm will complete construction of a project to provide replacement supplies [for the reductions that resulted from SWRCB Order 95-10 and related CDOs and the Seaside Basin adjudication] (MPWMD, 2017). MPWMD states that it may not allocate all the water, choosing instead to retain some for future allocation to jurisdictions, "as general plans change over time," or to "retain a reserve for public benefit projects, maintain a reserve to offset Pebble Beach entitlements, maintain a buffer for fluctuating demand due to economic or climate issues, or retain allocable water to allow a lower plant capacity factor for operations" (MPWMD, 2017). In the absence of definitive commitments as to how water provided by the project would be allocated (or not), the assumption that water provided by the project not needed for existing demands or Salinas Valley return water would be used to meet demand associated with future growth, distributed in general proportion to projected planned growth in the CalAm service area, is a reasonable and appropriately conservative assumption for the impact analysis.

2.6 Water Rights

The topic of water rights is not one typically addressed in an EIR/EIS. It is a state legal matter that is rarely relevant to the question of whether a proposed project being evaluated under CEQA or NEPA will generate impacts on the environment. Additionally, consideration of these issues is not required for MBNMS's permit/authorization process and the federal government takes no opinion on these matters of state law. Here, however, the issue of water rights is addressed as one of project feasibility. The proposed project (MPSWP) and Alternative 5a are designed to take supply water via underground slant wells that would draw water from aquifers that extend underneath Monterey Bay, and at this location, would eventually be recharged primarily by seawater. The wells would be located at the western edge of the Salinas Valley Groundwater Basin (SVGB, or the "Basin"), a large basin that extends approximately 100 miles between Monterey Bay (in the northwest) to the Salinas River headwaters (in the southeast). Details concerning the Basin conditions and stratigraphy (geologic conditions) are set forth in Section 4.4, Groundwater Resources, of this EIR/EIS. Particularly because the project supply wells could draw some source water from the landward area of the Basin, concerns have been expressed as to whether CalAm does or will hold legal rights to use the water that would be taken by the slant wells, treated at the desalination plant and supplied to CalAm customers located outside the Basin.

The CPUC is not the arbiter of whether CalAm possesses water rights for the project and nothing in this EIR/EIS should be construed as the CPUC's opinion regarding such rights, except to the extent that the CPUC must determine whether there is a sufficient degree of likelihood that CalAm will possess legal rights to pump and desalinate the source water that would supply the desalination plant such that the proposed project can be deemed to be feasible. Indeed, no government agency will formally grant water rights to CalAm for the proposed project. In California, groundwater rights are established by diversion/pumping and use, and groundwater – other than subterranean streams and underflow of surface water – is regulated through common law (court cases) rather than through the issuance of permits by government bodies. The SVGB is not an adjudicated groundwater basin, so use of the groundwater in the Basin is not subject to existing court decree, written agreements or oversight by an impartial watermaster.[37] There are three relevant types of groundwater rights: (1) overlying rights whereby those who own land atop the Basin may make reasonable use of groundwater on such overlying land; (2) prescriptive rights whereby a water user has acquired another's rights to use water via an open, adverse and sustained use under a claim of right that such user would otherwise not be entitled to; and (3) appropriative rights whereby the groundwater may be used outside the Basin or for municipal purposes. While CalAm owns 46 acres of land (the proposed desalination plant location) overlying the Basin, that land would not support sufficient water for the project and would not entitle CalAm to use the water beyond the property that it owns. CalAm has no prescriptive groundwater rights in the Basin. Thus, CalAm would take any Basin water for the project via appropriative rights. Appropriative groundwater rights are developed subject to, and are thus junior to, existing appropriations and use by overlying users. If the proposed project is approved and any dispute arises as to whether or not CalAm possesses legal water rights, such dispute likely would be resolved through court action. Naturally, however, if CalAm does not have the right to the supply water for the proposed project, the proposed project could not proceed and would thus prove infeasible. This section examines whether, based upon the evidence currently available, the CPUC could conclude that there is a sufficient degree of likelihood that CalAm will possess rights to the water that would supply the desalination plant such that the proposed project can be deemed to be feasible.

[37] An adjudicated groundwater basin is one in which a court has determined the amount of groundwater that each party may extract per year, often based upon studies of the basin and a determination of the safe yield of the basin to sustain it in the long-term. Adjudicated groundwater basins have court-appointed watermasters, who oversee basin operations. The Seaside Basin is an example of an adjudicated groundwater basin.

Numerous court decisions have enunciated that an EIR prepared under CEQA for a large scale land use development project must analyze the reasonably foreseeable impacts of supplying water to the project.[38] Such an EIR should show a reasonable likelihood that water will be available from an identified source and must evaluate environmental impacts from likely future water sources to serve the proposed project. Those cases arise in a different context than the MPWSP. Those cases are concerned with whether there will be enough water to support construction of land use projects and to supply the operational needs of the project occupants for drinking, cooking, bathing, waste water, industrial processes, irrigation, etc. Quite conversely, the MPWSP is itself a water supply project, aimed primarily at creating the water supply to replace current water supplies to which CalAm is not legally entitled. From a physical perspective, it is more than reasonably foreseeable that sufficient water is available to supply feedwater for the MPWSP desalination plant. There is knowledge as to where the water will come from and certainty that a sufficient quantity of water will be available. The physical effects of MPWSP's withdrawal of water are fully analyzed in Section 4.4, Groundwater Resources, of this EIR/EIS.

The primary purpose in requiring an EIR to identify the water supply source for a project and to analyze the effects of supplying water to the project is to ensure that land use development projects that will use water are not built without consideration of water supply. Unlike with land use development projects, here, if CalAm did not possess legal rights to use the feedwater for the MPWSP desalination plant, then the desalination plant simply could not operate and the project would not go forward. That is why water rights factors in as a key project feasibility issue.

2.6.1 State Water Resources Control Board Report

Questions have been posed in the CPUC's proceeding as to whether CalAm could demonstrate water rights to the MPWSP supply water. Furthermore, as noted above, CalAm's right to the project feedwater is a basic feasibility issue for the project. The SWRCB is the state agency authorized to exercise advisory, expert, adjudicatory and regulatory functions in the areas of water rights, water quality and safe and reliable drinking water. By letter dated September 26, 2012, the CPUC asked that the SWRCB assist the CPUC and issue an opinion as to whether CalAm has a credible legal claim to the supply water for the MPWSP. The SWRCB carefully considered the then-available facts and evidence concerning the MPWSP, prepared a draft report on water rights, circulated that draft for public comments and ultimately issued its July 31, 2013, Final Review of California American Water Company's Monterey Peninsula Water Supply Project (Report). The Report is attached to this EIR as **Appendix B2**.

First off, the Report confirms that "Cal-Am needs no groundwater right or other water right to extract seawater from Monterey Bay." Report at 33. Thus, CalAm does not need a water right for the vast majority of the MPWSP supply water because most of the supply water for the 9.6 mgd desalination plant with supply wells at the proposed CEMEX location is projected to be seawater[39]

[38] These decisions include *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal. 4th 412, and *Cherry Valley Pass Acres and Neighbors v. City of Beaumont* (2010) 190 Cal.App.4th 316.

[39] The term "seawater" in this EIR/EIS means water that originated in the ocean, identified as containing 33,500 mg/L of TDS, which represents current salinity levels in Monterey Bay.

from the Monterey Bay. No water right need be secured for the seawater element of the MPWSP supply water.

Next, as to water that may be derived from the Basin itself rather than from the ocean, the Report explains (as discussed above) that there are three types of groundwater rights: (1) overlying rights for those who own land above the Basin; (2) prescriptive rights for those who have adversely established a pattern of use of Basin water; and (3) appropriative rights. CalAm would need an appropriative groundwater right to retrieve and export water from the Basin. The Report sets forth the view of the SWRCB as to the set of circumstances under which CalAm would have the requisite appropriative rights to groundwater to support the project. Essentially, if otherwise unusable (i.e., brackish[40] or contaminated) Basin groundwater could be extracted without harm to existing lawful water users and any fresh groundwater[41] extracted is returned to the Basin to avoid injury to existing legal water users, then CalAm would have rights to the portion of feedwater that comes from the Basin because the MPWSP product water that contains such Basin water would be "developed water."

Developed water is water that was not previously available to other legal users and that is added to the supply by the developer through artificial means as a new water source. "The key principle of developed water is if no lawful water user is injured, the effort of an individual to capture water that would otherwise be unused should be legally recognized." Report at 37. Due to long-term seawater intrusion (where the seawater has moved inland) in the Basin, large areas of the Basin groundwater are impaired and unsuitable for drinking and agricultural uses. The geographic areas from which the project supply wells could draw water from inland of the sea are indeed intruded by seawater. (See Section 4.4, Groundwater Resources) "Since this groundwater is reportedly impaired, it is unlikely that this water is, or will be put to beneficial use." Report at 15. In fact, in response to concerns over seawater intrusion and historic overdraft in the Basin, the County adopted Ordinance No. 3709, which precludes the installation of new groundwater wells and prohibits groundwater pumping between mean sea level and 250 feet below mean sea level in certain areas.

The Report concludes that the project's proposed withdrawal of some brackish groundwater for creating developed water is appropriate so long as no injury is incurred by existing legal water users of the Basin. Setting up the test to discern whether CalAm possesses water rights for the proposed project, the Report states:

> [I]n developing a new water source Cal-Am must establish no other legal user of water is injured in the process. Even if Cal-Am pumps water unsuitable to support beneficial uses, the water could not be considered developed water unless users who pump from areas that could be affected by Cal-Am's MPWSP are protected from harm.

40 The term "brackish water" in this EIR/EIS means water that is a combination of seawater and fresh water, and thus contains Total Dissolved Solids (TDS) levels between 500 mg/L and 33,500 mg/L.

41 The term "fresh water" in this EIR/EIS means water that originated in a groundwater basin through precipitation or rivers and streams; in the context of the project, fresh water is water that originated within the SVGB, identified as containing TDS concentrations of less than 500 mg/L, consistent with the secondary drinking water standards established by the SWRCB in Title 22 California Code of Regulations, section 64449, as recommended levels of TDS.

> Cal-Am proposes a replacement program for the MPWSP water that can be attributed to fresh water supplies or sources in the Basin. If Cal-Am can show all users are uninjured because they are made whole by the replacement water supply and method of replacement, export of the desalinated source water would be permissible and qualify as developed water. In the future, this developed water would continue to be available for export even if there are additional users in the Basin. Developed waters are available for use by the party who develops them, subject to the “no injury” standard discussed previously.

Report at 38. The Report specifies three categories of foreseeable injuries that conceivably could be experienced by overlying water users within the area of influence of the MPWSP supply wells: “(1) a reduction in the overall availability of fresh water due to possible incidental extraction by the MWPSP; (2) a reduction in water quality in those wells in a localized area within the capture zone; and, (3) a reduction in groundwater elevations requiring users to expend additional pumping energy to extract water from the Basin.” Report at 45. Each of these possible forms of injury is examined below.

State water policy favors enhancement of beneficial uses of water. Specifically, Article X, section 2 of the California Constitution requires “that the water resources of the State be put to beneficial use to the fullest extent to which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented.” In addition, Water Code sections 12946 and 12947 proclaim it state policy to economically convert saline water to fresh water, stating, “Desalination technology is now feasible to help provide significant new water supplies from seawater, brackish water and reclaimed water.”

In light of these legal requirements, the Report discusses the physical solution doctrine of water rights law, which could come into play if the MPWSP would beneficially develop water, but would in so doing cause injury absent one or more mechanisms to address and ameliorate such injury. In such a circumstance, physical solutions could be employed by CalAm to alleviate the harm effected by the MPWSP and make whole the injured water rights holders. The types of physical solutions would be dictated by the actual harm caused by the MPWSP, but could include such actions as providing replacement water supplies or funding improvements or additional pumping costs needed to ensure that the senior water users in the Basin remain in the same position as they were prior to construction and implementation of the MPWSP. The Report stated that, “Under the physical solution doctrine, although the Basin continues to be in a condition of overdraft, to maximize beneficial use of the state’s waters Cal-Am may be allowed to pump a mixture of seawater, brackish water, and fresh water and export the desalinated water to non-overlying parcels.” Report at 42. As discussed above, the key criteria are that existing water users will not be injured by CalAm’s use of Basin groundwater and that any fresh water component withdrawn by the MPWSP supply wells will be returned to the Basin for beneficial use.

> In summary, to appropriate groundwater from the Basin, the burden is on Cal-Am to show no injury to other users. Key factors will be the following: (1) how much fresh water Cal-Am is extracting as a proportion of the total pumped amount and how much desalinated water is thus available for export as developed water; (2) whether pumping affects the water table level in existing users’ wells and whether Cal-Am can avoid injury that would otherwise result from any lowering of water levels through monetary compensation or paying for upgraded wells; (3) whether pumping affects water quality to users’ wells within the capture zone and whether Cal-Am can avoid or compensate for

> water quality impacts; (4) how Cal-Am should return any fresh water it extracts to the Basin to prevent injury to others; and (5) how groundwater rights might be affected in the future if the proportion of fresh and seawater changes, both in the larger Basin area and the immediate area around Cal-Am's wells.

Report at 46. The Report concluded that further data were needed in order to apply the facts and evidence to the criteria set forth in the Report for determining CalAm's water rights. The Report noted that information was needed pertaining to the depth of the project supply slant wells, the hydrogeologic conditions of the site and the area, updated modeling to evaluate the impacts of the project, aquifer testing, and studies to help determine how extracted fresh water would be replaced. These studies and activities have been undertaken and the results are described and reflected in Section 4.4, Groundwater Resources. CalAm has supplied details about its proposed supply wells and return water proposal. Test borings have helped to characterize the hydrogeologic framework within which the project would operate. Groundwater modeling has been conducted. CalAm also obtained approval to construct a test well on the CEMEX site. That well is in place (and core samples taken during the drilling of the well confirmed the assumptions about hydrogeologic conditions) and test pumping is occurring. Information obtained through test slant well pumping and monitoring was used to refine the aquifer properties represented in the revised version of the groundwater model to test the model's reliability for simulating drawdown from slant well pumping. This preliminary analysis of water rights is based upon detailed and extensive groundwater aquifer characterization and groundwater modeling that has been undertaken by the EIR/EIS preparers to assess the effects of the project on Basin groundwater users.[42]

2.6.2 Project Water Rights

As noted above, CalAm extraction of seawater does not require water rights. However, CalAm extraction of Basin water does require appropriative water rights, as discussed above. The question presented is thus whether Basin water rights holders would be injured or harmed by virtue of withdrawal from the Basin of any amount of water that is not purely seawater. The extensive groundwater modeling conducted for this EIR/EIS and discussed in detail in the Groundwater Resources section and in **Appendix E2** is different from that conducted for the 2015 Draft EIR on the MPWSP. As explained in Chapter 4.4, Groundwater Resources, the modeling is specifically targeted to isolating the change in groundwater levels that would be generated by the MPWSP. This modeling, however, cannot project the amount of Basin water that is expected to be drawn into the supply wells. Due to decades of well-documented seawater intrusion in the area, the technical record shows that any Basin water extracted by the supply wells would be brackish water, which is a combination of ocean water and water that originated from the inland aquifers of the Basin. CalAm proposes as part of the MPWSP and to meet the applicable requirements of the Monterey County Resources Agency Act to return to the Basin (in the manner further described below) the

[42] The EIR/EIS preparers have also had the benefit of working closely with, and receiving input from, the Hydrogeologic Working Group (HWG) that was formed as a result of the proposed settlement in the CPUC proceeding on the MPWSP. The HWG is composed of experts representing myriad parties in the CPUC proceeding with diverse interests related to the Basin, including but not limited to the Monterey County Farm Bureau, the Salinas Valley Water Coalition and CalAm. The EIR/EIS preparers obtained feedback from the HWG as to the groundwater aquifer characterization and the groundwater modeling assumptions. In addition, the HWG has prepared a detailed report that evaluates the results of the test slant well operations and the expected small percentage of project source water that would be fresh water. Input from the HWG work is reflected in Section 4.4, Groundwater Resources.

fresh water portion of the brackish source water. In other words, although the groundwater modeling indicates that the Basin water that could be withdrawn by the supply wells would be brackish and thus not fresh, potable water, the MPWSP would return to the Basin desalinated product water in the amount of the fresh water molecules that make up the withdrawn brackish Basin water. In that the quantity of such fresh water component of the supply water is not currently known, the modeling and the EIR/EIS analysis assess a range of return water between 0 and 12 percent of the source water. As discussed in Section 4.4, Groundwater Resources, the HWG analysis estimates that the long term amount of fresh water within the source water (stabilizing over the first several years of project operation) would be between 1 and 4 percent.

The concept of significant effect under CEQA or NEPA is not necessarily synonymous with harm or injury to water rights holders. In other words, physical change caused by the project might not rise to the level of a significant environmental impact under CEQA or NEPA, but could still cause some harm or injury to a Basin water user (for instance, if the cost to a Basin water rights holder of withdrawing water were to rise even though the environment would not suffer significant impacts). The converse may also be true, that a significant environmental effect under CEQA or NEPA may not cause legal injury in the water rights context. Here, though, the Groundwater Resources section of this EIR/EIS strives to and does in fact effectively and meaningfully analyze two of the three precise concepts of “harm” or “injury” set forth in the Report. These two criteria are reduction in the availability of fresh water and reduction of water quality. In addition, the analysis in the Groundwater Resources section (based upon the groundwater modeling) provides an answer to the third concept of injury set forth in the Report, that of a reduction in groundwater levels that requires users to spend additional funds to extract water.

The impact evaluation in the Groundwater Resources section of this EIR/EIS applied the following relevant thresholds of significance, determining that the project would generate a significant adverse environmental impact if any of the following would occur:

- Substantial depletion of groundwater supplies or substantial interference with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned land uses for which permits have been granted).
- Extraction from the subsurface slant wells were to lower groundwater levels in the Dune Sand Aquifer or the 180-Foot Equivalent Aquifer such that nearby municipal or private groundwater production wells were to experience a substantial reduction in well yield or physical damage due to exposure of well pumps or screens.
- Extraction from the subsurface slant wells would substantially deplete groundwater in the SVGB such that there would be a net deficit in aquifer volume.
- Extraction from the subsurface slant wells would adversely affect groundwater quality by exacerbating seawater intrusion in the SVGB.
- Violation of any water quality standards or degradation of water quality.
- Extraction from the subsurface slant wells would interfere substantially with groundwater recharge.

Applying the thresholds stated above, the analysis concludes that the MPWSP would not result in a significant impact to groundwater resources. It would not reduce, or affect at all, the availability of fresh water (only brackish water from the Basin is projected to be drawn into the MPWSP supply); would not lower groundwater levels in the Basin so as to affect the water supply of any groundwater users or substantially deplete aquifer volume; and would not alter or reduce groundwater quality.

Due to the ongoing and legacy seawater intrusion in the Basin within the radius of influence (the area within which the project could affect groundwater levels), there are few active wells that could potentially be affected by the project. As discussed in detail in the Section 4.4, Groundwater Resources, there are only three active supply wells with well screens across the Dune Sand Aquifer or 180-Foot Equivalent Aquifer within the area where the project may cause groundwater levels to decrease by more than 1 foot but no more than 5 feet.[43] These three wells are located at the Monterey Peninsula Landfill and are used for dust control. Given that the well pumps and the screens are set at least tens of feet below the existing groundwater level, a decrease in the levels of less than 5 feet would not cause injury to this groundwater user. There are six active wells with well screens in the 400-Foot Aquifer. These include the South Well on the CEMEX property, a well on land owned by Ag Land Trust that is used to supply water for dust control, and four private wells. Due to the brackish quality of the groundwater within the 400-Foot Aquifer, these wells would not be expected to supply drinking water. The Groundwater Resources section concludes as to all active wells that a water level decline between 1 and 5 feet would not expose well screens, cause damage, or reduce yield in the groundwater supply wells that could be influenced by the MPWSP. All in all, the project was determined not to result in a significant impact in terms of groundwater supplies either quantitatively or qualitatively.[44] Thus, it appears reasonable to conclude that the MPWSP would not result in harm or injury to the water rights of legal users of water in the Basin in terms of fresh water supply or water quality, two of the Report's three injury criteria relative to the development of legal water rights.

Turning to the third of the three injury criteria set forth in the Report – increased pumping costs – as noted above, the water levels in seven potentially active wells could drop by somewhere between 1 and 5 feet, thus requiring marginally more energy to extract the water from those wells. Any increased pumping costs are not physical effects on the environment under CEQA or NEPA. However, to ensure that those well owners are not injured by MPWSP implementation, CalAm could compensate the well owners for any increased pumping costs causally tied to the MPWSP. Assuming that CalAm were to compensate the owner of these wells for any increased

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43 This is based upon an assumption that no return water (0 percent) is supplied to the Basin, and thus represents a worst case, conservative scenario given that, as discussed in detail in the Groundwater Resources section, the more water that is returned to the Basin as envisioned by the proposed project, the less total impact there would be on the groundwater levels.

44 Furthermore, as detailed in Section 4.4, Groundwater Resources, the feedwater for the project would be extracted out of the capture zone, which contains highly brackish to saline groundwater, and is adjacent to the coast and is recharged by the ocean. Though these potentially affected wells are in the area of influence (also referred to as the cone of depression), which is the area of draw down caused by project pumping, the actual water that would be drawn into the slant wells would not originate from those areas where the wells are outside the capture zone. Water is only drawn into the slant wells in the capture zone. This further supports a conclusion that the project would not injure other Basin users by drawing supply from the inland portion of the aquifers,

pumping costs sustained due to the MPWSP, the slant wells' operation would not result in, or would avoid, injury under the Report's third injury criteria.

Furthermore, CalAm has proposed a mitigation measure (set forth in Section 4.4, Groundwater Resources as Mitigation Measure 4.4-3) to further ensure that Basin groundwater users are not injured. Working with the Monterey County Water Resources Agency, CalAm has agreed to fund the installation of monitoring wells to expand the County's network of groundwater monitoring wells so as to be better able to monitor on an on-going basis the effect of the project slant wells on groundwater within the radius of influence. If the monitoring efforts were to demonstrate that the project were affecting any existing neighboring active wells, CalAm would coordinate with the affected well owner and take both interim and long-term steps to avoid harm (possibly including improving well efficiency, providing a replacement water supply and/or compensating the well owner for increased costs).

In light of the foregoing, it seems reasonable to conclude that the MPWSP would not result in harm or injury to Basin water rights holders such that CalAm would possess the right to withdraw water from the Basin as "developed water."

Substantial evidence in the record indicates that the entirety of the geographical area of the Basin that may be affected by the project contains brackish water rather than fresh water. Based on the groundwater modeling and as discussed in the Groundwater Resources section, while the project may actually improve the Basin's seawater intrusion issue by slowing the seawater interface line from advancing more inland, the project is not forecasted to draw any fresh water through the MPWSP source water supply wells over the life of the project. If indeed no fresh water is withdrawn by the project, then no physical solution in the form of return to the Basin of fresh water (or other off-setting mechanism to alleviate the harm) would be required in order for CalAm to secure and maintain water rights for the project feedwater. If the water in the Basin were to become fresher in the future such that the MPWSP supply wells were drawing fresh water from the Basin, then a physical solution (such as the proposed return component of the project, discussed below) may be needed in order for CalAm to maintain rights to the Basin water for the project.[45]

In any event, the proposed project does include a return water component. CalAm proposes to return to the Basin the percentage of supply water that is determined to have originated from the inland aquifers of the Basin rather than the ocean, i.e., the fresh water component of the brackish water that is extracted by the slant wells as if the brackish water could be segregated between its ocean (seawater) and inland (fresh water) elements. This plan would further protect against injury to Basin groundwater users, and in fact the Basin and its groundwater users could be benefitted by the return of fresh water to the seawater-intruded Basin for use in lieu of groundwater.

[45] The Report addresses the effects on the water rights equation of possible changed conditions in the Basin over time. See Report at pages 43-45. Appropriate physical solutions in the event that the MPWSP wells draw a higher proportion of fresh water in the future may vary depending on whether the higher amount of fresh water results from the MPWSP itself or is due to other causes. The Report states that if increased availability of fresh water were not attributed to the MPWSP and the fresh water extractions could not be returned to the Basin in sufficient quantities, CalAm may have to limit extractions or otherwise modify its project so as to avoid harm to Basin water users.

The Report stated in this regard:

> Cal-Am could use one or more of several possible methods to replace any fresh water it extracts from the Basin. Cal-Am could return the water to the aquifer through injection wells, percolation basins, or through the CSIP. Cal-Am would need to determine which of those methods would be the most feasible, and would in fact, ensure no harm to existing legal users. The feasibility analysis would depend on site-specific geologic conditions at reinjection well locations and at the percolation areas. These studies need to be described and supported in detail before Cal-Am can claim an appropriative right to export surplus developed water from the Basin.

Report at 39. The Report further provides that percolation basins or injection wells would need to be located "where the underlying aquifer does not contain degraded water" (Report at 45); "it would not be appropriate to inject or percolate desalinated water in [the] intruded area, as the water would essentially be wasted." Report at 32.

CalAm has worked with other stake-holders to develop its current proposal for returning water to the Basin. The construct proposed was not an identified option at the time that the SWRCB Report was prepared and thus was not specifically addressed therein, but the proposal appears to advance the goals stated in the Report for returning water to the Basin. CalAm proposes to deliver fully desalinated water to end users for use in lieu of existing groundwater production from the SVGB. The two points of delivery would be (i) to the Castroville Community Services District (CCSD) to supply water for municipal purposes (e.g., typical drinking, bathing, sewer, watering and other non-agricultural water uses) and (ii) to the Castroville Seawater Intrusion Project (CSIP) pond or directly into the reclaimed water CSIP pipe for use by the agricultural users that obtain water through CSIP. Under these return water locales, the clean desalinated water would be provided for municipal or agricultural use (respectively) in lieu of pumping Basin water in an amount equal to the quantity of return water. The return water would be supplied as follows:

1. At the start-up of the MPWSP, 175 acre feet of return water would be provided to CSIP.
2. Each year, 805 acre feet of return water would be provided to CCSD, even if the calculated amount of Basin water withdrawn by MPWSP is less than that amount.
3. To the extent that the calculated amount of Basin water withdrawn by MPWSP exceeds 805 acre feet, that excess amount would be provided to CSIP.

Water is expected to be returned between May and November of the same calendar year as it is withdrawn (see Chapter 3, operating table). As examined by the groundwater modeling and explained in the Groundwater Resources section, this proposed return water plan would improve groundwater conditions in the 400-Foot Aquifer underlying the CSIP, CCSD and adjacent areas because water levels would increase as a result of in-lieu groundwater recharge, and would benefit each of the aquifers by either reducing the area of influence of the MPWSP or by increasing groundwater levels in other areas. Since this return water option would essentially put the Basin in a "no net loss" position in terms of fresh water quantity and would benefit legal water users by providing fresh water for beneficial use in lieu of Basin pumping, the return water plan appears consistent with the Report and enhances the preliminary conclusion that CalAm would likely possess water rights for the project.

2.6.3 Effect of Monterey County Water Resources Agency Act

In 1990, the State Legislature enacted the Monterey County Water Resources Agency Act (the Agency Act), creating the MCWRA as a flood control and water agency. The jurisdictional boundaries of the MCWRA are coterminous with County of Monterey boundaries. Per the Agency Act, MCWRA is charged with preventing the waste or diminution of the water supply in its territory by, among other things, controlling groundwater extractions and prohibiting groundwater exportation from the Salinas River Groundwater Basin. When it enacted the Agency Act, the California State Legislature expressly provided that: “no groundwater from that basin may be exported for any use outside the basin, except that use of water from the basin on any part of Fort Ord shall not be deemed such an export. If any export of water from the basin is attempted, [MCWRA] may obtain from the superior court, and the court shall grant, injunctive relief prohibiting that export of groundwater.” Agency Act at Section 21. The Agency Act further empowers the MCWRA to prevent extraction of groundwater from particular areas of the Basin if needed to protect groundwater supplies. Accordingly, MCWRA adopted Ordinance 3709 (the “Ordinance”) prohibiting well drilling and/or groundwater extraction within certain portions of the northern Salinas Valley between the depths of 0 mean sea level and -250 mean sea level.

This section evaluates the proposed project’s consistency with the Agency Act (and the Ordinance) such that the application of the Agency Act or the Ordinance would not undermine the project’s right to withdraw and supply water and thus, impair the feasibility of the project from water rights and legal feasibility perspectives.

First, the State Water Resources Control Board Report, discussed in detail above, raises the question as to whether the Agency Act would apply to all of the proposed project groundwater extractions given the location of some screens of the slant wells outside the jurisdictional boundaries of the County:

> The applicability of the Agency Act to the MPWSP is unclear. As currently proposed, the project would use slanted wells and have screened intervals located seaward of the beach. Although the project would serve areas within the territory of the MPWSP, the points of diversion for these proposed wells may be located outside the territory of MCWRA as defined by the Agency Act.

Report at 39. The Agency Act’s effect on project feasibility may be minimized by virtue of its application only to water drawn through well screens located within County jurisdiction. Assuming, however, that the Agency Act would apply to the entire project, the Report (while acknowledging that the SWRCB is not the body charged with interpreting the Agency Act) opines that the project would appear consistent with the Agency Act given that the project would return to the Basin any quantity of fresh water withdrawn from the Basin. The Report states:

> Based on the State Water Board’s analysis, as reflected in the Report, the Project as proposed would return any incidentally extracted usable groundwater to the Basin. The only water that would be available for export is a new supply, or developed water. Accordingly, it does not appear that the Agency Act or the Ordinance operate to prohibit the Project. The State Water Board is not the agency responsible for interpreting the Agency Act or MRWCA’s ordinances. It should be recognized, however, that to the extent the language of the Agency

> Act and ordinance permit, they should be interpreted consistent with policy of article X, section 2 of the California Constitution [declaring that the waters of the state shall be put to maximum beneficial use], including the physical solution doctrine . . .

Report at 40. As to Ordinance 3709 specifically, since the CEMEX parcel within which the proposed slant wells would be located is not within the boundaries of Ordinance 3709, the Ordinance would not apply. Therefore, it appears reasonable to conclude that the project would be consistent with the Agency Act and the Ordinance such that those laws would not impair project feasibility.

2.6.4 Effect of Annexation Agreement

In 1996, the MCWRA, the MCWD, the City of Marina, the owners of Armstrong Ranch and then owners of the CEMEX property (RMC Lonestar) entered into an *Annexation Agreement and Groundwater Mitigation Framework for Marina Area Lands* ("Annexation Agreement").[46] The agreement established a framework for management of groundwater from the Basin and included terms and conditions for the annexation of lands (including the Armstrong Ranch and CEMEX properties) to MCWRA's benefit assessment zones as a financing mechanism to fund groundwater resource protection and reduction of seawater intrusion (MCWD, et al. 1996).

Under the Annexation Agreement, MCWD's authority to withdraw potable groundwater from the Basin would be limited to 3,020 afy year until such time as a plan for development of a long-term potable water supply capable of mitigating seawater intrusion was developed and implemented. If and when the Armstrong Ranch property were annexed to MCWD's benefit assessment zones, non-agricultural use of Basin groundwater withdrawn from that property would be capped at 920 afy. If and when the CEMEX property was annexed to MCWD's benefit assessment zones, withdrawal of groundwater from that property would be capped at 500 afy.

The Armstrong Ranch property is not included as part of the proposed MPWSP. However, at the CEMEX property (where CEMEX currently conducts sand mining operations), CalAm proposes construction of subsurface slant wells extending offshore under Monterey Bay and other infrastructure to support the MPWSP Seawater Intake System. Consequently, this section addresses the Annexation Agreement to assess its effect on MPWSP feasibility. Specifically, this section examines: (1) whether annexation of the CEMEX property has occurred, triggering the 500 afy groundwater withdrawal limitation; and (2) whether that withdrawal limitation (if effective) would apply to water withdrawn by the MPWSP slant wells and affect CalAm's right to pump water for the project.

Section 7.3 of the Annexation Agreement provides that "Lonestar Property annexation to the Zones will not take effect until the Lonestar Property has been approved for prior or concurrent annexation into MCWD" (MCWD, et al. 1996). Annexation of the property, now owned by CEMEX, requires compliance with CEQA and discretionary approval by the Monterey County Local Agency Formation Commission (LAFCO). At its June 12, 2012 regular board meeting, the MCWD Board adopted a resolution (No. 2012-42) to initiate CEQA studies and submit to

[46] The MRWPCA was not a party to the Annexation Agreement. However, an Addendum attached as Exhibit G to the Annexation Agreement provides that MRWPCA could later elect to become a party to that Agreement.

LAFCO an application for the annexation of the CEMEX property into the MCWD. However, at its November 30, 2012 meeting, counsel for the MCWD Board reported that no application to LAFCO for annexation of the CEMEX property had been submitted (MCWD, 2012). At that same meeting, the MCWD Board adopted Resolution 2012-88, which requires a super majority vote of 4 of 5 MCWD Board members or a majority of the voters within the 1975 jurisdictional boundaries of MCWD to approve any future land annexation (MCWD, 2012).

The MCWD Board considered the status of this possible annexation at its February 17, 2015 meeting. As of that date, no requisite CEQA document for annexation of the CEMEX property had been started and no LAFCO annexation application for the CEMEX property had been submitted. The Agenda Transmittal from the MCWD staff for the February 17, 2015 Board meeting identified several issues and hurdles that would impair MCWD's ability to move forward with annexation of the CEMEX property. Specifically, based upon meetings with the LAFCO Executive Director and CEMEX officials, the MCWD staff reported that annexation would also require approval of a sphere of influence amendment by LAFCO; such an amendment would need to be consistent with the City of Marina General Plan, which does not envision development of the CEMEX property in a manner that would require MCWD water service; CEMEX does not envision developing its land so as to justify provision of urban-level services by MCWD;[47] and CEMEX would not be willing to pay to the County the fee for annexation to MCWD. In light of these facts, MCWD staff concluded that submitting the required application to LAFCO would be "costly and potentially not achievable in the end." (MCWD, 2012). As of the end of 2017, neither CEMEX nor MCWD have taken further action to pursue annexation of the CEMEX property. MCWD's 2015 Urban Water Management Plan, adopted June 6, 2016, notes that the Annexation Agreement would not take effect until the CEMEX property were annexed. The annexation does not appear likely to occur in the foreseeable future.

Per the terms of the Annexation Agreement, it appears that the 500 afy groundwater withdrawal limitation may currently apply to the CEMEX parcel, though annexation has not occurred. However, even if the 500 afy groundwater withdrawal limitation does currently or were in the future to apply to the CEMEX land, it appears that operation of the MPWSP would still be feasible. First and foremost, the purpose and intent of the withdrawal limitation in the Annexation Agreement is to limit groundwater pumping from the deeper aquifers; the Annexation Agreement is not intended to limit brackish water pumping from the shallow aquifers. Second and also key, the Annexation Agreement places a limit on the overlying water rights of the owner of the CEMEX property, but was not intended to and does not affect "developed water" rights upon which CalAm would rely for the MPWSP. In addition, any return of fresh water to the SVGB, such as the return water program proposed as part of the MPWSP, would keep the Basin whole, serving the purpose of the Annexation Agreement as set forth in Section 1.1 of that Agreement by reducing seawater intrusion and protecting the groundwater resources of the Basin, thus arguably being consistent with the Annexation Agreement.

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[47] In addition, in the interim, CEMEX has agreed with the California Coastal Commission to cease mining operations and make its land available for conservation instead.

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CHAPTER 3
Description of the Proposed Project

3.1 Introduction

3.1.1 Introduction to Project Description

This chapter describes the components of the Monterey Peninsula Water Supply Project (MPWSP) proposed by the California-American Water Company (CalAm). The information in this chapter is intended to provide the reader with an understanding of the construction and operational aspects of CalAm's proposed project[1] and provide a common basis for the analysis of environmental impacts in Chapter 4, Environmental Setting (Affected Environment), Impacts, and Mitigation Measures.

[1] The term "proposed project" is used when referring to CalAm's proposed MPWSP. This term is used when discussing impacts resulting from implementation of all federal, state, and local permits, approvals, and authorizations. The term "proposed action," more commonly used in NEPA documents, refers specifically to MBNMS' three federal proposed actions described in Section 1.3.2.

CalAm is proposing the MPWSP to develop a new water supply for CalAm's Monterey District service area (Monterey District) (see **Figure 3-1**). Section 2.2 of Chapter 2, Water Demand, Supplies, and Water Rights describes the legal decisions and Section 2.3 describes the project demand assumptions that are the basis for the MPWSP's capacity.

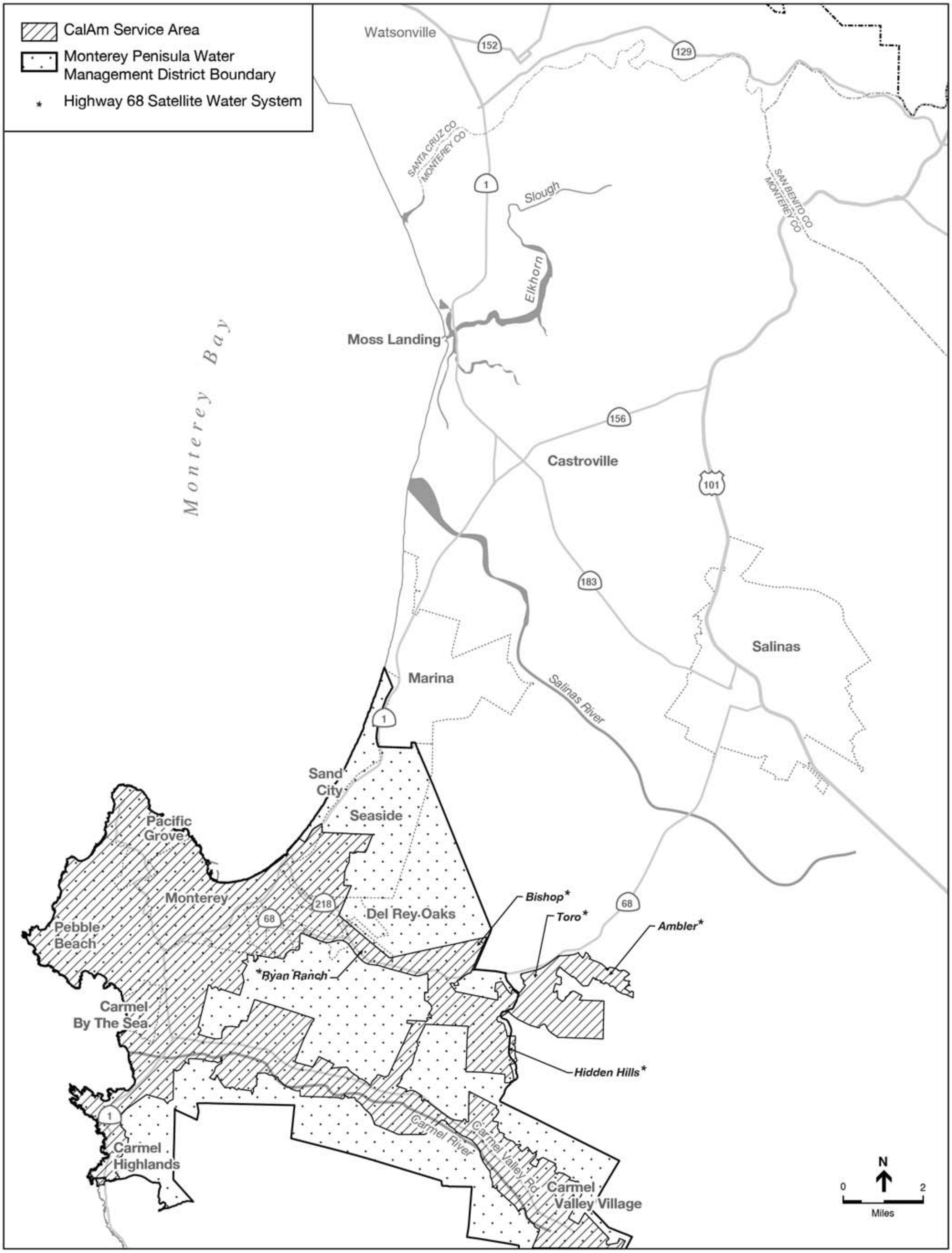
CalAm's application to CPUC contained two capacity options, or build-out scenarios – a 9.6 mgd desalination plant and related facilities, and a reduced-capacity desalination plant (6.4 mgd) with a water purchase agreement for 3,500 acre-feet per year (afy) of advanced treated water from another source, the Pure Water Monterey Groundwater Replenishment (GWR) project. For the purposes of analysis, this EIR/EIS defines the full-capacity option as the "Proposed Project" analyzed in Chapter 4 and addresses the reduced-capacity option as Alternative 5a in Chapter 5. The proposed project assumes that GWR would not be operational.

The project area extends approximately 18 miles, from Castroville in the north to the city of Carmel-by-the-Sea in the south (see **Figure 3-2**). The MPWSP would include construction of a desalination plant located in unincorporated Monterey County on Charles Benson Road, northeast of the City of Marina, and up to nine new subsurface slant wells and conversion of the existing test slant well at the CEMEX active mining area in the northern area of the City of Marina for a total of 10 wells to produce approximately 10,750 afy of desalinated product water. The proposed MPWSP Desalination Plant would have a rated capacity of 9.6 million gallons per day (mgd).

The proposed MPWSP would also include improvements to the existing Seaside Groundwater Basin aquifer storage and recovery (ASR) system facilities, which would enable CalAm to inject desalinated product water into the groundwater basin for subsequent extraction and distribution to customers. The proposed improvements to the ASR system would also increase the efficiency and long-term reliability of the ASR system for injecting Carmel River water into the groundwater basin. The proposed project also includes pump stations, storage tanks, and about 21 miles of water conveyance pipelines.

To inform the final design of the subsurface slant wells and the MPWSP Desalination Plant treatment system, and to collect geologic and hydrogeologic data needed for Federal, state, regional, and local permits for the full-scale project, CalAm built a test slant well at the same location as the subsurface intake system for the proposed project. CalAm operated the test slant well between April 2015 and December 2017 as a pilot program to collect data. Construction of the test slant well and operation of the pilot program was covered under separate environmental review.[2] The test slant well is currently permitted to February 2019 by the CCC and MBNMS, and as a result, CalAm will be allowed to conduct limited periodic maintenance pumping necessary to maintain the test slant well. If the MPWSP with subsurface slant wells at CEMEX is not approved and implemented, the test well would be removed. However, if the proposed

2 In October 2014, Monterey Bay National Marine Sanctuary finished its NEPA review of the construction of the test slant well and the operation of the pilot program and issued an authorization (NOAA-NOS-2014-0078). In September 2014, the City of Marina declined to adopt its Initial Study and Mitigated Negative Declaration and denied CalAm's CDP application for development of the test slant well, and in November 2014, the CCC approved the CDP application on appeal and documented its compliance with CEQA requirements.



SOURCE: ESA, 2013

205335.01 Monterey Peninsula Water Supply Project

Figure 3-1
CalAm Monterey District Service Area

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NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 3-2
Monterey Peninsula Water Supply Project Overview and Index Map

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subsurface slant wells at CEMEX are ultimately approved as part of the proposed project or Alternative 5a, CalAm would convert the test slant well into a permanent well and operate it as part of the subsurface intake system. The conversion and long-term operation of the test slant well as a production well has not been covered under previous approvals and is evaluated in this EIR/EIS as part of the proposed project.

3.1.1.1 Source Water Components and Definitions

Several terms describing source water components are used in this chapter and throughout the EIR/EIS and definitions of these terms are provided here to assist the reader. To begin with, groundwater and ocean water can be described in simple geographic, locational terms as follows:

Groundwater: water located beneath the earth's surface.

Ocean water: water located above the seafloor.

The water chemistry indicates where the water came from (i.e., whether it started as groundwater or ocean water) and how usable it is for domestic and other purposes. In the context of the proposed MPWSP and for purposes of this EIR/EIS, the source water components are defined and used in the EIR/EIS as follows:

Fresh water: water that originated in a groundwater basin through precipitation or rivers and streams; in the context of the MPWSP, fresh water is water that originated within the Salinas Valley Groundwater Basin, identified as containing total dissolved solids (TDS) concentrations of less than 500 milligrams per liter (mg/L), consistent with the secondary drinking water standards established by the SWRCB in Title 22 California Code of Regulations, section 64449, as recommended levels of TDS. TDS is the quantity of dissolved materials in a water sample and is used to quantify the amount of salts in a sample.

Seawater: water that originated in the ocean, identified as containing 33,500 mg/L of TDS, which represents current salinity levels in Monterey Bay.

Brackish water: water that is a combination of seawater and fresh water, and thus contains TDS levels between 500 mg/L and 33,500 mg/L.

Source water (also referred to as feed water): water that would be drawn into the proposed project slant wells and conveyed to the desalination facility. This water would be a combination of brackish groundwater representing the ambient conditions in the water-bearing sediments of the Dune Sand and 180-FTE Aquifers at the coast, and the seawater that is drawn in through the aquifer sediments to recharge the capture zone. The capture zone is the localized region that would contribute source water to the slant wells.

3.1.2 Summary of Changes Made by CalAm to Project Description

Following publication of the Draft EIR/EIS, CalAm proposed several changes to the project description. These changes are reflected in this chapter and in the analysis throughout this Final EIR/EIS. Changes include:

- Removal of the Terminal Reservoir from the proposed project (no longer proposed by CalAm);
- Removal of pump capacity upgrades at Upper Tierra Grande Booster Station from the proposed project (no longer proposed by CalAm);
- Addition of Brine Mixing Box and appurtenances to Brine Disposal Facilities based on discussions with Monterey Regional Water Pollution Control Agency;
- Clarification of Brine Discharge Pipeline diameter (36 inches rather than 30 inches);
- Clarification of pre-treatment building size (4,000 square feet rather than 6,000 square feet)

Other changes have been made throughout the document as a result of public comment and authors' changes. These are described in the introduction to topical sections in Chapter 4.

3.2 Project Components

The MPWSP comprises the following facilities:

- The source water intake system, which would consist of 10 subsurface slant wells[3] (eight active and two on standby) extending into submerged lands of Monterey Bay National Marine Sanctuary (MBNMS), and a Source Water Pipeline
- A full build out 9.6 mgd desalination plant option and related facilities, including pretreatment, reverse osmosis (RO), and post-treatment systems; backwash supply and filtered water equalization tanks; treated water storage tanks; chemical feed and storage facilities; brine storage and conveyance facilities; and other associated non-process facilities
- Desalinated water conveyance facilities including pipelines and a stand-alone pump station
- An expanded ASR system, including two additional injection/extraction wells, the ASR-5 and ASR-6 Wells, and three parallel pipelines, the ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline. These expanded pipelines would convey water to and from the new ASR injection/extraction wells and backwash effluent from the wells to an existing settling basin

Table 3-1 summarizes the proposed MPWSP facilities; for detailed descriptions of the facilities and definitions of technical terms contained in Table 3-1, see Sections 3.2.1 through 3.4. As discussed in Section 1.1, Introduction, CalAm's application for the proposed project also includes an option that would meet all of the project objectives by combining a reduced-capacity desalination plant (6.4 mgd) with a water purchase agreement for 3,500 acre-feet per year (afy) of advanced treated water from another source, the GWR project. That option is discussed in Chapter 5 as Alternative 5; the project description for the GWR is provided as EIR/EIS Appendix H.

[3] The existing test slant well would be converted into a permanent well, and nine additional slant wells would be built.

TABLE 3-1
FACILITIES SUMMARY FOR THE PROPOSED PROJECT

Facility	Description	Purpose
Source Water Intake System		
Subsurface Slant Wells	• Ten slant wells (one existing test slant well converted into a permanent well plus nine new wells), with up to eight wells operating at any given time and two wells on standby. • Each slant well would be up to 970 feet long with a diameter of 22 to 36 inches, and extend beneath the coastal dunes, sandy beach, and the surf zone, terminating 63 to 257 feet seaward of the Mean High Water (MHW) line (i.e., within MBNMS, except SW-10 which would not extend past the MHW line; see Table 3-2 and Figure 3-3a) and at depths of about 200 feet below the seafloor. • The wellheads (surface components) for the ten slant wells would be located at six sites inland of the dune face: two sites with three slant wells each and four sites with one slant well each. • Each slant well would be equipped with a 2,500 gpm, 300 hp submersible well pump for a total feedwater supply of 24.1 mgd from 8 active slant wells. • Each well site would have one wellhead (Sites 1, 3, 4, and 5) or three wellheads (Sites 2 and 6), below-ground mechanical piping vault (meter, valves, gauges), one electrical control cabinet, and one pump-to-waste basin. • Except for Site 1 (test slant well site), the aboveground facilities (at Sites 2 through 6) would be built on a graded pad ranging between 5,250 and 6,025 square feet in area.	The slant wells would draw water from groundwater aquifers that extend beneath the ocean floor (the Dune Sands Aquifer and the 180-Foot-Equivalent Aquifer of the Salinas Valley Groundwater Basin) for use as source water for the MPWSP Desalination Plant.
Source Water Pipeline	• 2.2-mile-long, 42-inch-diameter pipeline • Two hydraulic surge tanks would be located near the collector pipe/Source Water Pipeline connection point, south of the CEMEX access road and inland of the dunes.	This pipeline would convey the source water from the slant wellheads located inland of the dunes, to the MPWSP Desalination Plant. The surge tanks would protect the wells and pipeline infrastructure from hydraulic surge events (i.e., power loss) that could occur in the Source Water Pipeline.
Desalination Facilities		
Pretreatment System	• Pressure filters or multimedia gravity filters would be partially housed within a 4,000-square-foot pretreatment building. • Two 300,000-gallon backwash supply and filtered water equalization tanks • Two 0.25-acre, 10-foot-deep, lined backwash settling basins with decanting system • Multi-purpose pump station would consist of an outdoor concrete pad, with an area of approximately 8,000 square feet, located central to the process facilities, and include the following equipment:	The pretreatment system would treat source water to remove suspended and dissolved contaminants that could damage the RO system, thus increasing the efficiency and lifespan of the RO system. Cartridge filters would remove fine particulates from the filtered water and protect the RO membranes. Filtered water pumps would direct process water through the cartridge filters to RO system.

TABLE 3-1 (Continued)
FACILITIES SUMMARY FOR THE PROPOSED PROJECT

Facility	Description	Purpose
Desalination Facilities (cont.)		
Pretreatment System (cont.)	– Seven cartridge filters – Four filtered water pumps: Two 12-mgd, 350-horsepower (hp) pumps, and two 6-mgd, 200-hp pumps – Two backwash supply pumps (16 mgd, 150 hp each)	Backwash supply pumps would be used to clean the media in the pressure filters.
Reverse Osmosis (RO) System	• First-pass seawater RO system comprising seven modules (six active and one standby), with each module producing 1.6 mgd of “permeate,” that is, the purified water produced through the RO membrane. • Partial second-pass brackish water RO system comprising four modules (three duty and one standby), with each module producing 1.3 mgd of permeate. • The RO units and cleaning systems and chemical storage tanks would be housed within a 30,000-square-foot process and electrical building (membrane process building).	The RO system would remove salts and other minerals from pretreated source water.
Post-treatment System	• Ultraviolet disinfection system (if required) comprising three reactors (two active and one standby) that would be housed in the membrane process building. • Carbon dioxide system comprising one 120-ton storage tank and feed equipment in a concrete enclosure that would be located next to membrane process building • Lime system comprising two 20,000-gallon storage tanks and feed equipment in a concrete enclosure that would be located next to membrane process building	If required by the State Water Resources Control Board (SWRCB) Division of Drinking Water, the UV Disinfection system would provide additional primary disinfection. The carbon dioxide and lime systems would adjust the hardness, pH, and alkalinity of the desalinated product water in accordance with drinking water requirements.
Chemical Storage (Membrane Process Building)	The following treatment chemicals would be housed in the membrane process building. The storage tanks/drums would sit on concrete stalls with secondary containment curbs to contain inadvertent spills of hazardous treatment chemicals: • Sodium hypochlorite - two 6,500-gallon storage tanks • Sodium hydroxide - one 5,200-gallon tank • Sulfuric acid -one 10,000-gallon tank • Sodium bisulfite - one 6,000-gallon tank • Zinc orthophosphate -one 5,600-gallon tank • Anti-scalant - one 6,300-gallon tank • Non-ionic polymer – multiple 55-gallon drums	The sodium hypochlorite system would generate low-concentration chlorine solution using salt and electricity; and the chlorine would provide primary and residual disinfection for drinking water. The sodium hydroxide system would adjust the pH and alkalinity of the desalinated product water and disinfect the water in accordance with drinking water requirements. The sulfuric acid system would be used to clean the RO membranes. The sodium bisulfite system would be used to dechlorinate process waters and brine in the treatment, cleaning and disposal processes. The zinc orthophosphate system would be used as a corrosion inhibitor in the treated water to protect the distribution system.

TABLE 3-1 (Continued)
FACILITIES SUMMARY FOR THE PROPOSED PROJECT

Facility	Description	Purpose
Desalination Facilities (cont.)		
Chemical Storage (Membrane Process Building) (cont.)		The anti-scalant system would be used in the treatment process to reduce fouling and protect the RO membranes. The non-ionic polymer system would be used in the treatment process to improve settling of particulates in the used washwater from the pressure filters before the clarified washwater was returned to the plant for treatment or disposed of with the brine.
Administrative Building	• 4,000- to 6,000-square-foot building	This building would house restrooms, locker rooms, break rooms, conference rooms, electrical controls, laboratory facilities, equipment storage and maintenance, and electrical service equipment.
Brine Storage and Disposal Facilities		
Brine Storage and Disposal	• 3-million-gallon brine storage basin • 1-mile-long, 36-inch-diameter Brine Discharge Pipeline with Brine Mixing Box and appurtenances • Two 6 mgd, 40 hp brine disposal pumps • Brine aeration system	Brine concentrate produced during the RO process would be conveyed to the brine storage basin located at the MPWSP Desalination Plant. The Brine Discharge Pipeline would convey decanted effluent from the pretreatment filtration backwash cycle and RO concentrate produced by the RO system (both located in the membrane process building) and brine stored in the brine storage basin to the Brine Mixing Box before being conveyed to the headworks of the existing MRWPCA outfall. The brine aeration system would maintain dissolved oxygen concentrations in the brine at acceptable levels.
MRWPCA Ocean Outfall Pipeline and Diffuser (existing)	• Existing 2.3 mile-long, 60-inch diameter pipe (onshore portion) • Existing 2.1-mile-long, 60-inch and 48-inch-diameter pipe (offshore portion) • Existing 1,100-foot-long diffuser with 172 ports, each 2 inches in diameter and spaced 8 feet apart	Brine and pretreatment backwash effluent from the desalination plant would be conveyed from the headworks, to the existing ocean outfall pipeline. The existing outfall terminates at a diffuser located offshore in MBNMS that would discharge the brine concentrate or brine blended with treated wastewater effluent to Monterey Bay.
Desalinated Water Conveyance and Storage Facilities		
Treated Water Storage Tanks	• Two approximately 103-foot-diameter, 1.75-million gallon above ground treated water storage tanks (with a total combined storage volume of 3.5 mg).	The treated water storage tanks would serve as holding tanks from which water would be pumped to either the CalAm water system, the existing CSIP pond or the Castroville Pipeline.
Desalinated Water Pumps	• Desalinated water pumps and equipment would be located at a multi-purpose pump station and would include the following equipment: – Two 4.8 mgd, 600 hp treated water pumps – Two 2.4 mgd, 300 hp treated water pumps – Two 1.4 mgd, 10 hp Salinas Valley return flow pumps	The treated water pumps would pump desalinated water from the MPWSP Desalination Plant through distribution pipelines to the customers in the Monterey District service area. The Salinas Valley pumps would direct desalinated water (i.e., Salinas Valley return flows) from the MPWSP Desalination Plant to the Castroville Community Services District (CCSD) and/or CSIP system.

TABLE 3-1 (Continued)
FACILITIES SUMMARY FOR THE PROPOSED PROJECT

Facility	Description	Purpose
Desalinated Water Conveyance and Storage Facilities (cont.)		
New Desalinated Water Pipeline	• 3.3-mile-long, 36-inch-diameter pipeline	This pipeline would convey desalinated water from the treated water storage tanks at the MPWSP Desalination Plant to the new Transmission Main at Reservation Road.
New Transmission Main	• 6-mile-long, 36-inch-diameter pipeline	This pipeline would convey desalinated water between the new Desalinated Water Pipeline at Reservation Road, crossing U.S. Army-owned property along General Jim Moore Blvd. to the existing Phase I ASR Facilities where it would connect to CalAm's existing water supply distribution system at the General Jim Moore Boulevard/Coe Avenue intersection.
Carmel Valley Pump Station	• 3 mgd, 100 hp pump station	This 500-square-foot facility would provide the additional water pressure needed to pump water through the existing Segunda Pipeline into Segunda Reservoir.
Interconnection Improvements for Highway 68 Satellite Systems a) Ryan Ranch–Bishop Interconnection b) Main System–Hidden Hills Interconnection	• 1.1-mile-long, 8-inch-diameter pipeline • 1,200-foot-long, 6-inch-diameter pipeline • One new 350 gpm pump	These interconnection pipelines and associated improvements would allow CalAm to convey MPWSP water supplies to the Ryan Ranch, Bishop, and Hidden Hills satellite water systems.
Castroville Pipeline	• 4.5-mile-long, 12 inch-diameter pipeline extending from MPWSP Desalination Plant to Castroville (see Figures 3-11 and 3-12)	This pipeline would convey desalinated water from the MPWSP Desalination Plant to the Castroville Seawater Intrusion Project (CSIP) distribution system and the CCSD Well #3. Desalinated water would be delivered to the CSIP system via a new connection point located approximately halfway along the pipeline alignment at Nashua Road and Monte Road. At the northern pipeline terminus, desalinated water would be delivered to the CCSD Well #3 at Del Monte Avenue and Merritt Street.
Pipeline to CSIP Pond	• 1.2-mile-long, 12-inch-diameter pipeline (see Figure 3-5)	This pipeline would convey desalinated water from the MPWSP Desalination Plant to the CSIP pond for subsequent delivery to agricultural users in the Salinas Valley.
ASR System		
Two new ASR Injection/Extraction Wells, referred to as ASR-5 and ASR-6 Wells	• Two proposed 1,000-foot-deep injection/extraction wells (ASR-5 and ASR-6 Wells) with a combined injection capacity of 2.2 mgd and extraction capacity of 4.3 mgd	The proposed new ASR injection/extraction wells would be used to inject Carmel River supplies and desalinated water into the Seaside Groundwater Basin for storage. The two proposed ASR wells would be located on U.S. Army-owned property in the Fitch Park neighborhood of the Ord Military Community. The four existing ASR wells would also be used for these purposes. During periods of peak demand, the stored water would be extracted and delivered to customers.

TABLE 3-1 (Continued)
FACILITIES SUMMARY FOR THE PROPOSED PROJECT

Facility	Description	Purpose
ASR System (cont.)		
ASR Pipelines: 1. ASR Recirculation Pipeline 2. ASR Conveyance Pipeline 3. ASR Pump-to-Waste Pipeline	• Three parallel 0.9-mile-long, 16-inch-diameter pipelines	ASR Recirculation Pipeline would be used to convey water from existing conveyance pipelines and infrastructure at Coe Avenue and General Jim Moore Boulevard to the new ASR-5 and ASR-6 Wells for injection. ASR Conveyance Pipeline would be used to convey extracted ASR water supplies to the existing infrastructure at Coe Avenue/General Jim Moore Boulevard. ASR Pump-to-Waste Pipeline would convey backflush effluent produced during routine maintenance of the ASR-5 and ASR-6 Wells to the existing Phase I ASR settling basin. Portions of the ASR Recirculation, ASR Conveyance, and ASR Pump-to-Waste pipelines would be located on U.S. Army-owned property between the proposed ASR wells and the southern end of U.S. Army property located north of the Coe Avenue/General Jim Moore Boulevard intersection.

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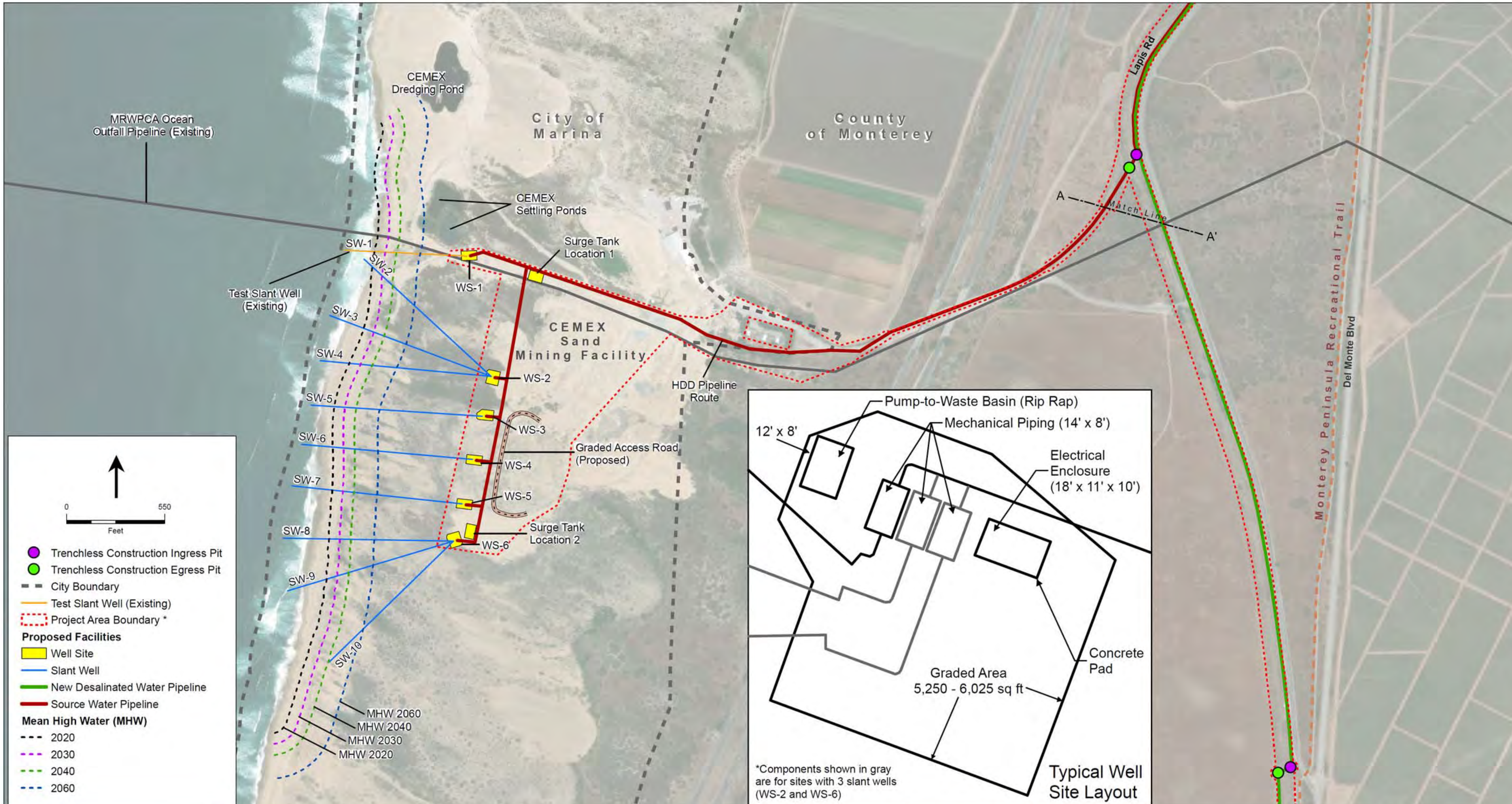

NOTE:
*Project area boundary refers to the area within which all construction related disturbance would occur.

SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 3-3a
MPWSP Seawater Intake System

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3.2.1 Source Water Intake System

3.2.1.1 Subsurface Slant Wells

The source water intake system would include 10 subsurface slant wells at the coast (eight active and two on standby at any given time) that would draw water from aquifers that extend beneath the ocean floor, for treatment at the MPWSP Desalination Plant. When compared to vertical wells, slant wells are a new and evolving technology that allows for a substantially increased screen length in the target water source, resulting in higher production rates than vertical wells. The subsurface slant wells would be located in the city of Marina, about 2 miles south of the Salinas River, in the retired mining area of the CEMEX sand mining facility (see **Figure 3-3a**). The slant wells would be built south of the existing CEMEX access road.

Test Slant Well and Long-Term Aquifer Pump Test

As described in Section 3.1, CalAm built a test slant well in the CEMEX retired mining area and operated the test slant well for over two years as a pilot program to collect data. The environmental effects associated with construction and operation of the test slant well were evaluated in accordance with CEQA and NEPA requirements by the California Coastal Commission (CCC) and MBNMS in November 2014, respectively. The test slant well was originally permitted to operate until February 2018, but CalAm requested and was granted an extension from the CCC and MBNMS. As a result, CalAm will be allowed to conduct limited periodic pumping necessary to maintain the test slant well, through February 2019. The installation and operation of the test slant well is not part of the proposed project being evaluated in this EIR/EIS due to the separate environmental review conducted in 2014. If the MPWSP with subsurface slant wells at CEMEX is not approved and implemented, the test well will be decommissioned.

The site-specific field data collected during the pilot program are intended to inform the final design of the subsurface slant wells, the overall source water intake system, and the MPWSP Desalination Plant treatment system. The test slant well facilities include the test well, a submersible well pump, a wellhead vault, electrical facilities and controls, temporary flow measurement and sampling equipment, monitoring wells, and a temporary pipeline connection to the adjacent MRWPCA ocean outfall pipeline for discharges of the test water. The test slant well was drilled at 19 degrees below horizontal, is 685 feet long, and is screened[4] for 450 linear feet at depths corresponding to both the Dune Sand Aquifer and the underlying 180-Foot-Equivalent (FTE) Aquifer of the Salinas Valley Groundwater Basin (see Section 4.4, Groundwater Resources, for aquifer descriptions).

Upon completion of the aquifer pump testing, CalAm proposes to convert the test slant well into a permanent well and operate it as part of the MPWSP source water intake system. Both the construction of the additional conveyance and treatment facilities needed to convert the test slant well into a permanent well and the long-term operation and maintenance of the converted test slant

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4 A well screen is a perforated steel or plastic device placed within the well casing that draws water from the surrounding geologic formations but which minimizes sediment from entering the well. The depth of the screen is based on geologic and hydraulic criteria.

well are part of the proposed project, and are thus evaluated in this EIR/EIS. Sections 3.2.1.2 through 3.2.2.6, below, describe the conveyance and treatment facilities for the source water produced at the subsurface slant wells during long-term operations.

Permanent Slant Wells

Each of the 10 subsurface slant wells (the converted test slant well and nine new wells) would have a submersible pump to provide a total combined 24.1 mgd of feedwater when eight wells are operating. The slant wells would be drilled from an onshore location and would extend under the seafloor within MBNMS using a 36-inch- to 22-inch-diameter steel casing. The completed pump columns and wellheads would be 10 to 12 inches in diameter.

The nine new permanent slant wells would be up to 970 feet long and drilled at approximately 14 degrees below horizontal to extend offshore to a distance of 63 (Slant Well-2) to 257 (Slant Well-8) feet seaward of the 2020 MHW line (except #10, which would not extend past the MHW line) and to a depth of 190 to 210 feet beneath the seafloor. This means that although all construction activities and ground disturbance would occur above mean sea level and landward of the MHW line, the well casings would extend subsurface and seaward of the MHW line and below the seafloor within MBNMS. Each well would be screened for approximately 400 to 800 linear feet at depths corresponding to both the Dune Sand Aquifer and the underlying 180-Foot-Equivalent (FTE) Aquifer of the Salinas Valley Groundwater Basin. CalAm would operate eight wells at a time at approximately 2,100 gallons per minute (gpm) per well and maintain the other two wells on standby.

Table 3-2 presents the total length of each slant well extending seaward of the MHW line. Because the slant wells would be drilled at a 14-degree angle, the horizontal distance to which the wells would extend seaward of the MHW line would be slightly shorter than the length of the well casing. This is illustrated in **Figure 3-3b**, **Illustrative Cross-Sectional View of Subsurface Slant Wells**.

The 10 slant wells would be located at six sites inland of the dune face: four sites (the test slant well site and three new sites) would each have one slant well, and two sites would have three slant wells (see Figure 3-3a). The well sites are numbered sequentially, with Site 1 being the northernmost site and Site 6 the southernmost site. The test slant well would be converted into a permanent well at Site 1. The nine new permanent wells would be drilled over a total distance of about 900 feet at Sites 2 through 6. The wellheads of the three new permanent wells at Site 2 would be located about 600 feet south of Site 1. Sites 3, 4, and 5 would be spaced approximately 250 feet apart and would have one slant well each. Site 6 would have three wells.

Sites 1 through 6 would include the following facilities: aboveground wellhead(s), a below-ground mechanical piping vault (12 feet by 6 feet by 6 feet) for meters, valves, gauges, etc. per well, an aboveground electrical enclosure, and a pump-to-waste basin. Each wellhead would be located aboveground for ease of maintenance. Each slant well would be equipped with up to a 2,500 gpm, 300 hp submersible well pump. The electrical controls for operation of the slant wells would be housed in a single-story, 17-foot-long by 10-foot-wide, 10-foot-tall fiberglass enclosure located at each of the six

TABLE 3-2
LENGTH OF PERMANENT SLANT WELLS SEAWARD OF MEAN HIGH WATER LINE

Well	Total Length	2020		2040		2060	
		Offshore	Onshore	Offshore	Onshore	Offshore	Onshore
Test Slant Well, SW-1	685	166	519	290	395	423	262
SW-2	970	63	907	219	751	385	585
SW-3	966	202	764	325	641	455	511
SW-4	961	162	799	292	669	431	530
SW-5	961	130	831	254	707	385	576
SW-6	961	174	787	298	663	428	533
SW-7	957	225	732	347	610	479	478
SW-8	955	257	698	379	576	510	445
SW-9	970	228	742	357	613	500	470
SW-10	970	0	970	0	970	262	708

NOTES:

All lengths in feet.
MHW = Mean high water - A tidal datum. The average of all the high water heights observed over the National Tidal Datum Epoch. The 2020 MHW at the Monterey Tide Gauge NOAA#9413450 equals 1.53 m (5.02 ft) NAVD88, considering a high sea level rise scenario of 8.1 cm (3.2 in) by 2020 (5.46 ft by 2100). See also Appendices C1 and C2.

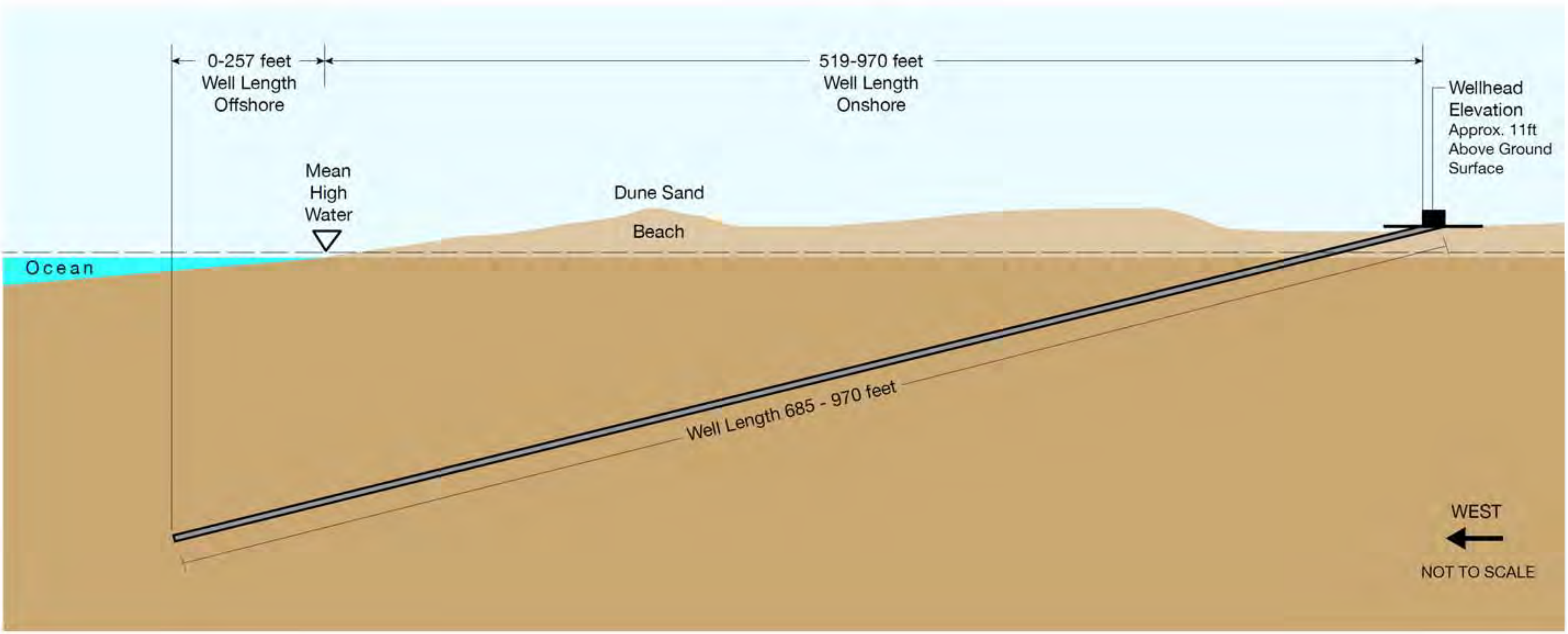
The lengths provided in this table indicate the total length of the well casing extending seaward of the MHW line. Because the slant wells would be drilled at an approximately 14-degree angle, the total horizontal distance seaward of the MHW line would be slightly shorter than the length of the well casing. The total horizontal distance seaward of the MHW line can be determined by dividing the length by 1.03.

SOURCE: Geoscience, 2017

well sites. Each site would also have a pump-to-waste basin for the percolation of turbid water produced during slant well startup and shutdown. The pump-to-waste basin would be constructed of rip rap material, approximately 1 to 2 feet deep and 12 feet by 8 feet in size. The new permanent slant wells and associated infrastructure at Sites 2 through 6 would be constructed on a 5,250- to 6,025-square-foot graded pad. A 750-foot-long, 42-inch-diameter buried pipe would collect the source water pumped from Sites 2 to 6 and convey it to the proposed buried Source Water Pipeline located at the existing CEMEX access road.

3.2.1.2 Source Water Pipeline

The approximately 2.2-mile-long, 42-inch-diameter buried Source Water Pipeline would convey the source water from the well sites to the MPWSP Desalination Plant at Charles Benson Road. From the slant wells, the proposed Source Water Pipeline would generally follow the CEMEX access road and would run parallel to the MRWPCA's existing outfall pipeline for approximately 0.7 mile (see **Figure 3-3a**). Approximately 500 feet east of Highway 1, the Source Water Pipeline would veer northeast along a dirt path for roughly 1,000 feet to Lapis Road. There, a jack and bore method would be used to install the pipeline under the existing railroad tracks. The alignment would continue north within the Transportation Agency for Monterey County (TAMC) right-of-way (ROW), along Lapis Road for about 0.5 mile. Just south of where Lapis Road meets Del Monte Boulevard, the pipeline would turn east across Del Monte Boulevard and continue east



SOURCE: Geoscience, 2017

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Figure 3-3b
Illustrative Cross-Sectional View of Subsurface Slant Wells

for 0.8 mile to the MPWSP Desalination Plant site at the east end of Charles Benson Road. This 0.8-mile-long segment of pipe would be installed parallel to, and north of, the Charles Benson Road right-of-way (i.e., outside of the paved road). The land that borders Charles Benson Road to the north is separated from Charles Benson Road by a row of mature Monterey cypress and eucalyptus trees and a portion of this land is currently under agricultural production. The pipeline would be installed east-to-west along the north side of the row of trees and along the southern boundary of the agricultural land (see **Figures 3-4** and **3-5a**). CalAm is negotiating an easement with the landowners for installation of the Source Water Pipeline, as well as the new Desalinated Water Pipeline and the Castroville Pipeline, outside of the paved roadway.

Source Water Pipeline – Optional Alignment

In case CalAm is unable to secure an easement from the landowners along the north side of Charles Benson Road, this EIR/EIS also evaluates an optional alignment for the Source Water Pipeline. The optional alignment would be identical to the alignment described above, except that the 0.8-mile-long segment along Charles Benson Road would be installed within the paved Charles Benson Road right-of-way (as opposed to north of and outside of the right-of-way) (see **Figures 3-4** and **3-5a**). Construction activities within Charles Benson Road would be limited to after-hours/ nighttime construction, to avoid conflicts with the operations of the Waste Management District.

3.2.2 MPWSP Desalination Plant

CalAm would build the MPWSP Desalination Plant in unincorporated Monterey County, on the upper terrace (approximately 25 acres) of a 46-acre vacant parcel on Charles Benson Road, northwest of the MRWPCA Regional Wastewater Treatment Plant and the Monterey Regional Environmental Park (see **Figure 3-5a**). In 2012, CalAm bought this parcel for the MPWSP Desalination Plant. The facilities to be built at the MPWSP Desalination Plant include a pretreatment system, an RO system, a post-treatment system, backwash supply and filtered water equalization tanks, desalinated product water storage and conveyance facilities, brine storage and disposal facilities, and an administration building and laboratory facility. Existing roads would provide access to the site. The proposed project would create approximately 15 acres of impervious surfaces associated with the desalination facilities, buildings, driveways, parking, and maintenance areas. The subsections that follow describe these facilities. **Figure 3-5b** presents the preliminary site plan.

The MPWSP Desalination Plant would have a rated production capacity of 9.6 mgd and a maximum production capacity[5] of 11.2 mgd.

3.2.2.1 Pretreatment System

Source water from the subsurface intake wells would be conveyed directly to the pretreatment system. The purpose of the pretreatment system would be to improve the quality of source water

5 Maximum production capacity (11.2 mgd) is the full physical capacity of the MPWSP Desalination Plant with all seven RO modules in service. As described in Section 3.4.1, after shutdown periods, CalAm may need to operate the desalination plant at maximum production capacity of 11.2 mgd to catch up on production; however, the total annual production would not exceed an average of 9.6 mgd (Svindland, 2014).

being treated by the RO system, described in Section 3.2.2.2, below, in order to increase the efficiency of RO treatment. The pretreatment requirements for seawater collected by the proposed slant wells will be determined through the operation of the test slant well and pilot program, and would include pressure filters or multimedia gravity filters, a backwash supply storage tank, and backwash settling basins. The pretreatment system could also include coagulation, flocculation,[6] or membrane filtration. The pretreatment system would have the capacity to process 24.1 mgd of seawater.

The pressure filters or multimedia gravity filters would be located within the MPWSP Desalination Plant site. If pressure filters are used, multiple parallel fiberglass or lined steel tanks would be partially enclosed in a 30-foot-tall, 4,000-square-foot building. If gravity filters are used, they would be installed in below-grade, multi-cell concrete structures. A low dosage of chlorine would be added to the source water to separate out iron and manganese, and the precipitate would be removed by the filters. In addition, the pretreatment system could play an important role in pathogen removal. Because a portion of the source water supply would be groundwater under the influence of surface water as defined under the U.S. Environmental Protection Agency (USEPA) Surface Water Treatment Rule,[7] the source water would be subject to the Surface Water Treatment Rule and the Long-Term 2 Enhanced Surface Water Treatment Rule.

The pretreatment process would produce approximately 23.6 mgd of pretreated, filtered source water. The pretreated source water would be conveyed to two 300,000-gallon backwash supply and filtered water equalization tanks. The majority of the pretreated source water would then be pumped directly to the RO system (see Section 3.2.2.2, below).

Pretreatment filters would require backwashing about once each day. A portion of the pretreated source water would be used for this purpose. The backwash supply water would be conveyed from the backwash supply and filtered water equalization tanks to the pretreatment filters by gravity flow. Chlorine may be added to the backwash supply to control bacterial growth on the filters.

Waste effluent produced during routine backwashing would flow via gravity from the pretreatment filters to two 0.25-acre, 6-foot-deep open backwash settling basins with impermeable liners to prevent the waste effluent from infiltrating into the ground. Suspended solids in the waste effluent would settle to the bottom of the basins, and the clarified water would be decanted. Approximately 0.4 mgd of decanted and dechlorinated backwash water would be blended with brine produced by the RO system, and discharged to the existing MRWPCA ocean outfall and diffuser for disposal into the waters of MBNMS. The decanted backwash water could be blended with source water before undergoing pretreatment and the RO process. Sludge formed by the solids in the waste effluent would be periodically removed from the backwash settling basins and disposed of at a sanitary landfill.

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[6] Flocculation is a process used to separate suspended solids from water. Flocculation involves the addition of an agent to water to promote the aggregation of suspended solids into particles large enough to settle or be removed.

[7] The USEPA Surface Water Treatment Rule (40 CFR 141.70-141.75) seeks to prevent waterborne diseases caused by viruses, *Legionella*, and *Giardia lamblia*. The rule requires that water systems filter and disinfect water from surface water sources to reduce the occurrence of unsafe levels of these microbes.

NOTE:
*Project area boundary refers to the area within which all construction related disturbance would occur.

SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 3-4

Proposed Pipelines - Lapis Road and Neponset Road Vicinity

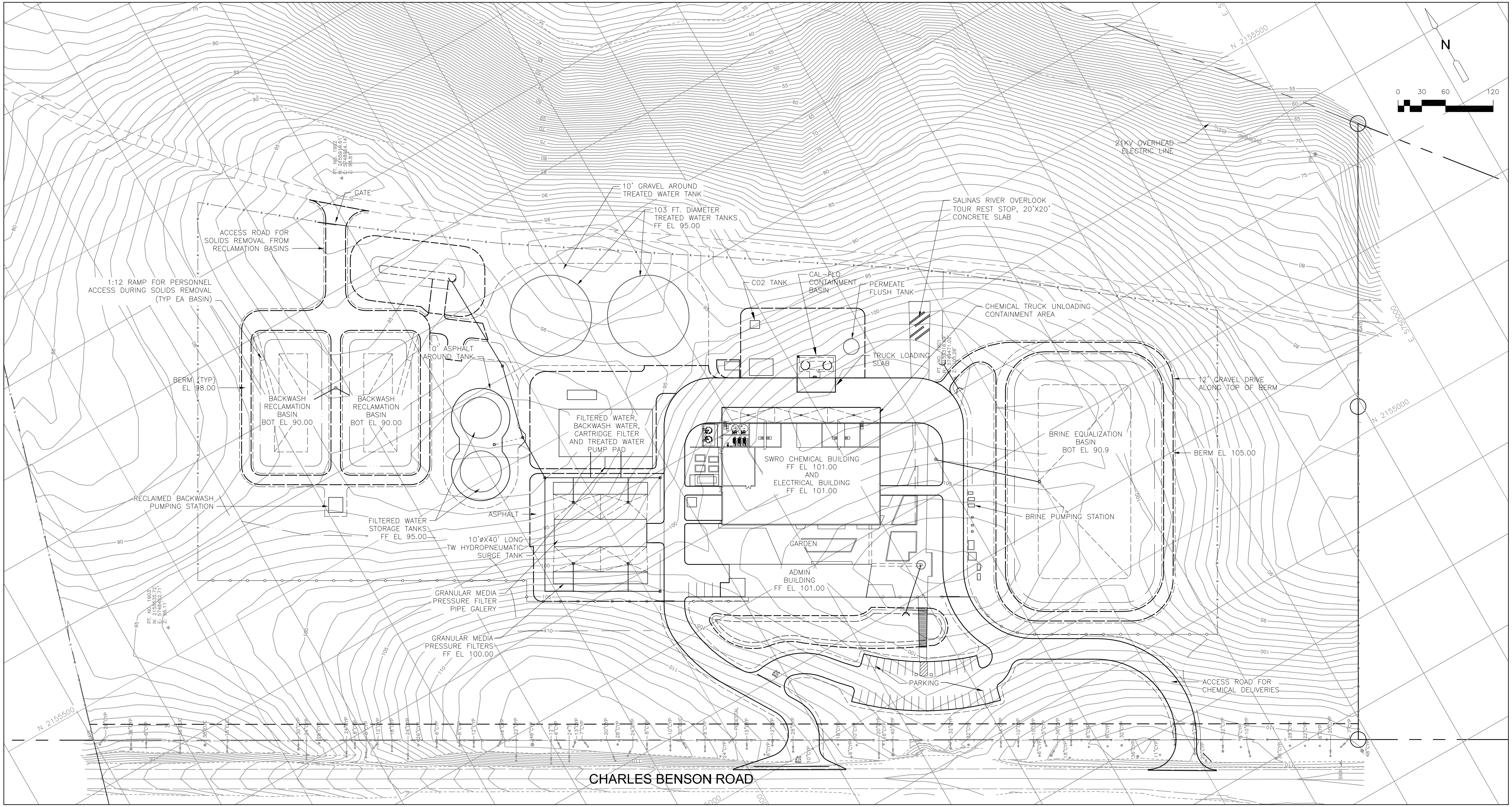
205335.01 Monterey Peninsula Water Supply Project

Figure 3-5a

MPWSP Desalination Plant

NOTES:
*Project area boundary refers to the area within which all construction related disturbance would occur.
** This facility was approved by MRWPCA & MPWMD in October 2015 as part of the Pure Water Monterey Groundwater Replenishment Project. The Construction schedule for this facility is currently unknown.

SOURCE: ESA, 2016



SOURCE: CDM Smith, 2014

205335.01 Monterey Peninsula Water Supply Project

Figure 3-5b
MPWSP Desalination Plant–Site Plan

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A multi-purpose pump station located near the center of the MPWSP Desalination Plant would be built on an outdoor concrete pad with an approximate area of 8,000 square feet. The pump station would include pumping equipment related to pretreatment as well as other processes described later in this section (e.g., treated water and Salinas Valley return water conveyance). Equipment would include seven cartridge filters; four filtered water pumps (two 12 mgd and 350 hp each; and two 6 mgd and 200 hp each); two backwash supply pumps (16 mgd and 150 hp each); four treated water pumps (two 4.8 mgd and 600 hp each; and two 2.4 mgd and 300 hp each); two Salinas Valley return pumps (1.4 mgd and 10 hp each); and associated piping, valves, and instruments.

3.2.2.2 Reverse Osmosis System

RO is an ion separation process that uses semipermeable membranes to remove salts and other minerals from saline water. Pretreated source water is forced at very high pressures through RO membranes. Water molecules, which are smaller than salt and many other impurities, are able to pass through the membranes. A portion of the source water passes through the RO membranes to produce “permeate,” or desalinated water; the source water that does not pass through the membranes increases in salt concentration and is discharged as brine, as described in more detail below.

The RO system would be housed in an approximately 30-foot-tall, 30,000-square-foot membrane process building located in the central portion of the MPWSP Desalination Plant site. This building would also house the UV disinfection system (if required) and the cleaning system for the RO membranes (see descriptions below).

The RO process would consist of a first-pass system and a partial (40 to 50 percent) second-pass system. The first-pass RO system would comprise RO modules (six active and one standby), each sized to produce 1.6 mgd of permeate. Variable-speed, low-pressure pumps would pump pretreated source water to variable-speed, high-pressure, first-pass RO feed pumps. The high-pressure RO feed pumps would deliver flow to the first-pass membrane arrays.

Low-pressure, variable-speed pumps would be used to pump the 40 to 50 percent of the first-pass permeate that has a higher concentration of dissolved solids than the rest of the permeate to the second-pass membrane arrays. The second-pass system would reduce the concentrations of these dissolved solids (boron, chloride, and sodium) and would comprise four RO modules (three active and one standby), each sized to produce 1.3 mgd of permeate. The second-pass permeate would then be blended with the bypassed portion of the first-pass permeate to meet required desalinated water quality standards. Approximately 23.6 mgd of pretreated source water would be needed to produce 9.6 mgd of desalinated water.

The RO process would incorporate an energy recovery system that uses pressure-exchange technologies. The use of high-pressure pumps to force saline water through the RO membranes would produce a concentrated brine solution, known as RO concentrate, in a continuous high-pressure stream. Pressure exchangers would be employed to transfer the energy from the high-pressure brine stream to the source water stream to reduce energy demand and operating costs.

The accumulation of salts or scaling (from to microbial contamination, turbidity, and other contaminants such as iron and manganese) on the RO membranes causes fouling, which reduces membrane performance. The pretreatment system described above would reduce fouling of the RO membranes, increasing the efficiency of the RO system and extending the useful life of the RO membranes. However, the RO system still would require cleaning two to three times per year. The RO cleaning system would be housed in the same building as the RO system and would include chemical storage, chemical feedlines, and a collection tank. System operators would clean the RO membranes by circulating a cleaning solution, made of strong bases or acids, through the membranes and then flushing the membranes with clean water to remove the spent cleaning solution and waste effluent from the RO system. The spent cleaning solution and waste effluent would be discharged into a collection tank, chemically neutralized, and discharged to the sanitary sewer system at the eastern portion of the MPWSP Desalination Plant site.

CalAm would install a 750-kilowatt (kW) (1,000 hp) emergency diesel fuel-powered generator and a 2,000-gallon, double-walled, aboveground diesel storage tank next to the process building. The generator would provide backup power for critical desalination plant facilities (e.g., lights, electrical controls, and high-service pumps to empty the clearwells) during power outages. Electrical power service and facilities for normal (non-emergency) operations are described below in Section 3.2.5.

3.2.2.3 Post-treatment System

After leaving the RO system, the desalinated water would pass through a post-treatment system to make the water more compatible with the other water supply sources in the CalAm system and provide adequate disinfection prior to distribution to customers. Facility operators would use metering pumps and chemical feedlines to dose the post-treatment chemicals through the proper injection points along the post-treatment system. Post-treatment facilities would include chemical feedlines and injection systems for lime and carbon dioxide. Carbon dioxide would be added to adjust alkalinity; lime would be added to adjust calcium hardness; sodium hydroxide would be used to adjust pH; and sodium hypochlorite would be added for disinfection. In addition, an ultraviolet disinfection system may be required to comply with pathogen removal/inactivation standards established by the Surface Water Treatment Rule and Long Term 2 Enhanced Surface Water Treatment Rule. If required, the ultraviolet disinfection system would comprise three reactors, two active and one standby, housed in the membrane process building. The final design of post-treatment facilities would be based on the water quality data collected during operation of the test slant well and pilot program and the results of a geochemical mixing study.[8] Any adjustments made to the post-treatment system during final design of the MPWSP Desalination Plant within the 25-acre development area would not affect any of the analyses or conclusions in this EIR/EIS. All treatment chemicals would be transported, stored and used in accordance with regulatory requirements.

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[8] The geochemical mixing study will identify water quality parameters for the desalinated product water to ensure that any desalinated product water injected into underground storage via the ASR system would not adversely affect groundwater quality in the Seaside Groundwater Basin. Refer to Impact 4.4-4 in Section 4.4, Groundwater Resources, for additional discussion of the geochemical mixing study.

3.2.2.4 Chemical Use and Storage

As noted in previous sections, facility operators would use various chemicals to treat the water as it passes through the pretreatment, RO, and post-treatment processes to ensure the water meets drinking water quality requirements and is compatible with native groundwater in the Seaside Groundwater Basin.[9] The chemicals used during the desalination process would be stored onsite in accordance with applicable regulatory requirements. Chemical storage facilities would include secondary concrete containment, alarm notification systems, and fire sprinklers. **Table 3-3** summarizes the chemicals that would be used during the desalination process and the projected annual usage amounts. The pre-treatment and post-treatment chemicals would be housed in various 5,000- to 10,000-gallon bulk storage tanks located inside or next to the membrane process building. RO cleaning chemicals would be stored in smaller containers. Sumps and sump pumps within the chemical containment area and loading areas would collect and contain any chemicals accidentally released during operations.

TABLE 3-3
DESALINATION CHEMICALS AND ANNUAL USAGE

Chemical	Application	Annual Usage (pounds)
Sodium Hypochlorite	Pretreatment / post-treatment	140,000 / 55,000
Sodium Bisulfite	Pretreated source water	85,000
Carbon Dioxide	Post-treatment	420,000
Lime	Post-treatment	960,000
Sodium Hydroxide	Post-treatment	55,000
Zinc Orthophosphate	Post-treatment	30,000
RO Cleaning Chemicals (various)	RO membrane cleaning	To be determined
Coagulant (if needed)	Pretreatment	To be determined

SOURCE: RBF Consulting, 2013b; CalAm, 2014a.

3.2.2.5 Brine Storage and Disposal

The RO process would generate approximately 14 mgd of brine, including 0.4 mgd of decanted backwash water as noted in Section 3.2.2.1, Pretreatment System. The brine storage and disposal system would consist of an uncovered 3-million-gallon brine storage basin with two impermeable liners; two 6 mgd, 40 hp brine discharge pumps; and a brine aeration system to maintain dissolved oxygen concentrations in the brine at 5 mg/L. When full, the brine storage basin would have a surface area of about 1.25 acres. Brine from the RO system would be conveyed through the 1-mile-long, 36-inch-diameter Brine Discharge Pipeline to a new connection with the existing MRWPCA ocean outfall that discharges into the waters of MBNMS. When temporary storage is needed, brine would be directed to the brine storage basin where it could be stored for up to 6 hours, then pumped to the Brine Discharge Pipeline.

9 As discussed in Section 3.4.2, below, during periods of low demand, desalinated product water could be injected into the Seaside Groundwater Basin for storage. The post-treatment system would be designed to ensure that desalinated product water that is injected into underground storage would not adversely affect groundwater quality.

During some times of the year, brine would be mixed with varying volumes of treated wastewater from the MRWPCA Regional Wastewater Treatment Plant before being discharged through the ocean outfall. During the irrigation season, April through October, the treated wastewater is diverted to the Salinas Valley Reclamation Project's tertiary treatment facility for additional advanced treatment and then used to irrigate crops as part of the Castroville Seawater Intrusion Project (CSIP). During this time period, as long as MRWPCA treated wastewater flows are equal to or less than the CSIP demand for irrigation water, the project's brine stream would be discharged to Monterey Bay without dilution. During the non-irrigation season, November through March, when the CSIP is not operating, the brine stream would at all times be mixed with treated wastewater from the MRWPCA Regional Wastewater Treatment Plant before being discharged to the ocean.

Proper disposal of waste streams requires that the different type of flows be thoroughly mixed prior to discharge to the outfall to prevent stratification in the outfall and to optimize the mixing of the discharge with ocean water. In addition to brine generated by the MPWSP Desalination Plant, the proposed Brine Mixing Box would accept secondary effluent from the MRWPCA Regional Wastewater Treatment Plant, and trucked brine waste collected from individual water softeners and private desalination facilities. The proposed Brine Mixing Box and appurtenances would be located at the southern terminus of the proposed Brine Discharge Pipeline, in a currently undeveloped portion of the MRWPCA property, approximately 0.5 acre in size as shown on Figure 3-5a. The principal components include a diversion structure, piping between the diversion structure and the brine mixing basins, four below-grade mixing basins with mechanical mixers, a laboratory and control building, and a flow meter to measure the total mixed flow returned from the mixing basins to the diversion structure and outfall. Proposed ancillary facilities include a flow bypass system to carry wastewater flows in the outfall during construction of the diversion structure, and to enable future maintenance, a trucked brine station and access road, sampling pumps, a flow bypass system for the brine waste streams in the event the diversion structure is out of service for maintenance, and a fresh water pipeline and appurtenant facilities. The only aboveground components include the laboratory and control building, and a new 22-foot-wide access road (MRWPCA, 2017). A range of possible mixtures of brine and treated wastewater is described in Section 4.3, Surface Water Hydrology and Water Quality.

The existing 2.1-mile-long MRWPCA outfall pipeline ends with a 1,100-foot-long, underwater diffuser that rests on ballast rock. The ports are approximately 6 inches above the ballast rock and nominally 54 inches above the seafloor, although this varies. For the dilution calculations, they are assumed to be 4 feet above the seafloor at approximately 90 to 110 feet below sea level. The diffuser is equipped with 172 ports (129 open and 43 closed), each 2 inches in diameter and spaced 8 feet apart.

3.2.2.6 Administrative Building

A 4,000- to 6,000-square-foot single-story administrative building at the MPWSP Desalination Plant site would house visitor reception, offices, restrooms, locker rooms, break rooms, conference rooms, a control room, a laboratory, an equipment storage and maintenance area, and monitoring and control systems for the RO system, post-treatment system, chemical feed systems, and related facilities.

3.2.3 Desalinated Water Conveyance

Desalinated product water from the MPWSP Desalination Plant would flow south through a series of proposed pipelines (i.e., the new Desalinated Water Pipeline and new Transmission Main), including surface equipment such as valves and blowoffs, to existing CalAm water infrastructure, as described in Sections 3.2.3.3 through 3.4.3.9.

3.2.3.1 Treated Water Storage Tanks

Following post-treatment, desalinated product water would flow to two covered, aboveground tanks. Each tank would be approximately 103 feet in diameter and 35 feet tall, constructed of steel or concrete, and provide 1.75 million gallons of storage, for a total storage volume of 3.5 million gallons.

3.2.3.2 Desalinated Water Pumps

The proposed desalinated water pumps would be located at the multi-purpose pump station described in Section 3.2.2.1, near the center of the MPWSP Desalination Plant. Separate systems would pump desalinated product water to the CalAm water system and to the Salinas Valley. Consistent with the capacity of the MPWSP Desalination Plant, a 9.6 mgd capacity pump system would pump desalinated product water to the CalAm water system. There would be two 4.8 mgd, 600 hp treated water pumps and two 2.4 mgd, 300 hp treated water pumps. Unless the final results of the aquifer pump tests at the existing test slant well dictate otherwise, two 1.4 mgd, 10 hp Salinas Valley return flow pumps would pump desalinated product water (i.e., Salinas Valley return flows) to the Castroville Community Services District (CCSD) and CSIP water distribution systems as described in Sections 3.2.3.6 and 3.2.3.7.

3.2.3.3 New Desalinated Water Pipeline

For conveyance to the CalAm water system, the desalinated water pump station would pump desalinated water through the new Desalinated Water Pipeline and new Transmission Main. From the pump station, the 3.3-mile-long, 36-inch-diameter buried new Desalinated Water Pipeline would extend west for approximately 0.8 mile parallel to the north side of the Charles Benson Road right-of-way. As described above in Section 3.2.1.2, the new Desalinated Water Pipeline would be installed alongside the Source Water Pipeline on the north side of the row of trees and would traverse agricultural land. At Del Monte Boulevard, the new Desalinated Water Pipeline would turn north on Del Monte Boulevard for approximately 800 feet to Lapis Road, and continue south within TAMC right-of-way along Lapis Road for approximately 1.3 mile to another Lapis Road/Del Monte Boulevard intersection. From this intersection of Lapis Road and Del Monte Boulevard, the new Desalinated Water Pipeline would be built under the Monterey Peninsula Recreational Trail and TAMC right-of-way using trenchless construction, then continue south along the west side of the Monterey Peninsula Recreational Trail and TAMC right-of-way for approximately 1.4 mile to Reservation Road (see **Figures 3-4** through **3-7**). For the purposes of this EIR/EIS, south of Reservation Road this pipeline is referred to as the new Transmission Main (see Section 3.2.3.4).

New Desalinated Water Pipeline – Optional Alignment

Similar to the optional alignment for the Source Water Pipeline (see Section 3.2.1.2), the optional alignment for the new Desalinated Water Pipeline would be identical to the alignment described in the paragraph above, except that the 0.8-mile-long segment along Charles Benson Road would be installed within the Charles Benson Road paved right-of-way (as opposed to north of and outside of the right-of-way, along private agricultural lands) (see **Figure 3-4**). Construction activities within Charles Benson Road would be limited to after hours/nighttime construction, to avoid conflicts with the operations of the Waste Management District.

3.2.3.4 New Transmission Main

At Reservation Road, water in the new Desalinated Water Pipeline would enter the 6-mile-long, 36-inch-diameter new Transmission Main and continue south along the west side of the Monterey Peninsula Recreational Trail and TAMC right-of-way. At a point approximately 750 feet north of Highway 1, it would cross east under the Monterey Peninsula Recreational Trail and TAMC right-of-way using trenchless construction and continue south on the west side of Del Monte Boulevard and beneath the Highway 1 overpass where it would follow between the Monterey Peninsula Recreational Trail and TAMC right-of-way for approximately 2 miles. At approximately 1,000 feet north of the Lightfighter Drive overpass, the new Transmission Main would cross under Highway 1 and continue southeast for approximately 1,400 feet, making two turns before reaching the south side of Lightfighter Drive, just east of the intersection of Lightfighter Drive and 1st Avenue. The Highway 1 crossing would require an entry pit at the Monterey Peninsula Recreational Trail and TAMC right-of-way, and an egress pit on the opposite side of Highway 1, between the highway and 1st Avenue. Each of these pits would be approximately 150 feet long by 50 feet wide. The new Transmission Main would continue east along Lightfighter Drive for approximately 0.4 mile to General Jim Moore Boulevard, turn south along the east side of General Jim Moore Boulevard to Normandy Road. South of Normandy Road the pipeline would be located along the west side of General Jim Moore Boulevard for approximately 1.9 miles, ending at the existing Phase I ASR Facilities (see **Figures 3-7** through **3-9a**) where it would connect to CalAm's existing water supply distribution system at the General Jim Moore Boulevard/Coe Avenue intersection.

New Transmission Main – Optional Alignment

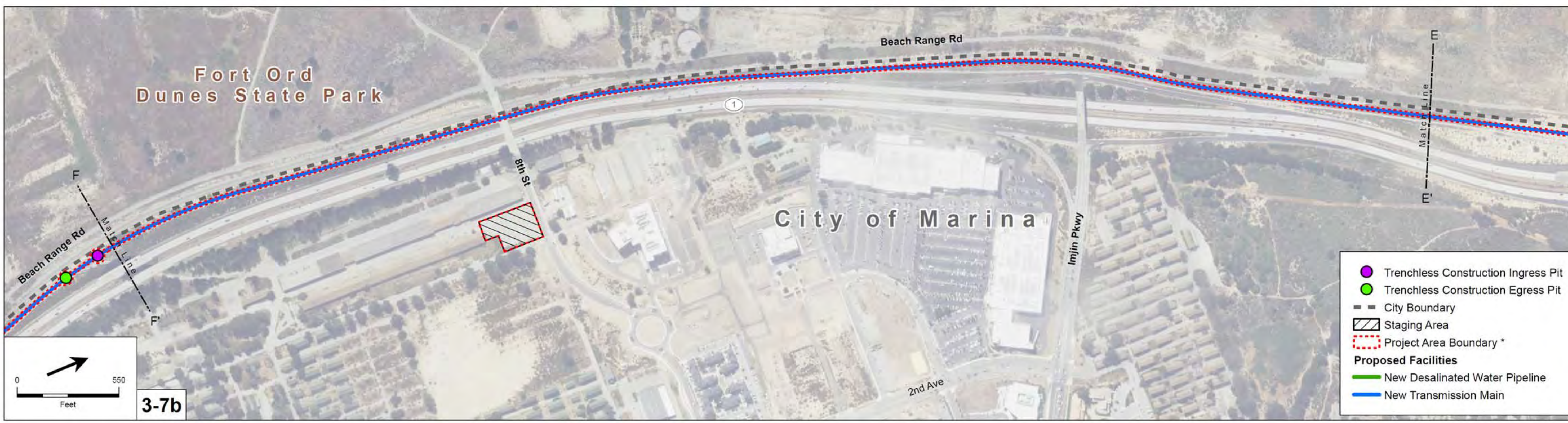
The optional alignment for the new Transmission Main would slightly modify the Highway 1 crossing. Roughly 1,200 feet of the new Transmission Main Optional Alignment would be installed beneath Highway 1 via horizontal directional drilling. The entry pit would be located at the Monterey Peninsula Recreational Trail and TAMC right-of-way, approximately 415 feet north of the Highway 1 and Lightfighter Drive interchange, and an egress pit at the southeast corner of Lightfighter Drive and 1st Avenue (see **Figure 3-8**).

NOTE:
*Project area boundary refers to the area within which all construction related disturbance would occur.

SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

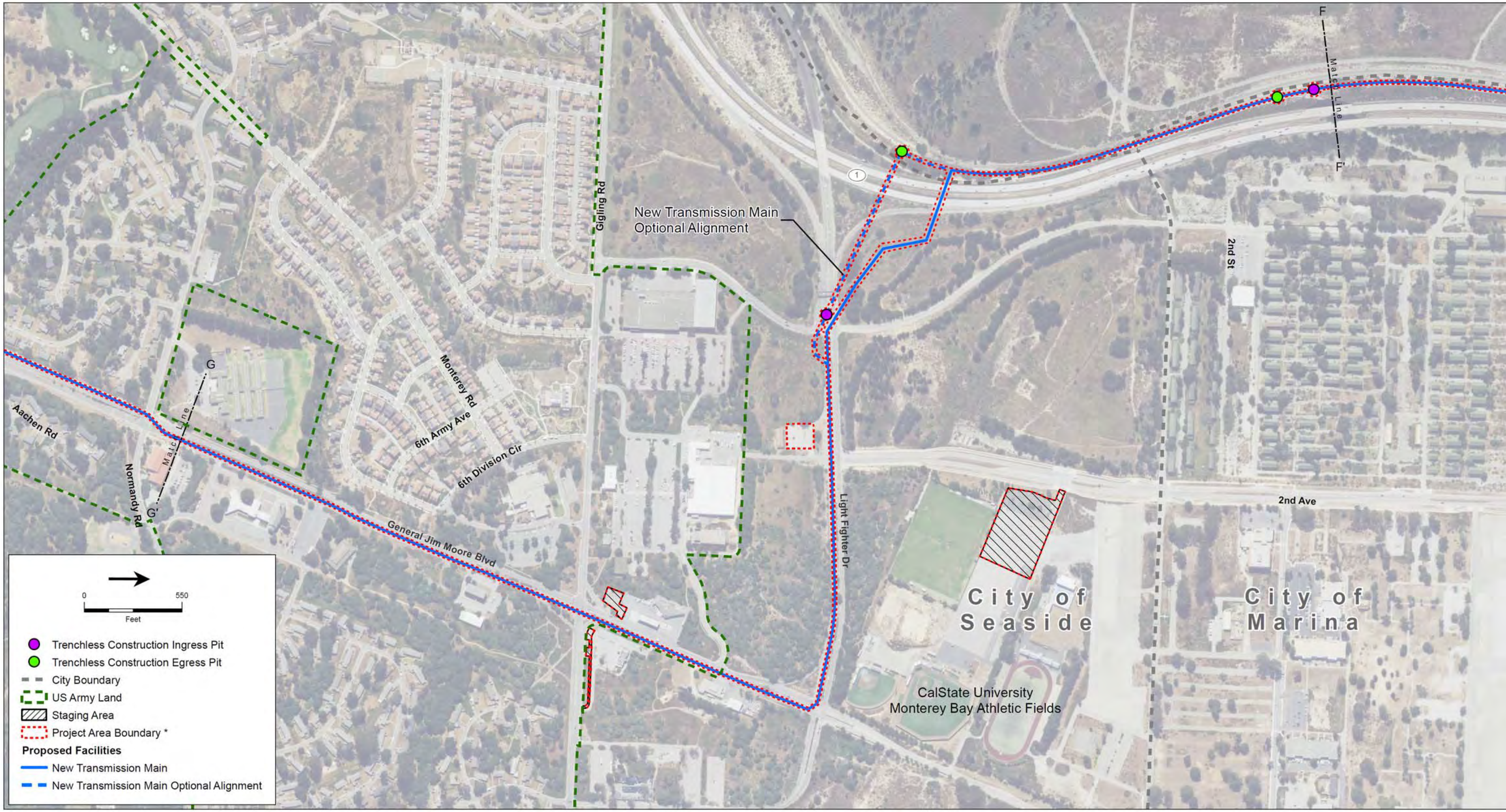
Figure 3-6
New Desalinated Water Pipeline



NOTE:
*Project area boundary refers to the area within which all construction related disturbance would occur.

SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project
Figure 3-7
New Transmission Main - City of Marina

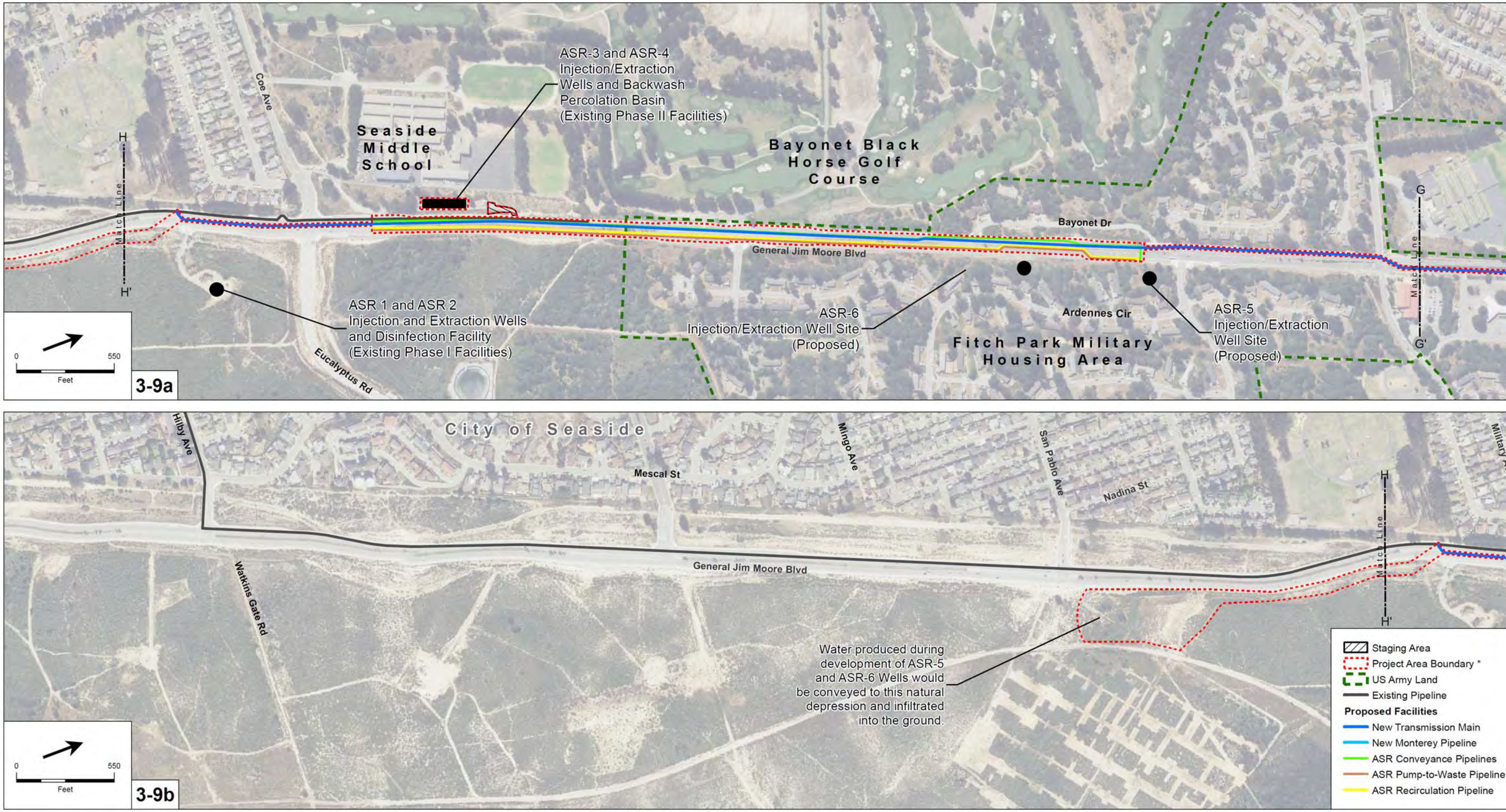


NOTE:
*Project area boundary refers to the area within which all construction related disturbance would occur.

SOURCE: ESA, 2016; US ARMY, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 3-8
New Transmission Main - Light Fighter Drive to General Jim Moore Boulevard



NOTE:
*Project area boundary refers to the area within which all construction related disturbance would occur.

SOURCE: ESA, 2016; US ARMY, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 3-9
ASR Facilities and Terminal Reservoir

3.2.3.5 Carmel Valley Pump Station

The Valley Greens pressure zone, in Carmel Valley south of the Segunda Reservoir, does not have sufficient hydraulic head to fill the existing Segunda Reservoir, which is located at the southern end of the existing Segunda Pipeline. The proposed Carmel Valley Pump Station, with a pumping capacity of 3 mgd (2,100 gpm), would provide the additional pressure needed to fill Segunda Reservoir. The pump station would be enclosed in a 500-square-foot, single-story building on a site located approximately 240 feet south of Carmel Valley Road near the intersection of Rancho San Carlos Road (see **Figure 3-10c**). A 50 kW (68 hp) portable diesel-fuel powered generator would be stored onsite for use in the event of a power outage. A separate 100-square-foot electrical control building would be constructed outside of the pump station building.

3.2.3.6 Castroville Pipeline

The 4.5-mile-long, 12-inch-diameter Castroville Pipeline would convey desalinated Salinas Valley return water from the MPWSP Desalination Plant to the CSIP distribution system and the CCSD Well #3. As described in Chapter 2, Water Demand, Supplies and Water Rights, the portion of the water drawn from the subsurface slant wells that is determined to be groundwater originating from the Salinas Valley Groundwater Basin, would be delivered to CCSD as desalinated water in lieu of CCSD pumping an equivalent amount of groundwater. Under the proposed project, the first 800 afy would go to the CCSD and the remaining water would go to the CSIP.

From the MPWSP Desalination Plant, the Castroville Pipeline would head west along the north side (outside of the paved roadway, through agricultural land) of Charles Benson Road to Del Monte Boulevard, at which point the pipeline would head north. The pipeline would be installed along Del Monte Boulevard to Lapis Road and then along the west side of Lapis Road within the TAMC right-of-way and along Monte Road, and would cross over the Salinas River at Monte Road by being attached to the underside of the Monte Road Bridge. On the north side of the Salinas River bridge, the pipeline would continue northeast along the TAMC right-of-way and Monte Road to Nashua Road. A new pipe connection to the CSIP distribution system would be built at the northern end of Monte Road, where it meets Nashua Road. The Castroville Pipeline would continue north along a dirt agricultural road and the Union Pacific Railroad, crossing under Tembladero Slough to Highway 183 (Salinas Road). From Highway 183, the pipeline would continue north between Del Monte Avenue and Union Pacific Railroad, turn west across Del Monte Avenue and connect to CCSD Well #3 at the north corner of Del Monte Avenue and Merritt Street (see **Figures 3-4**, **3-5**, **3-11**, and **3-12**).

Castroville Pipeline – Optional Alignment 1

Optional Alignment 1 would provide an alternate pipeline route from the intersection of Monte Road and Nashua Road to CCSD Well #3. From the intersection of Monte Road and Nashua Road, Optional Alignment 1 would turn northwest along Nashua Road to the Monterey Peninsula Recreational Trail. It would continue northeast along the Monterey Peninsula Recreational Trail on the east side of Highway 1 for approximately 1.5 mile to Merrit Way and continue southeast on Merritt Street for 0.5 mile to CCSD Well #3 (see **Figures 3-11b**, **3-12**, and **3-13**).

Castroville Pipeline – Optional Alignment 2

Similar to the way it evaluates the optional alignments for the Source Water Pipeline and new Desalinated Water Pipeline in Sections 3.2.1.2 and 3.2.3.3, above, this EIR/EIS also evaluates an alternate route for the 0.8-mile-long segment of the Castroville Pipeline along Charles Benson Road to provide a backup plan in the event that CalAm is unable to secure an easement from the agricultural land owners. Under Optional Alignment 2, the segment along the Charles Benson Road would be installed within the paved Charles Benson Road right-of-way, instead of north of and outside of the paved road right-of-way, on private agricultural land (see **Figure 3-4**). Construction activities within Charles Benson Road would be limited to after hours/nighttime construction, to avoid conflicts with the operations of the Waste Management District.

3.2.3.7 Pipeline to CSIP Pond

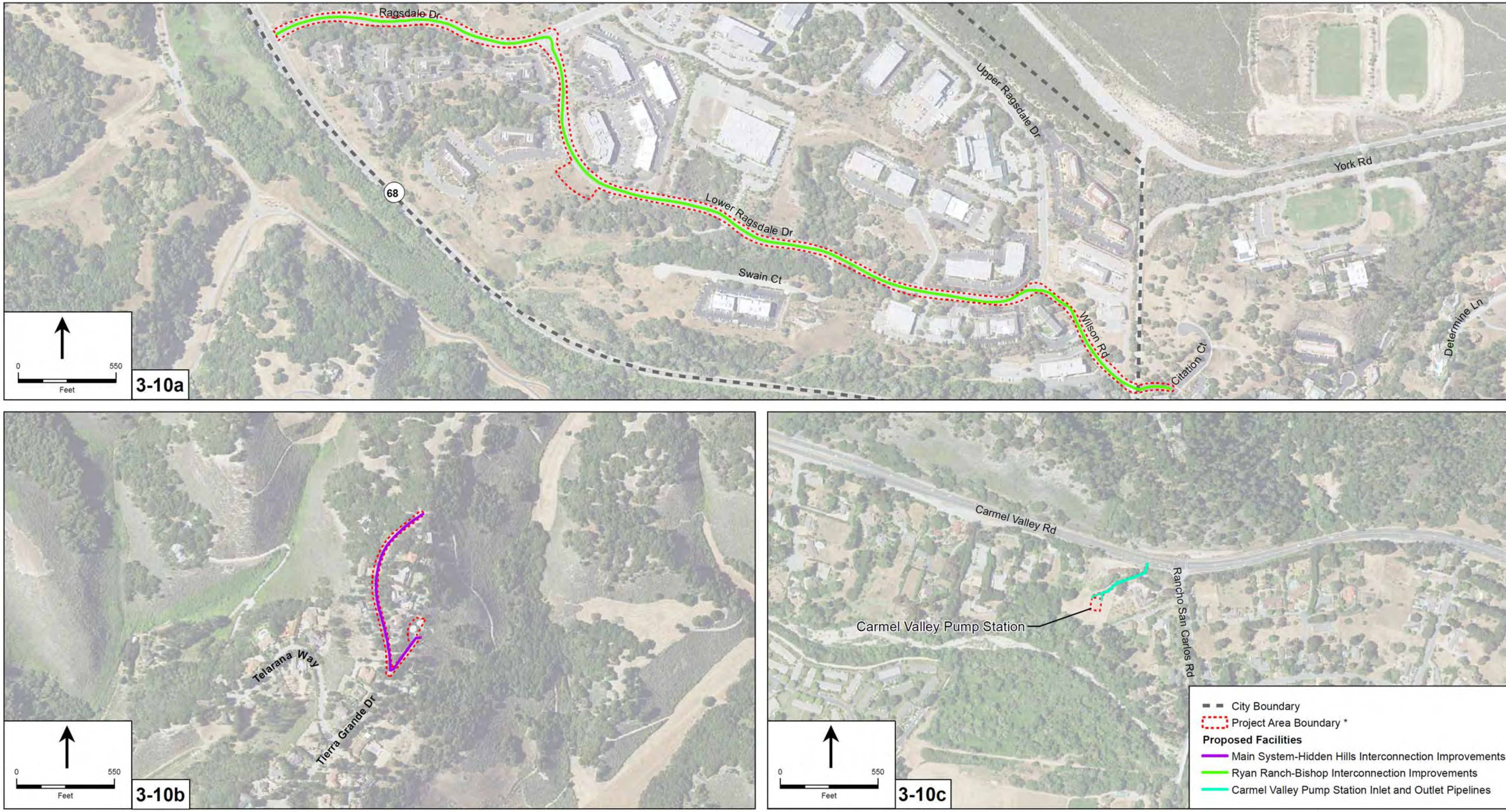
As described in Chapter 2, Water Demand, Supplies and Water Rights, and Section 3.2.3.6 above, the portion of the water drawn from the subsurface slant wells that is determined to be groundwater originating from the Salinas Valley Groundwater Basin, would be delivered to agricultural users in the Salinas Valley Groundwater Basin in lieu of an equal amount of groundwater pumping. The portion of the Salinas Valley return water destined for the CSIP would be delivered via a new connection along the Castroville Pipeline at Nashua Road and Monte Road, this EIR/EIS also evaluates a Pipeline to the CSIP Pond if engineering constraints preclude the new Castroville Pipeline connection. Note that only the return flows to the CSIP pond may have constraints; no issues are anticipated for the connection to the CCSD distribution system. For purposes of CEQA/NEPA environmental review, this analysis conservatively assumes that CalAm would build both the Castroville Pipeline and the Pipeline to CSIP Pond. If CalAm does so, it would pump some of the Salinas Valley return water from the MPWSP Desalination Plant through a new 1.2-mile-long, 12-inch-diameter pipeline to the existing CSIP pond at the southern end of the MRWPCA Regional Wastewater Treatment Plant. The CSIP pond holds 80 af. From the CSIP pond, water would be delivered to agricultural users in the Salinas Valley through existing infrastructure (see **Figures 3-4** and **3-5a**).

3.2.3.8 Interconnections with Highway 68 Satellite Systems

The proposed project would also improve existing interconnections at three satellite water systems in the unincorporated communities of Ryan Ranch, Bishop, and Hidden Hills, which are located along the Highway 68 corridor (see **Figure 3-10**).

Ryan Ranch–Bishop Interconnection Improvements

Project improvements to the interconnection between the main system and the Ryan Ranch and Bishop systems would involve building a 1.1-mile-long, 8-inch-diameter pipeline from an existing interconnection between the main system and Ryan Ranch at Highway 68 and Ragsdale Drive, through the Ryan Ranch community, to a new connection with the Bishop system. The pipeline would be installed within the rights-of-way of Ragsdale Drive, Lower Ragsdale Drive, and Wilson Drive.



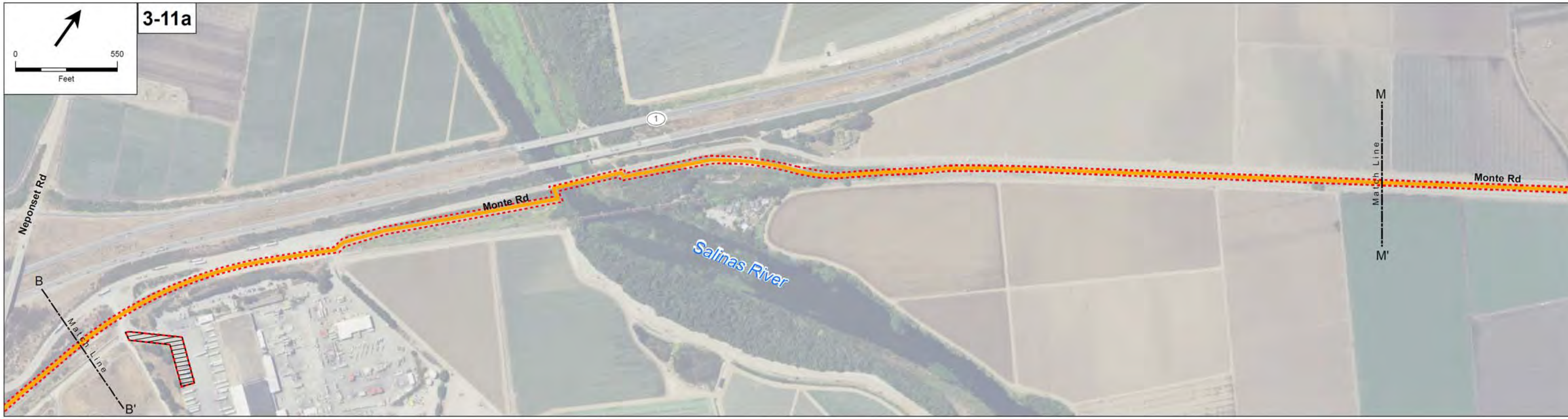
205335.01 Monterey Peninsula Water Supply Project

Figure 3-10

Highway 68 Interconnection Improvements and Carmel Valley Pump Station

NOTE:
*Project area boundary refers to the area within which all construction related disturbance would occur.

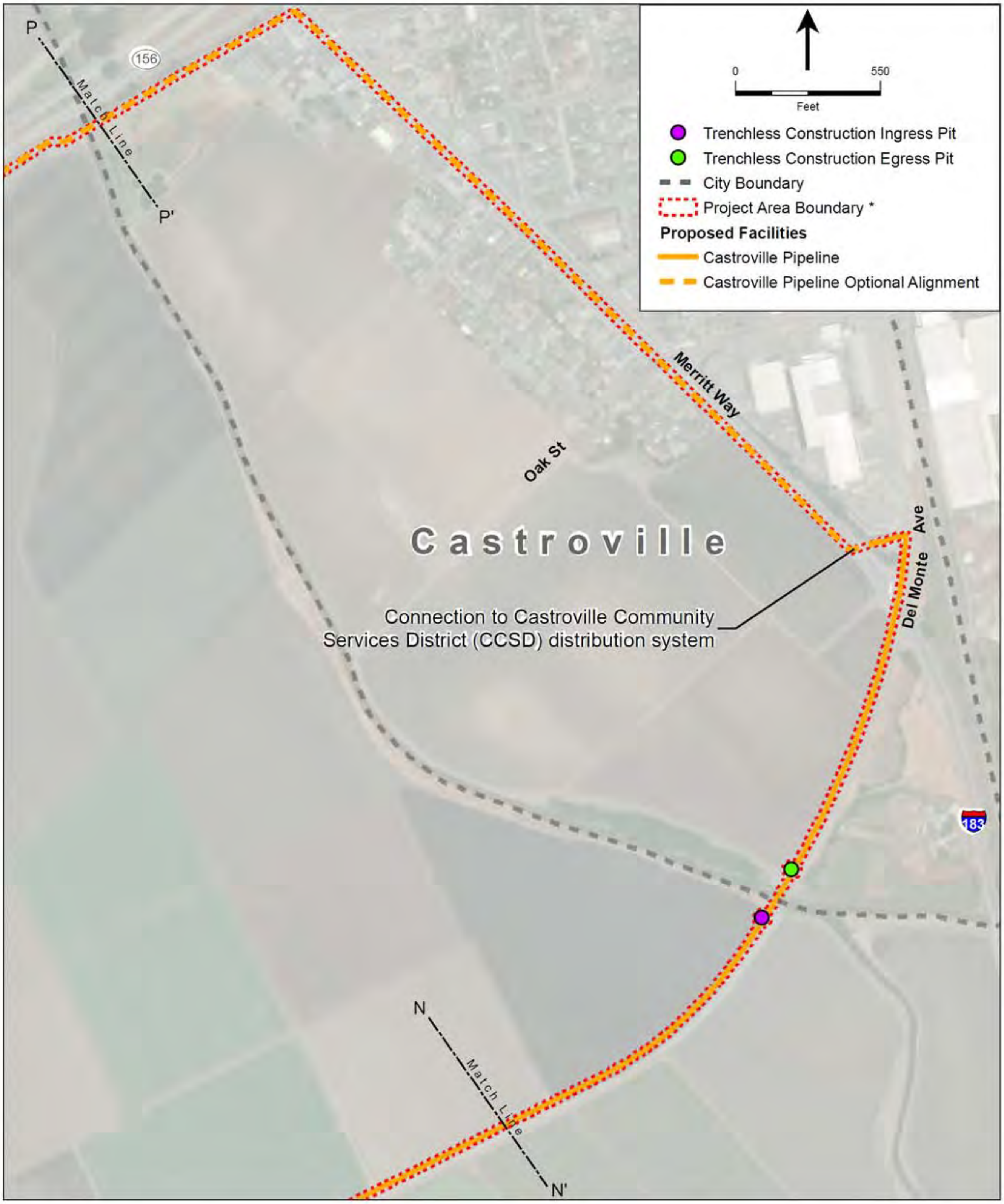
SOURCE: ESA, 2016



NOTE:
*Project area boundary refers to the area within which all construction related disturbance would occur.

SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project
Figure 3-11
Castroville Pipeline



NOTE:
*Project area boundary refers to the area within which all construction related disturbance would occur.

SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 3-12

Castroville Pipeline - Connection to CCSD Distribution System

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SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 3-13

Castroville Pipeline Optional Alignment

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Main System–Hidden Hills Interconnection Improvements

The existing interconnection between the main CalAm distribution system and the Hidden Hills system would be improved by installing approximately 1,200 feet of 6-inch-diameter pipeline along Tierra Grande Drive. In addition, the existing pump capacity of the Middle Tierra Grande Booster Station, located on lower Casiano Drive, would be upgraded from 161 gpm to 400 gpm by adding a new 350 gpm pump (CalAm, 2013a).

3.2.4 Proposed ASR Facilities

As part of the MPWSP, CalAm proposes to expand the existing Seaside Groundwater Basin ASR system to provide additional injection/extraction capacity for both desalinated product water and Carmel River supplies, and to increase system reliability.

ASR is the storage of water in an aquifer during times when water is available, and recovery of the stored water from the same aquifer when it is needed. ASR provides a storage solution for the project, storing water during times of excess Carmel River flow as well as desalinated water in excess of customer demand, and recovering it later to meet peak summer water demands when the excess flow is not available. Water is stored in an existing groundwater aquifer, reducing or eliminating the need to construct large and expensive surface reservoirs. The ASR system comprises water transmission facilities, aquifer storage and recovery facilities including four existing injection/extraction wells (ASR-1 through ASR-4), storage reservoirs, and booster pump stations.

The proposed improvements to the ASR system include adding two injection/extraction wells, ASR-5 and ASR-6 Wells, and adding three parallel 0.9-mile-long ASR pipelines. With the addition of these two wells, the ASR system would consist of a total of six injection/extraction wells. The proposed ASR-5 and ASR-6 Wells would be located along General Jim Moore Boulevard on U.S. Army owned property, currently under lease to Monterey Bay Military Housing (MBMH), north of the Phase I and Phase II ASR facilities in Seaside (see **Figure 3-9**). These improvements would not affect CalAm's maximum allowable surface water diversions from the Carmel River for injection into the groundwater basin.

3.2.4.1 ASR Injection/Extraction Wells (ASR-5 and ASR-6 Wells)

CalAm would build two additional injection/extraction wells (ASR-5 and ASR-6 Wells) on two U.S. Army-owned parcels located east of General Jim Moore Boulevard and south of its intersection with Ardennes Circle, in the Fitch Park MBMH area (see Figure 3-9a). The new injection/extraction wells would be drilled to a depth of approximately 1,000 feet and screened in the Santa Margarita sandstone aquifer. Each well would have a permanent 500 hp multi-stage vertical turbine pump, Supervisory Control and Data Acquisition (commonly called SCADA)[10] controls for remote operation, and various pipes and valves. Each well pump and electrical control system would be housed in a 900-square-foot concrete pump house. A low-voltage, 480-volt, three-

[10] SCADA (Supervisory Control And Data Acquisition) is a system for remote monitoring and operations of water supply facilities.

phase electrical transformer would be installed at each well site to power the electrical control system. Pacific Gas & Electric Company (PG&E), the local electrical utility, would own and operate the electrical transformers. Security fencing would encompass an approximately 0.4- and 0.5-acre area around the ASR-5 and ASR-6 Wells, respectively (RBF Consulting, 2010). One 20-foot-wide access driveway would be constructed within currently undeveloped land between General Jim Moore Boulevard and each of these fenced areas, as shown in **Figure 3-14**.

The existing ASR disinfection system is housed within the chemical/electrical control building at the site of the existing ASR-1 and ASR-2 Wells.[11] The existing disinfection system has sufficient capacity to treat ASR product water extracted from all six ASR injection/extraction wells (i.e., the four Phase I and Phase II wells and the two new wells proposed under the MPWSP). The disinfection system consists of a 5,000-gallon bulk sodium hypochlorite storage tank, chemical metering pumps, and chlorine residual analyzer. The disinfection system includes double containment for all chemical storage and dispensing equipment, protective vent-fume neutralizers, safety showers for operations personnel, and a forced-air ventilation system.

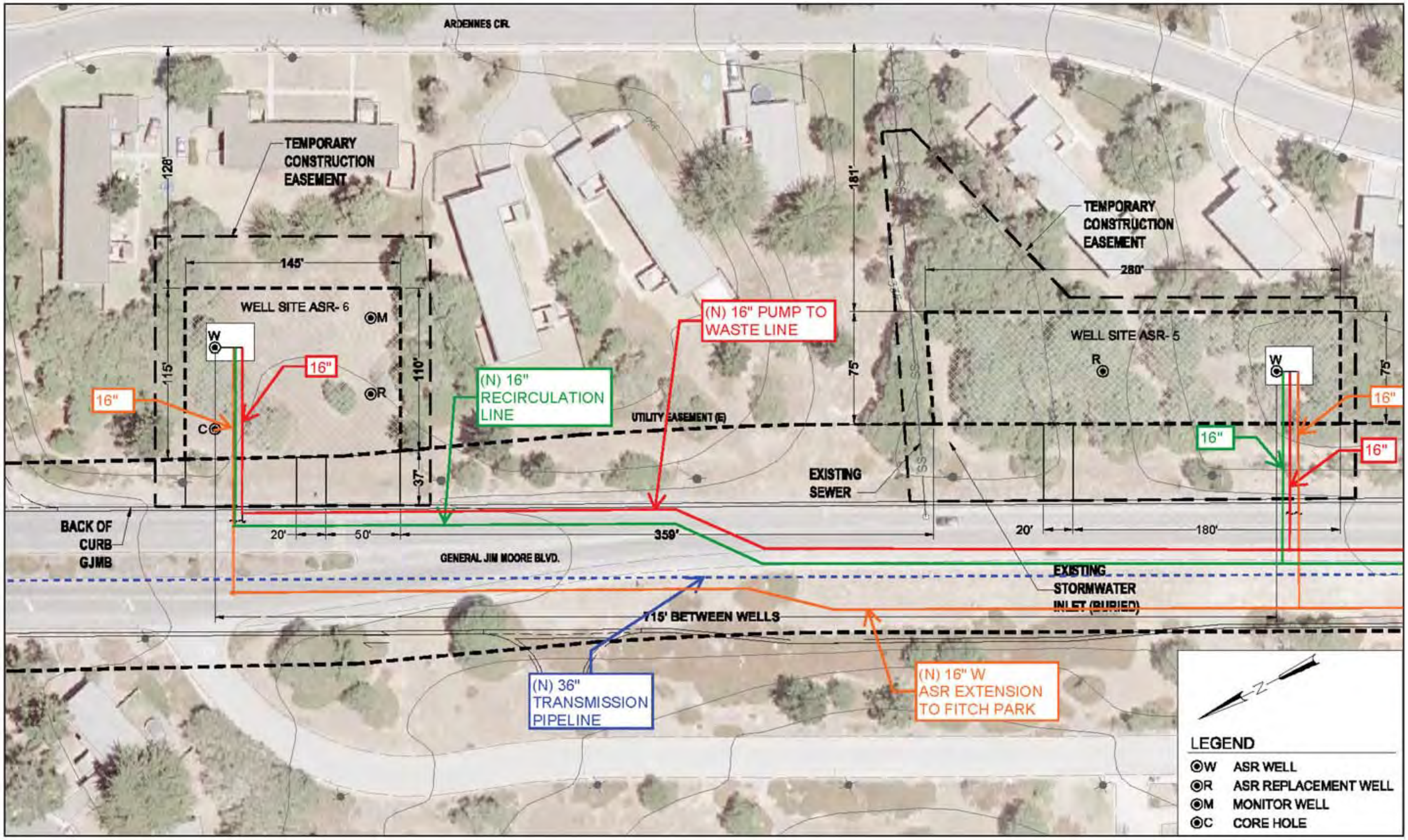
The ASR-5 and ASR-6 Wells would have a combined injection capacity of 4.3 mgd (3,000 gpm) and the same combined extraction capacity (approximately 4.3 mgd). The ASR-5 and ASR-6 Wells would operate in conjunction with the existing ASR-1, ASR-2, ASR-3, and ASR-4 Wells. With implementation of the MPWSP, any of the six ASR injection/extraction wells could be used to inject desalinated product water and Carmel River supplies.

Maintenance of the ASR-5 and ASR-6 Wells would involve routine backflushing of the two wells. Backwash effluent containing elevated levels of sediment and turbidity would be conveyed through the proposed ASR Pump-to-Waste Pipeline (see description below) to the existing settling basin for the Phase I facilities at the intersection of General Jim Moore Boulevard and Coe Avenue, and would infiltrate into the ground. As part of ongoing operations of the ASR system, sediment that accumulates in the settling basin is periodically removed and disposed of at an appropriate disposal site to prevent the settling basin from clogging.

3.2.4.2 ASR Pipelines

Three parallel 0.9-mile-long, 16-inch-diameter ASR pipelines – the ASR Recirculation Pipeline, the ASR Conveyance Pipeline, and the ASR Pump-to-Waste Pipeline – would extend along General Jim Moore Boulevard between the proposed ASR-5 and ASR-6 Wells at the Fitch Park MBMH area and the intersection of Coe Avenue and General Jim Moore Boulevard. The ASR Recirculation Pipeline would convey water between existing conveyance pipelines and infrastructure at Coe Avenue and General Jim Moore Boulevard to the ASR-5 and ASR-6 Wells for injection. The ASR Conveyance Pipeline would convey water that is extracted from the ASR-5 and ASR-6 Wells to the same facilities at the intersection of Coe Ave and General Jim Moore Boulevard. The ASR Pump-to-Waste Pipeline would convey backflush effluent from the

[11] The existing ASR-1 and ASR-2 Wells are also known as Santa Margarita Wells #1 and #2 in other information sources.



SOURCE: RBF Consulting

205335.01 Monterey Peninsula Water Supply Project

Figure 3-14
Site Plan: ASR-5 Well and ASR-6 Well

ASR-5 and ASR-6 Wells to the existing settling basin for the ASR-1 and ASR-2 Wells, which is about 2 miles south of the intersection of General Jim Moore Boulevard and Coe Avenue (see Figure 3-9a). Each of the three 16-inch-diameter ASR pipelines would connect to each of the two new ASR wells; the 36-inch diameter Transmission Main would also connect to each of the two new ASR wells with 16-inch diameter connector pipes (see **Figure 3-14**).

3.2.5 Electrical Power Facilities

Although CalAm may eventually use renewable energy sources to power the MPWSP Desalination Plant (see Section 4.18, Energy Conservation, for a description), this EIR/EIS assumes that all electrical power for the proposed facilities would be provided via new connections to the local PG&E grid. New underground and aboveground power lines would be installed at CEMEX for the subsurface slant wells, at the MPWSP Desalination Plant site, the ASR-5 and ASR-6 Well sites, and Carmel Valley Pump Station to connect the new facilities to the existing power grid.

3.3 Construction

3.3.1 Site Preparation and Construction Staging

3.3.1.1 Site Clearing and Preparation

Construction workers would clear and prepare the construction work areas in stages as construction progresses. Before construction starts, the contractor would clear and grade portions of the project area, removing vegetation and debris, as necessary, to provide a relatively level surface for the movement of construction equipment. After construction, the contractor would contour the construction work areas to their original profile, and hydroseed or pave the areas, as appropriate.

3.3.1.2 Staging Areas

Construction equipment and materials would be stored within the construction work areas to the extent feasible. Construction staging for the subsurface slant wells at CEMEX, the MPWSP Desalination Plant, and the ASR-5 and ASR-6 Wells would be accommodated entirely within the project area boundary shown in **Figures 3-3**, **3-5**, and **3-9a**. For construction of all other facilities and pipelines, construction workers would use nine strategically located staging areas in the project area vicinity. The proposed staging areas are sited with the intent of avoiding sensitive riparian areas or critical habitat for protected species. With the exception of the staging areas at Seaside Middle School and the MRWPCA property, the designated staging areas are primarily paved, gravel, or dirt parking lots located in highly disturbed areas. **Table 3-4** summarizes the staging area locations and current site conditions. The staging areas are shown as hatched polygons in **Figures 3-3** through **3-12**.

TABLE 3-4
CONSTRUCTION STAGING AREAS

Location	Site Description
Monte Road/Neponset Road in unincorporated Monterey County	Paved parking lot (semi-trucks) at Dole Vegetable Processing Plant
MRWPCA Property	In open area to the east of the proposed Brine Mixing Box
Beach Road in Marina	Paved parking lot at Walmart
Highway 1/1st Street in Marina	Gated paved parking lot
2nd Avenue, between Lightfighter Drive and Divarty Street, in Seaside	Paved parking lot at the Cal State University at Monterey Bay Athletic Fields
2nd Avenue/Lightfighter Drive in Seaside	Paved parking lot
West side of General Jim Moore Boulevard, near Gigling Road, in Seaside	Paved parking lot
East side of General Jim Moore Boulevard, near Gigling Road, in Seaside	Paved parking lot
West side of General Jim Moore Boulevard, near Seaside Middle School, in Seaside	Sandy area

Because all of the staging areas are paved, gravel, or dirt, CalAm's contractors would not need to remove trees or vegetation to use the sites for staging. They would not lay gravel in dirt staging areas. Except for heavy machinery that is operated solely to move lighter-duty machinery in and out of the staging area, and for the use of a front-loaded backhoe to load and unload material onto transportation vehicles for delivery to the construction sites, heavy machinery would not be operated at the staging areas. Only motion-sensored nighttime lighting would be installed at staging areas.

3.3.2 Well Drilling and Development and Related Site Improvements

3.3.2.1 Subsurface Slant Wells

Well installation consists of a two-part process: well drilling and well development. Well development occurs after the wells have been drilled, and is the process of optimizing the water quality and flow into the well. Both are described below.

All construction activities associated with the subsurface slant wells would occur several hundred feet inland of the maximum high-tide elevation and in previously disturbed areas. Surface construction activities would occur outside of MBNMS. Slant well construction would take approximately 15 months to complete, and could take place anytime throughout the overall 24-month construction duration for the proposed project. Construction activities associated with installation of the nine additional subsurface slant wells, including staging, materials storage, and stockpiling, would temporarily disturb approximately 9 acres of land (approximately 1 acre of disturbance per slant well) within the project area boundary shown in **Figure 3-3a**. Construction activities would occur 24 hours per day, 7 days per week, with multiple slant wells being built simultaneously. Construction-related trucks and vehicles would access the slant well site via

Del Monte Boulevard, Lapis Road, and existing access roads in the CEMEX active mining area. The construction contractor would use a temporary field office (mobile trailer) in the southern portion of the project area throughout slant well construction activities. The field office and materials receiving and storage would be contained within the 9-acre construction disturbance area.

The proposed slant wells would be built using a dual rotary drilling rig, pipe trailers, portable drilling fluid tanks, Baker tanks (portable holding tanks), haul trucks, flatbed trucks, pumps, and air compressors. The slant wells would be drilled at approximately 14 degrees below horizontal.

Drilling fluids, such as water, bentonite mud, or environmentally inert biodegradable additives, would be used to drill through the first 100 feet or so of the dry dune sands to prevent the sand from locking up the drill bit inside the conductor casing. The bentonite mud used in this initial portion of the borehole would be recirculated into and out of the boring using a mud tank located next to the drill rig. Drill cuttings would be removed from the drilling mud using a shaker table and then the drilling mud would be re-used. Once the drill bit reaches groundwater, the construction contractor would pump out all of the sand-bentonite mud slurry and put it in a storage container for off-site hauling and disposal. The elevation of the groundwater surface will be determined from the existing monitoring wells (MW-1S and MW-3S).

Below the top of the groundwater table, the remaining 900 feet of borehole would be drilled using water already present in the sand and some potable water; no bentonite mud or other additives would be used to drill this portion. The water and sediment mixture generated during the lower portion of slant well drilling and construction would be placed in settling tanks, as necessary, to allow sediment to settle out. The volume of water produced during this drilling phase would be small enough that the construction contractor would dispose of the clarified effluent by percolating it into the ground at the CEMEX retired mining area. Drilling spoils generated during the lower portion of slant well drilling (i.e., not containing bentonite mud or other additives) would be spread within the construction disturbance area and would not require offsite disposal.

The slant wells would be completed using telescoping casing ranging from 22 to 36 inches in diameter and super-duplex 12- to 20-inch diameter stainless steel well screens. A submersible pump would be lowered several hundred feet into each well. To develop the slant wells, each well would be pumped for 2 to 6 weeks during slant well completion and initial well testing. The water pumped from the wells during well development would be discharged to the ocean within the waters of MBNMS via the test slant well discharge pipe and the existing MRWPCA ocean outfall. CalAm would need to obtain permission from the MRWPCA to accept the well development water (a combination of brackish groundwater and seawater) into its outfall during this time, since use of the outfall may be precluded during relocation of the existing beach junction structure (see cumulative Project No. 61 in Table 4.1-2). This well development process would produce a volume of water too great to percolate into the ground at the CEMEX mining area, as compared to the drilling phase described above. Once built, each well would include up to 12-inch-diameter mechanical discharge piping (i.e., flow meter, isolation valve, check valve, pump control valve, air release valve, and pressure gauge). This discharge mechanical piping would be located in a below ground vault (12 feet by 6 feet). The electrical controls would be located in a fiberglass enclosure. The discharge piping would then transition underground via trenching and connect to the buried source water pipeline. The wellheads would be accessible at grade level once completed.

3.3.2.2 ASR Injection/Extraction Wells

Construction activities for new ASR injection/extraction wells would include grading, installation and removal of temporary sound walls; well drilling, installation of pipeline connections to the proposed ASR Conveyance Pipelines along General Jim Moore Boulevard, and installation of electrical equipment and pumps. Construction equipment would include drill rigs, water tanks, pipe trucks, flatbed trucks, and several service vehicles. The new ASR injection/extraction wells would be drilled using the reverse rotary drilling method. Bentonite drilling fluids would not be used during well drilling, but non-corrosive, environmentally inert, biodegradable additives might be used to keep the borehole open if necessary. Construction of the ASR-5 and ASR-6 Wells and associated facilities would take approximately 12 months. Most construction activities would extend from 7 a.m. to 7 p.m., 5 days per week, with the exception of 4 weeks of 24-hour construction for each new ASR injection/extraction well during well development and completion (total of 8 weeks of 24-hour construction), until final depth is reached and the borehole is stabilized. This would prevent the borehole from potentially collapsing in on itself, filling the borehole with the surrounding geologic materials, and/or binding up the drill bit and trapping it in the borehole.

Water produced during development of the ASR-5 and ASR-6 Wells at the Fitch Park MBMH housing area would be conveyed to a 1.4-acre natural depression located east of the intersection of San Pablo Avenue and General Jim Moore Boulevard via the pump to waste pipeline and percolated into the ground. The well development water would be disposed of in accordance with Central Coast Regional Water Quality Control Board (RWQCB) Resolution No. R3-2008-0010, General Waiver for Specific Types of Discharges (RWQCB, 2008). Any waste material generated during construction of the proposed ASR facilities that requires off-site disposal would be transported to an approved landfill facility.

3.3.3 Desalination Plant Construction

Construction workers would access the MPWSP Desalination Plant site via Charles Benson Road and existing access roads. Construction activities would include cutting, laying, and welding pipelines and pipe connections; pouring concrete footings for foundations, tanks, and other support equipment; building walls and roofs; assembling and installing major desalination process components; installing piping, pumps, storage tanks, and electrical equipment; testing and commissioning facilities; and finish work such as paving, landscaping, and fencing the perimeter of the site. Construction equipment would include excavators, backhoes, graders, pavers, rollers, bulldozers, concrete trucks, flatbed trucks, boom trucks, cranes, forklifts, welding equipment, dump trucks, air compressors, and generators. Pretreatment, RO, and post-treatment facilities would be prefabricated and delivered to the site for installation. Approximately 25 acres of the 46-acre site would be disturbed during construction (see **Figure 3-5**). No import or export of fill material would be necessary. Construction activities at the desalination plant site are expected to occur over 24 months.

3.3.4 Pipeline Installation

Approximately 21 miles of pipelines would be installed within the paved roadway or adjacent to roads and the Monterey Peninsula Recreational Trail. Most pipeline segments would be installed using conventional open-trench technology; however, where it is not feasible or desirable to perform open-cut trenching, trenchless methods would be used.

Typical construction equipment for pipeline installation would include flatbed trucks, backhoes, excavators, pipe cutting and welding equipment, haul trucks for spoils transport, trucks for materials delivery, compaction equipment, Baker tanks, pickup trucks, arch welding machines, generators, air compressors, cranes, drill rigs, and skip loaders. Pipeline segments would typically be delivered and installed in 6- to 40-foot-long sections. Soil removed from trenches and pits would be stockpiled and reused, to the extent feasible, or hauled away for offsite disposal. Under typical circumstances, the width of the disturbance corridor for pipeline construction would vary from 50 to 100 feet, depending on the size of the pipe being installed. Trenchless technologies could require wider corridors at entry and exit pits. Multiple pipelines would be built simultaneously. Although most pipeline construction would occur over a 15-month period, pipeline construction could occur any time throughout the entire 24-month construction period. As shown in **Table 3-5**, the construction durations for most individual pipelines would be much shorter than 15 months. Pipeline installation would be sequenced to minimize land use disturbance and traffic disruption to the extent possible.

3.3.4.1 Open-Trench Construction

For pipeline segments to be installed using open-trench methods, the construction sequence would typically include:

- clearing and grading the ground surface along the pipeline alignments;
- excavating the trench;
- preparing and installing pipeline sections;
- installing vaults, manhole risers, manifolds, and other pipeline components;
- backfilling the trench with non-expansive fills;
- restoring preconstruction contours; and
- revegetating or paving the pipeline alignments, as appropriate.

A conventional backhoe, excavator, or other mechanized equipment would be used to excavate trenches. The typical trench width would be 6 feet; however, vaults, manhole risers, and other pipeline components could require wider excavations. Work crews would install trench boxes or shoring or would lay back and bench the slopes to stabilize the pipeline trenches and prevent the walls from collapsing during construction. After excavating the trenches, the contractor would line the trench with pipe bedding; that is, sand or other appropriate material shaped to support the pipeline. Construction workers would then place pipe sections (and pipeline components, where applicable) into the trench, weld the sections together as trenching proceeded, and then backfill the trench. Most pipeline segments would have 8 feet of cover. Open-trench construction would generally proceed at a rate of about 150 to 250 feet per day. Steel plates would be placed over trenches to maintain access to private driveways. Some pipeline installation would require construction in existing roadways and could result in temporary lane closures or detours.

TABLE 3-5
CONSTRUCTION ASSUMPTIONS FOR THE PROPOSED PROJECT

Project Component(s)	Total Excess Spoils and Construction Debris (cubic yards)	Construction Equipment	Construction Durations and Work Hours
Subsurface Slant Wells (drilling and development of nine permanent wells, conversion of test slant well to permanent well, and construction of supporting infrastructure in the CEMEX active mining area)	100 cy	• Drilling rig • Pipe trailers • Portable drilling fluid tanks • Flatbed trucks • Haul trucks • Baker tank(s) • Cranes • Air compressors • Pipe cutting and welding equipment	Construction of the nine permanent slant wells and associated facilities could occur anytime during the 24-month construction duration but would take approximately 15 months total. Slant well construction would require 24-hour construction activities.
MPWSP Desalination Plant	0 cy	• Excavators • Backhoes • Air compressors • Loaders • Boom trucks • Cranes • Pavers and rollers • Bulldozers • Concrete transport trucks • Concrete pump trucks • Flatbed trucks • Generators • Pickup trucks • Trucks for materials delivery	The MPWSP Desalination Plant would be constructed over a 24-month period, and would require 24-hour construction activities.
Pipelines: a) Source Water Pipeline b) New Desalinated Water Pipeline and new Transmission Main c) Castroville Pipeline d) Pipeline to CSIP Pond e) Brine Discharge Pipeline and Brine Mixing Box and appurtenances f) ASR Pipelines	a) 1,735 cy b) 15,400 cy c) 600 cy d) 785 cy e) 3,575 cy f) 4,540 cy Total for all pipelines = 24,135 cy	• Flatbed trucks • Backhoes • Excavators • Pipe cutting and welding equipment • Haul trucks for spoils transport • Trucks for materials delivery • Compaction equipment • Baker tank(s) • Pickup trucks • Arc welding machine • Generators • Air compressors • 80-ton crane • Skip loader • Pavers and rollers	Multiple pipelines, sometimes in the same roadway, would be built simultaneously. To the extent feasible, pipeline installation and associated construction activities would occur during the day. This EIR/EIS assumes that the installation of the Transmission Main and three ASR pipelines within the General Jim Moore Boulevard road right-of-way would occur during the day. At other locations, pipeline installation may require nighttime construction to meet the project schedule. Pipeline installation would occur at a rate of approximately 150 to 250 feet per day. The expected construction duration for each pipeline is as follows: a) Source Water Pipeline – 6 months b) New Desalinated Water Pipeline and new Transmission Main – 15 months c) Castroville Pipeline – 4 months d) Pipeline to CSIP Pond – 2 months e) Brine Discharge Pipeline and Brine Mixing Box and appurtenances – 3 months, and 9 months, respectively f) ASR Pipelines – 5 months

TABLE 3-5 (Continued)
CONSTRUCTION ASSUMPTIONS FOR THE PROPOSED PROJECT

Project Component(s)	Total Excess Spoils and Construction Debris (cubic yards)	Construction Equipment		Construction Durations and Work Hours
ASR Injection/Extraction Wells (ASR-5 and ASR-6 Wells)	280 cy	• Drill rig • Boom truck or crane • Backhoe • Air compressor • Electrical generator • Baker tank	• Excavator • Concrete pumper, concrete truck • Paving equipment • Flatbed trucks • Haul trucks • Welding equipment	Construction of the ASR-5 and ASR-6 Wells at Fitch Park MBMH area would take approximately 12 months. With the exception of 4 weeks of 24-hour construction for each new ASR injection/extraction well during well development and completion (total of 8 weeks of 24-hour construction), construction of these facilities would occur during the day.
Highway 68 Interconnection Improvements a) Ryan Ranch–Bishop b) Main System–Hidden Hills	a) 295 cy b) 100 cy	• Flatbed trucks • Backhoes • Excavators • Pipe cutting and welding equipment • Haul trucks for spoils transport • Trucks for materials delivery • Compaction equipment	• Baker tank(s) • Pickup trucks • Arc welding machine • Generators • Air compressors • 80-ton crane • Drill rig • Skip loader • Pavers and rollers	Construction of these facilities would occur during the day. a) Ryan Ranch–Bishop Interconnection Improvements – 4 months b) Main System–Hidden Hills Interconnection Improvements – 3 months
Carmel Valley Pump Station	200 cy	• Excavator • Backhoe • Air compressor • Boom truck or small crane • Generator	• Concrete pump truck • Paving equipment • Flatbed truck • Pavers and rollers • Welding equipment • Baker tank	The Carmel Valley Pump Station would be built over a 6-month period. Construction at this site would occur during the day.
Total Excess Spoils and Construction Debris =	**Approximately 27,610 cy**			**Overall Construction Schedule =** **July 2018 through June 2020 (24 months total)**

3.3.4.2 Trenchless Technologies

Where it is not feasible or desirable to perform open-cut trenching, workers would use trenchless methods such as jack-and-bore, drill-and-burst, horizontal directional drilling, or microtunneling. Pipeline segments located within heavily congested underground utility areas or in sensitive habitat areas would likely be installed using horizontal directional drilling or microtunneling. Jack-and-bore methods would likely be used beneath railroad crossings. Horizontal directional drilling would likely be used for pipeline segments that cross beneath Highway 1 (new Transmission Main) and beneath drainages (Castroville Pipeline). Trenchless methods of pipeline installation would be required at five identified locations (additional locations may be identified during final pipeline design):

1. Installation of the Source Water Pipeline beneath the TAMC right-of-way at Lapis Road, just north of the CEMEX access Road
2. Installation of the new Desalinated Water Pipeline beneath the TAMC right-of-way near the southern intersection of Lapis Road/Del Monte Boulevard
3. Installation of the new Transmission Main beneath the TAMC right-of-way near Marina Drive/Del Monte Boulevard/Reindollar Avenue
4. Installation of the new Transmission Main (and new Transmission Main Optional Alignment) at Highway 1 and Lightfighter Drive
5. Installation of the Castroville Pipeline under Tembladero Slough

Jack-and-Bore and Microtunneling Methods

The jack-and-bore and microtunneling methods entail excavating an entry pit and a egress pit at either end of the pipe segment. A horizontal auger is used to drill a hole, and a hydraulic jack is used to push a casing through the hole to the egress pit. As the boring proceeds, a steel casing is jacked into the hole and pipe is installed in the casing.

Drill-and-Burst Method

The drill-and-burst method involves drilling a small pilot hole at the desired depth through a substrate, and then pulling increasingly larger reamers through the pilot hole until the hole reaches the desired diameter.

Horizontal Directional Drilling

Horizontal directional drilling requires the excavation of a pit on either end of the pipe alignment. A surface-launched drilling rig is used to drill a small horizontal boring at the desired depth between the two pits. The boring is filled with drilling fluid and enlarged by a back reamer or hole opener to the required diameter. The pipeline is then pulled into position through the boring. Entry and receiving pits range in size depending on the length of the crossing, but typically have dimensions of approximately 50 by 50 feet.

3.3.4.3 Disinfection of Existing and Newly Installed Pipelines

Before connecting existing and new pipelines, CalAm would drain and disinfect the existing pipe segments before putting them into service. Similarly, upon completing construction activities, facility operators would disinfect the newly installed pipelines and pipeline connections before bringing the pipes into service. Effluent produced during the pipeline disinfection process would be discharged to the local stormwater drainage system in accordance with the Central Coast RWQCB *General Waste Discharge Requirements for Discharges with Low Threat to Water Quality* (Order No. R3-2011-0223, NPDES Permit No. CAG993001) (RWQCB, 2011), or discharged in compliance with stormwater control requirements in the respective local jurisdictions (e.g., as directed by U.S. Army approvals on Army-owned property). See Impact 4.3-3 in Section 4.3, Surface Water Hydrology and Water Quality, for additional information.

3.3.5 Carmel Valley Pump Station

Construction crews would prepare the Carmel Valley Pump Station site by removing vegetation and grading the sites to create a level work area. Construction activities would include pouring concrete footing for foundations; assembling and installing piping, pumps, and electrical equipment; building concrete enclosures and roofs; and performing finish work such as paving, landscaping, and fencing the perimeter of the pump station site. Construction access would be provided via existing access roads and roadways. Construction of the Carmel Valley Pump Station would result in approximately 40,000 square feet (or 0.9 acre) of temporary disturbance, and 1,300 square feet (0.03 acre) of permanent disturbance.

3.3.6 Installation of Powerlines

New underground and aboveground powerlines would be built between existing powerlines in the area and the proposed facilities. For installation of overhead powerlines, power poles would be sited approximately 300 feet apart. Installation of overhead powerlines would occur in two phases: (1) installing the poles, and (2) installing and tensioning the powerline. Access to each pole would be needed at least twice. The poles would probably be set by digging a hole up to 10 feet deep, placing the pole in the hole, and backfilling. At each of the pole locations, an approximately 50-by-50-foot area would be needed for laydown and assembly, and a limited amount of vegetation might require removal, but grading would not be needed. Construction workers would use standard rubber-tired line trucks to access the alignment and to install and tension the new overhead powerlines. The puller/tensioner would be mounted on a utility truck or on a double-axle trailer. Workers might need to trim or remove some vegetation along the alignment to keep vegetation away from the overhead powerlines.

Installation of the new underground powerlines would require excavation of an approximately 1-foot-wide, 3-foot-deep trench along their alignments. After installing each underground powerline in the trench, construction workers would backfill the trench and restore the ground surface.

3.3.7 Spoils Management and Disposal

Excavation and construction activities would generate excess soil, rock, and construction material and debris. Although suitable topsoil and subsoils excavated during construction would be used to backfill excavations and restore work areas, project construction is projected to generate approximately 27,610 cubic yards of excess material requiring offsite disposal at the Monterey Peninsula Landfill and Monterey Materials Recycling Facility. The average capacity of haul trucks is assumed to be 10 cubic yards. Spoils hauling and placement would occur throughout the 24-month construction schedule.

3.3.8 Construction Schedule

The proposed project facilities would be built over approximately 24 months, with an expected construction period of July 2019 through June 2021. Construction activities associated with installation of the nine permanent subsurface slant wells and conversion of the test slant well into a permanent well at the CEMEX retired mining area would occur over approximately 15 months. Construction activities for the slant wells could occur 24 hours per day, 7 days per week, except for holidays.

Construction activities at the MPWSP Desalination Plant site would take place over 24 months, and could occur up to 24 hours per day, 7 days per week.

Installation of pipelines and construction of the associated conveyance facilities would occur over 15 to 18 months, with multiple pipelines being installed simultaneously. If possible, the pipeline will be installed during the day and within noise ordinance time limits. However, some pipelines or sections of pipeline could require nighttime construction to meet the schedule. Installation of pipelines within the city of Seaside, including all or portions of the three ASR pipelines (ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline) and the sections of the new Transmission Main would occur only during the day. All pipeline components installed within property owned by the U.S. Army (pipelines connected to ASR-5 and ASR-6 Wells) would be constructed only during the day.

Construction of the ASR-5 and ASR-6 Wells would take approximately 12 months. Except for the ASR-5 and ASR-6 Wells, everything else being built at the Fitch Park MBMH in the former Fort Ord area would be built during the day. Each ASR injection/extraction well would require continuous 24-hour construction for up to 4 weeks during well completion and development, for a total of 8 weeks of 24-hour construction.

Construction of the Ryan Ranch–Bishop Interconnection Improvements and Main System–Hidden Hills Interconnection Improvements would take approximately 3 and 4 months, respectively.

Construction of the Carmel Valley Pump Station would take approximately 6 months, and would occur during the day.

3.4 Operations and Maintenance

3.4.1 Operation of the Seawater Intake System, MPWSP Desalination Plant, and Brine Discharges

CalAm would operate the subsurface slant wells and MPWSP Desalination Plant 24 hours a day, 365 days per year. It would usually operate the seawater intake wells remotely using SCADA systems. Up to eight subsurface slant wells would run at any given time, with each well producing approximately 3 mgd of source water for the MPWSP Desalination Plant, for a combined total of up to 24.1 mgd of source water. At least two wells would stay on standby. Approximately 25 to 30 facility operators and support personnel would be on site 24 hours a day to operate the desalination facilities.

The MPWSP Desalination Plant would operate at an overall recovery rate of 42 percent. Approximately 24.1 mgd of raw seawater would be needed to produce 9.6 mgd of desalinated product water. The RO process would generate approximately 13.98 mgd of brine (including 0.4 mgd of decanted waste effluent). The salinity of the brine is expected to range between 57 and 58 ppt,[12] which is roughly 71 to 74 percent higher than seawater (Flow Science Inc., 2014). The brine stream would be discharged to Monterey Bay via the existing MRWPCA ocean outfall and diffuser. During wet periods, the brine stream would be blended with treated wastewater effluent from the MRWPCA Regional Wastewater Treatment Plant before discharge. The brine stream could be discharged without dilution for extended periods during dry months when all of the treated wastewater effluent is reclaimed for agricultural irrigation. The amount of treated wastewater effluent available for blending would vary throughout the year.

The MRWPCA's diffuser would disperse the brine stream at the discharge point, thereby minimizing salinity differences between the discharges and the surrounding seawater. Sections 4.3, Surface Water Hydrology and Water Quality, and 4.5, Marine Resources, describe the modeling and analysis performed for brine discharges under the proposed project.

Table 3-6 provides an overview of typical facility operations under the proposed project.

TABLE 3-6
OVERVIEW OF TYPICAL FACILITY OPERATIONS FOR THE PROPOSED PROJECT

	Operations Schedules
Subsurface Intake System and MPWSP Desalination Plant	24 hours a day, 365 days per year
Conveyance of Salinas Valley Return Flows to CCSD and CSIP	Dry season (typically May through November)
ASR – Injection of Desalinated Product Water	Wet season (typically November through April)
ASR – Injection of Carmel River Supplies	Wet season (typically December through May)
ASR – Extraction	Typically May through November

SOURCE: RBF Consulting, 2013a.

[12] Based on ocean ambient salinity levels ranging from 33.36 to 33.8 ppt (Flow Science, Inc., 2014).

Over the life of the project, for a host of reasons (e.g., mechanical or electrical problems, water quality issues[13], loss of power, etc.), there would be periods when CalAm would need to shut down the MPWSP Desalination Plant. After a shutdown, CalAm might operate the plant with all RO modules in service (at the plant's maximum production capacity of 11.2 mgd) to catch up on production; however, the total annual production would not exceed 9.6 mgd (Svindland, 2014).

Table 3-7 provides a comparative example of MPWSP Desalination Plant typical daily versus operations following a 2-day shutdown. As shown in the example, any fluctuations in daily production would not affect total monthly production.

TABLE 3-7
MPWSP DESALINATION PLANT OPERATIONS –
NORMAL OPERATIONS VS. RECOVERY POST 2-DAY SHUTDOWN

Week	Daily Production (mgd)						
	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Normal Operations							
1	9.6	9.6	9.6	9.6	9.6	9.6	9.6
2	9.6	9.6	9.6	9.6	9.6	9.6	9.6
3	9.6	9.6	9.6	9.6	9.6	9.6	9.6
4	9.6	9.6	9.6	9.6	9.6	9.6	9.6
						Total Monthly Production =	**269 mgd**
Operations Before and After 2-Day Shutdown							
1	9.6	9.6	9.6	9.6	9.6	9.6	9.6
2	9.6	****2-Day Shutdown****		11.2	11.2	11.2	11.2
3	11.2	11.2	11.2	11.2	11.2	11.2	11.2
4	9.6	9.6	9.6	9.6	9.6	9.6	9.6
						Total Monthly Production =	**267 mgd**

SOURCE: Svindland, 2014.

The slant wells would require maintenance every 5 years. During maintenance, workers would access the well from the wellhead, and would lower mechanical brushes into the wells to clean the screens. If chemical cleaning products are needed for maintenance, only environmentally inert products would be used. The disturbance area associated with periodic maintenance of the subsurface slant wells would be roughly 6 acres. All disturbance would occur on the inland side of the dune face at the wellheads.

Accounting for all of the slant wells, maintenance activities within the beach area would last between 9 and 18 weeks every 5 years. Maintenance activities would occur between October and February to avoid the nesting season for snowy plover. Maintenance workers would access the slant wells via the existing CEMEX access road (RBF Consulting, 2013a).

13 Hazardous Algal Blooms would not be a reason for the wells to stop operating. Subsurface intakes are not affected by algal blooms.

3.4.2 Operation of the ASR System

Carmel River supplies would be injected into the groundwater basin via ASR under the MPWMD's and CalAm's existing SWRCB Permits 20808A and 20808C. The instantaneous rate and cumulative quantity of water diverted from the Carmel River and placed into underground storage would be measured and recorded, as would the cumulative quantity of Carmel River water recovered from underground storage and placed into beneficial use.

Unlike the injection period for Carmel River supplies, which is limited to periods of high flow between December and May in the lower stretches of the Carmel River, desalinated product water supplies could be injected into the Seaside Groundwater Basin during any time of the year. Desalinated product water and Carmel River supplies would typically be pumped out of the basin during summer months and periods of peak demand.

Similar to existing operations, CalAm proposes to use the ASR system to store water supplies during wet periods. Both desalinated product water and Carmel River supplies would be chlorinated to drinking water standards at existing CalAm treatment facilities prior to injection. Desalinated product water would flow through the new Desalinated Water Pipeline and the new Transmission Main, while Carmel River supplies would be conveyed through the existing Segunda Pipeline, and injected into the northern subbasin of the Seaside Groundwater Basin (see Section 4.4, Groundwater Resources, for descriptions of groundwater basins and subbasins in the project area).

CalAm would rely primarily on any of the six ASR injection/extraction wells (Phases I, II, and III of the ASR system) to recover the banked water. Depending on demand, CalAm would also use existing groundwater production wells in the Seaside Groundwater Basin to recover the banked water. This would increase operational flexibility. CalAm would extract the water via existing production wells under the following conditions to avoid changing the hydraulic gradient or exacerbating localized depressions:

- Seaside Groundwater Basin annual monitoring reports prepared by Seaside Groundwater Basin Watermaster would be reviewed yearly to identify the current location of the groundwater depression in the Santa Margarita Formation, the aquifer unit where the ASR system water would be banked.
- CalAm's use of existing groundwater production wells to recover water stored in the ASR system would be limited to those production wells in the northern subbasin located east of the center point of the groundwater depression. Restricting extraction to the eastern side of the groundwater depression would allow CalAm to extract the banked water before it migrates into the depression and would, therefore, avoid affecting the groundwater depression.
- The order in which the groundwater production wells would be used to extract banked water depends on how close they are to the ASR injection wells. The first priority would be any of the ASR wells, followed in order by the Paralta, Ord Grove #2, Luzern #2, and Playa #3 Wells.[14]

[14] Based on the current location of the groundwater depression in 2012, and until the depression migrates to the west, the Playa #3 Well may not be used to recover water banked in the ASR system.

- Existing groundwater production wells located outside of the northern subbasin of the Seaside Groundwater Basin (Plumas #4 Well) would not be used to recover banked water because these wells are not directly connected to the aquifer where the ASR water would be stored (CalAm, 2014b).

The stored water would be pumped out of the groundwater basin and conveyed through the ASR Conveyance Pipeline to the CalAm distribution system for direct delivery to customers in Seaside and other customers in CalAm's Monterey District service area. CalAm would meet drinking water requirements by disinfecting this water before serving it to customers.

Tanker trucks would deliver sodium hypochlorite solution (12.5 percent NaOCl) to the existing ASR disinfection facility about once each month to replenish the system. With all six wells in operation, the expected chemical use would be less than 150 gallons per day of sodium hypochlorite. The ASR system would be operated remotely via SCADA.

Similar to operations for the existing ASR injection/extraction wells, facility operators would regularly backflush accumulated sediment and turbid water from the ASR-5 and ASR-6 Wells. This would take anywhere from a few minutes to 2 hours. CalAm would route the water produced during routine backflushing to the existing ASR settling basin at the ASR-1 and ASR-2 Wells site, near the intersection of General Jim Moore Boulevard and Coe Avenue.

3.4.3 Desalinated Water Conveyance Facilities

3.4.3.1 Routine Maintenance of Pump Stations and Pipelines

The proposed pump station could operate continuously for up to 24 hours a day. Although pump stations would typically be operated remotely via SCADA, facility operators would conduct routine visits to the pump station site to monitor operations, conduct general maintenance activities, and service the pumps.

General operations and maintenance activities associated with pipelines would include annual inspections of the cathodic protection system and replacement of sacrificial anodes when necessary, testing and servicing of valves, vegetation maintenance along rights-of-way, and repairs of minor leaks in buried pipeline joints or segments.

3.4.3.2 Interconnections for Highway 68 Satellite Systems

With implementation of the proposed project, the Ryan Ranch, Hidden Hills, and Bishop satellite systems would stop pumping groundwater from the Laguna Seca Subbasin and would rely on MPWSP supplies instead.

3.4.4 Payback to Seaside Groundwater Basin

As part of the adjudication of the Seaside Groundwater Basin, CalAm must provide replenishment water supplies to the basin in an amount equivalent to the quantity of water that CalAm previously pumped in excess of the basin's natural safe yield.[15] In November 2012, the Seaside Groundwater Basin Watermaster and CalAm tentatively agreed to a replenishment schedule of 25 years at a replenishment rate of 700 afy, based on a running 5-year (water year) average. CalAm would meet its obligations via in-lieu recharge or artificial replenishment. Depending on fluctuations in precipitation and water supplies, the actual volume of water replenished during any given year would vary but would be equal to or greater than 700 afy based on a running 5-year average (Watermaster, 2012).

3.4.5 Power Demand

Under existing conditions, the electrical power needed to operate the water supply system in CalAm's Monterey District Service Area is 11,466,000 kilowatt hours per year (kWh/yr). That is the baseline electrical demand for the proposed project. With the proposed project, and accounting for the reduction in Carmel River pumping that would occur once the MPWSP Desalination Plant is brought online, the average annual power demand for the Monterey District Service Area would be 63,364,000 kWh/yr. Therefore, the net increase in annual electrical power demand for water production would be approximately 51,898,000 kWh/yr. Electrical power for all of the proposed project facilities would be provided via the PG&E power grid unless CalAm were to secure a separate renewable power source for some or all of its power needs.

The MPWSP would recover energy from the brine stream using pressure-exchanger technology.[16] Energy recovery is a process through which the energy contained in pressurized brine flow is transferred to a portion of the RO source water. This lowers source water pumping requirements and thus lowers overall energy consumption. Under the proposed project, energy recovery using pressure-exchanger technology would substantially reduce overall energy consumption during the RO process. This reduced consumption is reflected in the estimate of annual electrical power demand in the previous paragraph.

3.5 Permits, Approvals, and Regulatory Requirements

This EIR/EIS is intended to inform decision-makers of the environmental consequences associated with the proposed MPWSP. The proposed project would be subject to various regulations and could require discretionary permits from federal, state, and local jurisdictions. **Table 3-8** summarizes the permits and authorizations that would likely be required to build, operate, and maintain the proposed project. Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, explains how the project follows the applicable state, regional, and local plans relevant to each topical section in the chapter.

[15] As defined in Monterey County Superior Court's final decision in Case No. 66343, *California American Water v. City of Seaside, et al.* (Monterey County Superior Court, 2006), and as amended decision in February 2007 (Monterey County Superior Court, 2007), "natural safe yield" is the quantity of groundwater in the Seaside Groundwater Basin that occurs solely as a result of natural replenishment.

[16] Additional information on pressure-exchanger energy recovery systems is available at www.energyrecovery.com.

TABLE 3-8
ANTICIPATED PERMITS AND APPROVALS

Agency or Department	Permit or Approval	Discussion
Federal Agencies – *Consultations with federal agencies could be required if the proposed project is subject to a federal permit, such as a Clean Water Act Section 404 permit.*		
U.S. Army Corps of Engineers (Corps)	Permit under Section 404 of the Clean Water Act (33 USC §1344) Section 10 Permit of the Rivers and Harbors Act of 1899	• Projects that would discharge dredged or fill material into waters of the United States, including wetlands, require a Corps permit under Clean Water Act Section 404. • Projects that would place structures below the Ordinary High Water elevation of navigable waters of the United States require approval by the Corps.
U.S. Fish and Wildlife Service (USFWS)	<u>For "May Affect, but May Not Adversely Affect" determinations</u>: A letter of Concurrence is issued by USFWS to federal action agency <u>For "May Adversely Affect" determinations</u>: Biological Opinion under Section 7 of the Federal Endangered Species Act (FESA) (16 USC §1531 et seq.) and Incidental Take Statement in accordance with FESA Section 7, as amended (16 USC §1531 et seq.)	• The Federal Endangered Species Act (FESA) requires federal agencies to consult with the USFWS before implementing actions that may affect a federally listed species under their jurisdiction or may adversely modify designated critical habitat. MBNMS, as NEPA Lead Agency, must consult with the USFWS to determine whether the proposed action of issuing permits and authorizations for the proposed project is likely to adversely affect a federally-listed terrestrial or freshwater animal or plant species under USFWS jurisdiction, or that species' designated critical habitat; jeopardize the continued existence of species that are proposed for listing under FESA; or adversely modify proposed critical habitat. To support the USFWS determination, MBNMS prepared a Biological Assessment to initiate "formal consultation". The USFWS will issue a Biological Opinion concerning the effects of the project. If the USFWS finds that the project may jeopardize the species or destroy or modify critical habitat, reasonable and prudent alternatives to the action must be considered. • The USFWS authorizes the incidental take of federally listed species through an Incidental Take Statement that is supported by, and often attached to, the Biological Opinion, consistent with Section 7 of the FESA.
	Permit under the Migratory Bird Treaty Act (16 USC §§703–711)	• The incidental take of migratory birds or any part, nest, or eggs of a migratory bird also requires an Incidental Take Permit from the USFWS.
National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS)	<u>For "May Affect, but May Not Adversely Affect" determinations</u>: A letter of Concurrence is issued by NMFS to federal action agency <u>For "May Adversely Affect" determinations</u>: Biological Opinion under Section 7 of the Federal Endangered Species Act (FESA) (16 USC §1531 et seq.) and Incidental Take Statement in accordance with FESA Section 7, as amended (16 USC §1531 et seq.)	• The Federal Endangered Species Act (FESA) requires federal agencies to consult with the NMFS before implementing actions that may affect a federally listed species under their jurisdiction or may adversely modify designated critical habitat. MBNMS, as NEPA Lead Agency, must consult with the NMFS to determine whether the proposed action of issuing permits and authorizations for the proposed project is likely to adversely affect a federally-listed marine species under NMFS jurisdiction, or that species' designated critical habitat; jeopardize the continued existence of species that are proposed for listing under FESA; or adversely modify proposed critical habitat. To support the NMFS determination, MBNMS prepared a Biological Assessment to initiate consultation. • The NMFS issued a letter of concurrence on October 23, 2017.

TABLE 3-8 (Continued)
ANTICIPATED PERMITS AND APPROVALS

Agency or Department	Permit or Approval	Discussion
Federal Agencies (cont.)		
State Historic Preservation Office	Consultation with State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO) under Section 106 of the National Historic Preservation Act of 1966 (NHPA) (16 USC §470 et seq.)	• The NHPA requires federal permitting agencies to "take into account" the effects of a federal undertaking, or a proposed project, on properties included in the National Register of Historic Places or that meet National Register criteria, and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. Thus, as part of the federal consultations required by NEPA, the MBNMS must consult with the SHPO or THPO on behalf of the project applicant. • The SHPO issued a letter of concurrence on May 3, 2017
National Oceanic and Atmospheric Administration (NOAA)	Under the National Marine Sanctuaries Act and regulations, a permit or other approval is required from NOAA to allow a person to conduct an activity within a sanctuary that is otherwise prohibited.	• Otherwise prohibited activities within a national marine sanctuary may be allowed via the issuance of a permit or authorization. **A special use permit** (SUP) is available pursuant to Section 310 of the NMSA for any activity that is necessary (1) to establish conditions of access to and use of any Sanctuary resource or (2) to promote public use and understanding of a Sanctuary resource; and that does not injure Sanctuary resource. **An authorization** is available to allow the conduct of an activity prohibited by sanctuary regulations if such activity is specifically authorized by any valid federal, State, or local lease, permit, license, approval, or other authorization issued after the effective date of sanctuary regulation (15 CFR 922.49).
	Consultation with NMFS under Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (16 USC §1855(b))	• If MBNMS approves a project that could adversely affect designated Essential Fish Habitat (EFH), it must consult with NMFS. • The NMFS issued a letter of concurrence on October 23, 2017.
U.S. Army	Real property outgrants for construction and operation for non-Army users (Army Regulation (AR) 405-80, 200-1)	• AR405-80 sets forth the authority and prescribes policies for management of the United States of America title to real property under the jurisdiction or control of the Department of the Army, granting the use of that real property to non-Army users. • Under AR200-1, real property transactions require preparation of appropriate NEPA documentation per 32 Code of Federal Regulations (CFR) 651. Should a discretionary approval be required for use of U.S. Army property, this EIR/EIS will serve as the NEPA requirement for the action.
State Agencies		
California Public Utilities Commission (CPUC)	Certificate of Public Convenience and Necessity (Cal. Pub. Util. Code §1001 et seq.)	• This allows the applicant to build and operate the proposed project, and to recover its costs.
Fort Ord Reuse Authority (FORA)	Finding of substantial conformance with the Base Reuse Plan and the FORA Master Resolution Chapter 8 consistency criteria	• Applications for local agency legislative land use planning approval (such as a proposed county general plan amendment) come before the FORA Board of Directors for a determination of consistency between the application and the Base Reuse Plan.

TABLE 3-8 (Continued)
ANTICIPATED PERMITS AND APPROVALS

Agency or Department	Permit or Approval	Discussion
State Agencies (cont.)		
Central Coast Regional Water Quality Control Board (RWQCB)	Compliance with National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges of Storm Water Associated with Construction Activity (Order 2010-0014-DWQ)	• Any discharge of stormwater to surface waters of the United States from a construction project that encompasses 1 acre or more of soil disturbance requires compliance with the General Permit. This includes: – Development and implementation of a stormwater pollution prevention plan that specifies best management practices (BMPs) to prevent construction pollutants from contacting stormwater, with the intent of keeping all products of erosion from moving offsite into receiving waters – Elimination or reduction of non-stormwater discharges to storm sewer systems and other waters of the U.S. – Inspection of all BMPs
	NPDES permit under Section 402 of the Clean Water Act (33 USC §1342)	• Discharges of brine into surface waters of the United States, including wetlands and Monterey Bay National Marine Sanctuary, requires an NPDES permit. The *Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant* (Order No. R3-2014-0013, NPDES Permit No. CA0048551) would be revised to include the brine discharges from the MPWSP Desalination Plant.
	Waste Discharge Requirements under the Porter-Cologne Water Quality Control Act (Cal. Water Code §13000 et seq.)	• Any activity that results or may result in a discharge of waste that directly or indirectly impacts the quality of waters of the state (including groundwater or surface water) or the beneficial uses of those waters is subject to waste discharge requirements.
	Water Quality Certification under Section 401 of the Clean Water Act (33 USC §1341)	• Under Section 401 of the Clean Water Act, the RWQCB must certify that actions authorized under Section 404 of the Clean Water Act also meet state water quality standards. Any applicant for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into navigable waters, must provide the licensing or permitting agency a certification that the activity meets state water quality standards.
California Department of Fish and Wildlife (CDFW)	Incidental Take Permit under the California Endangered Species Act (CESA) (Cal. Fish and Game Code §2081)	• The take of any endangered, threatened, or candidate species may be permitted if it is incidental to an otherwise lawful activity and if the impacts of the authorized take are minimized and fully mitigated. No permit may be issued if the activity would jeopardize the continued existence of the species.
	Lake/Streambed Alteration Agreement (Cal. Fish and Game Code §1602)	• It is unlawful to substantially divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources, or to use any material from the streambeds, without first notifying the CDFW.
California Coastal Commission (CCC)	Coastal Development Permit under the California Coastal Act (Cal. Pub. Res. Code §30000 et seq.)	• Development proposed within the Coastal Zone requires a Coastal Development Permit from the CCC, except where the local jurisdiction has approved a Local Coastal Program (LCP). If so, the primary responsibility for issuing permits in coastal areas shifts from the CCC to the local government, although the CCC will hear appeals on certain local government coastal development decisions.

TABLE 3-8 (Continued)
ANTICIPATED PERMITS AND APPROVALS

Agency or Department	Permit or Approval	Discussion
State Agencies (cont.)		
California Coastal Commission (CCC) (cont.)		• Regardless of whether a Coastal Development Permit must be obtained from a local agency under an approved LCP, the CCC retains coastal development permit authority over new development proposed on the immediate shoreline, including intake and outfall structures on tidelands, submerged lands, and certain public trust lands, and over any development that constitutes a "major public works project." (Cal. Pub. Res. Code §§30601, 30600[b][2]).
	Federal Consistency Review under the Coastal Zone Management Act (16 U.S.C. §1456) and Federal Consistency regulations (15 C.F.R. Part 930, Subpart D)	• In accordance with 15 C.F.R. Part 930, Subpart D, the project applicant may be required to submit a federal consistency certification to the CCC. The CCC must then concur, conditionally concur, or object to the certification; no response from the CCC would be considered a presumed concurrence.
California Environmental Protection Agency, State Water Resources Control Board, Division of Drinking Water	Permit to Operate a Public Water System (Cal. Health and Safety Code §116525)	• The Division of Drinking Water has permitting authority over the operation of a public water system and oversees the quality of the desalinated water produced.
California Department of Transportation (Caltrans)	Encroachment Permit (Cal. Streets and Highway Code §660 et seq.)	• Caltrans has permitting authority over encroachments in, under, or over any portion of a state highway right-of-way, including Highway 156, Highway 68, and Highway 1.
California Department of Toxic Substances Control (DTSC)	DTSC hazardous waste management and disposal requirements under Title 22, Division 4.5, Chapter 11, Article 3, Soluble Threshold Limits Concentrations (STLC)/Total Threshold Limits Concentrations (TTLC); Review under local regulations for digging and excavation within certain areas of the former Ft Ord.	• DTSC would require soil management plans if contaminated soils are present along the pipeline alignment. Regulatory Requirements outline the concentrations at which soil and groundwater are a California Hazardous Waste. Title 22 would apply if contaminated soil or groundwater arising from trenching are a Hazardous Waste, subject to associated transport and disposal requirements. Under 40 CFR Part 261, concentrations of contaminated soil or groundwater may also be a Federal Hazardous Waste. • DTSC must approve digging and excavation in certain portions of the former Fort Ord military base (also see City of Seaside Digging and Excavation Permit).
California State Lands Commission (CSLC)	New Land Use Lease, for portion of the subsurface slant wells located below mean high tide, and Amended Land Use Lease, for use of the MRWPCA outfall and diffuser (Cal. Pub. Res. Code §1900)	• CSLC has jurisdiction and management authority over all ungranted tidelands and submerged lands in Monterey Bay under the Common Law Public Trust. On tidal waterways, the State's sovereign fee ownership extends landward to the mean high tide elevation.
California Department of Parks and Recreation	Easement, right-of-entry (ROE) and/or lease negotiations for 0.25 mile portion of the new Transmission Main that encroaches on Fort Ord Dunes State Park	• State Parks has jurisdiction and management authority over Fort Ord Dunes State Park and any easement, ROE and/or lease if granted, will need to be appraised using DGS guidelines and be accompanied by State Parks-approved legal descriptions.
State Water Resources Control Board (SWRCB)	Order approving change in Place of Use to allow Carmel River water to be injected and/or extracted by ASR-5 and ASR-6 wells	• The SWRCB has authority over the place of injection and use of Carmel River water under Permit 20808

TABLE 3-8 (Continued)
ANTICIPATED PERMITS AND APPROVALS

Agency or Department	Permit or Approval	Discussion
Local Agencies		
Seaside Groundwater Basin Watermaster	Permit for Injection/Extraction	• The Seaside Groundwater Basin Watermaster must approve injection/extraction activities that would affect the Seaside Groundwater Basin.
City of Seaside	Digging and Excavation Permit	• Excavations of more than 10 cubic yards within an Ordnance Remediation District, in the Former Fort Ord areas require a permit under Chapter 15.34, Digging and Excavation, of the Former Fort Ord Ordinance. Permit approval is subject to requirements placed on the property by an agreement between the City of Seaside, FORA, and DTSC.
City of Marina	Coastal Development Permit in accordance with the California Coastal Act (Cal. Pub. Res. Code §30000 et seq.)	• Where the City of Marina has jurisdiction through a Local Coastal Program, it must permit development proposed in the Coastal Zone, and the CCC retains jurisdiction over appeals. Where there is no Local Coastal Program, the CCC retains primary permit authority.
Monterey County Public Works Department	Encroachment Permit (Monterey County Code [MCC] Chapter 14.04)	• Designated activities within the right-of-way of a county highway require an Encroachment Permit from the director of the Public Works Department, whose decisions may be appealed to the Monterey County Board of Supervisors.
	Tree Removal Permit	• Removal of any protected trees requires a tree removal permit under Chapter 16.60 of the County's municipal code. Removal of more than three protected trees requires a forest management plan from the Director of Planning.
Monterey County Health Department, Environmental Health Division	Well Construction Permit (MCC Chapter 15.08)	• Monterey County's health officer must issue a written permit before anyone can build new water supply wells. Those decisions may be appealed to the Board of Supervisors.
	Permit to Construct Desalination Facility (MCC Chapter 10.72)	• Monterey County's director of environmental health, or their designee, must issue a permit before anyone can build or operate a desalination treatment facility (MCC Section 10.72.010). Permit decisions may be appealed to the director of environmental health within 30 days (MCC Section 10.72.080).
Monterey County Planning and Building Inspection Department	Conditional Use Permit (MCC Chapter 21.74)	• The Monterey County Zoning Ordinance requires a conditional use permit issued by the appropriate planning authority (e.g., the zoning administrator or the Planning Commission) for certain uses in specific zones. The permit decisions may be respectively appealed to the Planning Commission or the Board of Supervisors.
	Coastal Development Permit in accordance with the California Coastal Act (Cal. Pub. Res. Code §30000 et seq.)	• Where the County has jurisdiction through a Local Coastal Program, it must permit development proposed in the Coastal Zone, and the CCC retains jurisdiction over appeals. Where there is no Local Coastal Program, the CCC retains primary permit authority.
	Grading Permit (MCC Chapter 16.08)	• Subject to certain exceptions, grading requires a permit from the Monterey County Planning and Building Inspection Department. Grading permit decisions may be appealed to the five-member Board of Appeals, and then to the Board of Supervisors.
	Digging and Excavation Permit (MCC Chapter 16.10)	• A separate permit from the Monterey County Planning and Building Inspection Department is required for any project activities within the former Fort Ord military base. Permit decisions may be appealed to the Board of Appeals and then to the Board of Supervisors.

TABLE 3-8 (Continued)
ANTICIPATED PERMITS AND APPROVALS

Agency or Department	Permit or Approval	Discussion
Local Agencies (cont.)		
Monterey County Planning and Building Inspection Department (cont.)	Erosion Control Permit (MCC Chapter 16.12)	• The Director of Building Inspection must issue an Erosion Control Permit for any project development and construction activities (such as site cleaning, grading, and soil removal or placement) that are causing or are likely to cause accelerated erosion. Permit decisions may be appealed to the Board of Appeals and then to the Board of Supervisors.
Monterey Peninsula Water Management District (MPWMD)	Water System Expansion permit under with Ordinance 96 of the MPWMD Board of Directors	• Any project activity that would expand the water delivery system within the MPWMD's jurisdiction requires a permit.
Monterey Bay Unified Air Pollution Control District	Authority to Construct permit under Local Rule 3.1	• Projects that propose to build, erect, alter, or replace any article, machine, equipment, or other contrivance that may emit air contaminants from a stationary source or may be used to eliminate, reduce, or control air contaminant emissions require an authorization to construct permit.
	Permit to Operate under Local Rule 3.2	• Operating the diesel fuel-powered emergency generators, and any other articles, machines, equipment, or other contrivances that may emit air contaminants from a stationary source requires a permit to operate.
City of Monterey, City of Seaside, City of Marina, City of Pacific Grove	Land Use (including local coastal development permit(s), as necessary), Building, Public Health, Public Works, Tree/Vegetation Removal, and Encroachment Permits, and/or similar department approvals to those discussed above in the context of Monterey County, each issued in accordance with the applicable city's municipal code	• See related discussions provided in the context of Monterey County.
Transportation Agency for Monterey County (TAMC)	Encroachment Permit	• An encroachment permit is necessary to install conveyance pipelines along the TAMC right-of-way.

NOTES:
CFR = Code of Federal Regulations
PRC = Public Resources Code
USC = United States Code
MCC = Monterey County Code

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CHAPTER 4

Environmental Setting (Affected Environment), Impacts, and Mitigation Measures

4.1 Overview

This chapter summarizes the environmental setting ("affected environment") and assesses the environmental impacts or consequences that would result from building, operating and maintaining the Monterey Peninsula Water Supply Project (MPWSP or proposed project[1]) described in Chapter 3, Description of the Proposed Project, which consists of 10 subsurface slant wells at CEMEX. This chapter provides the CEQA- and NEPA-required analysis of the physical, biological, social, and economic issues associated with implementation of the proposed project. This introductory subsection is followed by issue-specific analyses of the potential effects of the proposed project. CEQA defines "effects" or "impacts" as the "[d]irect or primary effects which are caused by the project and occur at the same time and place" or the "[i]ndirect or secondary effects which are caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable." (CEQA Guidelines § 15358). Further, under CEQA, the term "significant effect on the environment" means "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected [directly or indirectly] by the project, including land, air, water, minerals, flora, fauna, ambient noise and objects of historic or aesthetic significance" (CEQA Guidelines § 15382).

Under NEPA, the term effects (or impacts) includes "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects,

[1] The CEQA terminology of "proposed project" is used when referring to the CalAm project and its impacts. When discussing impacts from both the federal action and CalAm project, the term "proposed project" is also used.

even if on balance the agency believes that the effect will be beneficial" (40 Code of Federal Regulations (CFR) § 1508.8).

This chapter documents the Lead Agencies' analysis of the direct, indirect, and cumulative effects that the proposed project might cause. It considers the impacts of short-term uses, such as construction-related truck traffic, air quality and noise. It also considers the impacts that would occur over the longer-term operation and maintenance period or that would persist after an initial occurrence, such as the discharge of brine into MBNMS from the desalination process. Finally, it identifies mitigation measures that could avoid or reduce adverse impacts, and summarizes the residual significant and unavoidable adverse impacts on an issue-by-issue basis.

The sections in this chapter are referred to as issue areas or topics. Each issue area section:

- defines the study area for the specific topic covered in the section;
- describes the regional and local environmental setting (the "affected environment");
- summarizes the applicable laws, regulations, plans, and standards (the "regulatory framework");
- identifies the thresholds and other criteria applied to determine whether a potential change to the environment as a result of the project would be significant;
- summarizes the analytical methodology used;
- analyzes direct, indirect, and cumulative effects;
- identifies mitigation measures to address adverse effects; and
- explains the residual impacts that would remain after the implementation of all recommended mitigation measures.

See Chapter 5, Alternatives Screening and Analysis, for descriptions and analyses of the alternatives. A summary of the alternatives is provided in **Table 4.1-1** for reference.

TABLE 4.1-1
OVERVIEW OF ALTERNATIVES EVALUATED IN DETAIL

<table>
<tr><th rowspan="2">Alternative</th><th colspan="5">Components</th></tr>
<tr><th>Intake Facilities</th><th>Brine Discharge/ Outfall Discharge Facilities</th><th>Desalination Plant</th><th>Conveyance Pipelines</th><th>Groundwater Replenishment Project Water Purchase Agreement</th></tr>
<tr><td>Proposed Project
Described in Chapter 3</td><td>9 new subsurface slant wells at CEMEX and conversion of test slant well to production well (10 total wells)
Intake capacity of 24.1 mgd</td><td>• Brine Disposal Pipeline and Brine Mixing Box
• Existing MRWPCA ocean outfall pipeline and diffuser
• Ocean Outfall End Gate Modification</td><td>New 9.6 mgd desalination plant on 25 acres at Charles Benson Rd. site</td><td>Source Water pipeline, Brine Discharge pipeline, Castroville pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR facilities, and Highway 68 interconnection improvements. Approximately 21 total miles of pipelines.</td><td>Not part of proposed project</td></tr>
<tr><td>No Project Alternative
Described in Section 5.4.2</td><td colspan="4">No new facilities would be constructed; payback to the Seaside Groundwater Basin would not occur; reliance on existing and planned water conservation and recycling programs; likely implementation of mandatory rationing and conservation measures.</td><td>CalAm would purchase and extract 3,500 afy of GWR water from the Seaside Groundwater Basin</td></tr>
<tr><td>Alternative 1 – Slant Wells at Potrero Road
Described in Section 5.4.3</td><td>10 new subsurface slant wells at Potrero Rd.
Existing test slant well at CEMEX removed
Same intake capacity (24.1 mgd) as proposed project.</td><td colspan="2" rowspan="2">Same as proposed project</td><td>Same as proposed project, plus a new source water pipeline between intake and desal plant that adds an additional 5.5 miles of source water pipeline. Approximately 26 total miles of pipelines.</td><td rowspan="2">Not part of alternative</td></tr>
<tr><td>Alternative 2 – Open-Water Intake at Moss Landing
Described in Section 5.4.4</td><td>New Screened Open-Water Intake at Moss Landing – one 36” diameter intake pipeline (HDD[1] installation)
Existing test slant well at CEMEX removed
Same intake capacity (24.1 mgd) as proposed project</td><td>Source Water pipeline, Brine Discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR facilities, and Highway 68 interconnection improvements, plus an additional 6.5 miles of source water pipeline. Approximately 27 total miles of pipelines.</td></tr>
<tr><td>Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)
Described in Section 5.4.5</td><td>New Screened Open-Water Intake at Moss Landing – same location as Alt. 2;
• two 42” diameter intake pipelines (HDD installation) and
• a 110’ L x 30’ W x 12’ tall intake structure
Existing test slant well at CEMEX removed
Larger intake capacity (49 mgd) than proposed project</td><td>New Outfall at Moss Landing;
• two 36” diameter discharge pipelines (HDD installation) and
• a 140’L x 10’ W x 15’ tall discharge structure</td><td>New 22 mgd desalination plant and co-located data center at 110-acre “East Tank Farm Parcel” off Dolan Road, Moss Landing</td><td>New Desalinated Water Pipeline, new Transmission Main, ASR facilities, and Highway 68 interconnection improvements, plus an 8 mi source water pipeline, transfer and brine discharge pipelines, and two new pipelines to serve other areas (Salinas and Santa Cruz Co; approximately 25 miles). Approximately 48 total miles of pipelines.</td><td>Not part of alternative</td></tr>
</table>

TABLE 4.1-1 (Continued)
OVERVIEW OF ALTERNATIVES EVALUATED IN DETAIL

<table>
<tr><th rowspan="2">Alternative</th><th colspan="5">Components</th></tr>
<tr><th>Intake Facilities</th><th>Brine Discharge/ Outfall Discharge Facilities</th><th>Desalination Plant</th><th>Conveyance Pipelines</th><th>Groundwater Replenishment Project Water Purchase Agreement</th></tr>
<tr><td>Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)
Described in Section 5.4.6</td><td>New Screened Open-Water Intake at Moss Landing – same general location as Alt. 2, but different installation
• 40" diameter pipeline, combination HDD and laid on seafloor (for 1,100')
• two 96" diameter screened intakes
Existing test slant well at CEMEX removed
Larger intake capacity (approx. 30 mgd) than proposed project</td><td>New Outfall at Moss Landing; extension of existing outfall
• 36" diameter pipeline, combination HDD and laid on seafloor (for 700')
• two 16" diameter diffuser ports</td><td>New 12 mgd desalination plant at former National Refractories facility in Moss Landing</td><td>New Desalinated Water Pipeline, new Transmission Main, ASR facilities, and Highway 68 interconnection improvements, plus an alternative 8-mile-long source water pipeline. Approximately 20 total miles of pipelines.</td><td>Not part of alternative</td></tr>
<tr><td>Alternative 5a[2] – Reduced Project 6.4-mgd Desalination Plant (Intake Slant Wells at CEMEX)
Described in Section 5.4.7</td><td>Same as proposed project, but fewer slant wells (7) at CEMEX
Smaller intake capacity (15.5 mgd) than proposed project</td><td rowspan="2">Same as proposed project except there would be less brine discharged.</td><td rowspan="2">New 6.4 mgd desalination plant at Charles Benson Rd site.</td><td>Same as proposed project, approximately 21 total miles of pipelines.</td><td rowspan="2">CalAm's purchase and extraction 3,500 afy of GWR water from the Seaside Groundwater Basin is considered in the cumulative analysis</td></tr>
<tr><td>Alternative 5b – Reduced Project 6.4-mgd Desalination Plant (Intake Slant Wells at Potrero Road)
Described in Section 5.4.8</td><td>Same as Alternative 1, but fewer slant wells (7) at Potrero Road
Existing test slant well at CEMEX removed
Smaller intake capacity (15.5 mgd) than proposed project</td><td>Same as proposed project, plus an additional 5.5 miles of source water pipeline, approximately 26 miles of pipelines.</td></tr>
</table>

NOTES:

1 Horizontal Directional Drilling (HDD) is described in Section 3.3.4.2 in Chapter 3, Description of the Proposed Project

2 Alternative 5 includes a reduced size desalination plant. The CPUC authorized CalAm to enter into a water purchase agreement for 3,500 afy from the GWR Project, and to build the new Monterey Pipeline and associated pump station needed for the GWR project, in September 2016. As a result, the GWR project is a reasonably foreseeable future project, and the cumulative impact scenario evaluated for Alternatives 5a and 5b includes implementation of the GWR project. The GWR project is not considered for cumulative impacts in conjunction with the proposed project or Alternatives 1, 2, or 4 because if a desalination option is selected that is of a size sufficient to fully satisfy the project objectives in terms of water supply, such choice would presumably mean that the GWR project was not successful in securing funding, completing construction and undertaking operations. The GWR project is conservatively considered for cumulative impacts with Alternative 3 because under that option, CalAm could meet its full project water supply objectives via the DeepWater Desal project, or could obtain water from a combination of the DeepWater Desal project and the GWR Project. See Table 4.1-2 in Section 4.1.

4.1.1 Scope of Analysis

Chapter 4 is organized by issue area or topic, as follows:

Sections			
4.2	Geology, Soils, and Seismicity	4.11	Greenhouse Gas Emissions
4.3	Surface Water Hydrology and Water Quality	4.12	Noise and Vibration*
4.4	Groundwater Resources	4.13	Public Services and Utilities
4.5	Marine Biological Resources	4.14	Aesthetic Resources
4.6	Terrestrial Biological Resources	4.15	Cultural and Paleontological Resources
4.7	Hazards and Hazardous Materials*	4.16	Agricultural Resources*
4.8	Land Use, Land Use Planning, and Recreation*	4.17	Mineral Resources
4.9	Traffic and Transportation*	4.18	Energy Conservation*
4.10	Air Quality	4.19	Population and Housing*
		4.20	Socioeconomics and Environmental Justice

* Issue areas in which MBNMS resources would not be affected.

Each section of Chapter 4 contains the following elements:

- **Table of Contents and Introduction.** This section presents a table listing the subsections, figures, and tables within the resource section. It also briefly introduces the resource topic. During the public scoping process and during the public comment period for the April 2015 Draft EIR, comments received from parties and members of the public raised issues and concerns and made suggestions regarding the scope of the analysis. These scoping and Draft EIR comments were carefully reviewed. To the extent that the issues raised or suggestions made were relevant to the EIR/EIS, they are described in this introductory text and addressed in the analysis. Likewise, revisions made to the section as a result of authors' changes or comments received on the January 2017 Draft EIR/EIS, are also described.

- **Setting/Affected Environment.** This section presents a description of the existing environmental conditions near the project with respect to each resource topic at a level of detail that allows the reader to understand the impact analysis. This section provides the environmental baseline for the impact analysis. The focus of the affected environment description is on those resources or uses that may be affected by specific proposed project components. The study area for the EIR/EIS varies by topic, but is generally the proposed project area and adjacent properties. In some issue areas, the study area is necessarily larger than the project area because there is potential for impacts to occur beyond the project boundaries. The nature of existing conditions in the study area is interpreted from available literature and site-specific surveys, summarized in the resource sections. Where sufficient location-specific information is available, these data are primarily utilized. Where location-specific data are lacking, general conditions for the study area are utilized with appropriate qualifications.

- **Regulatory Framework.** This section describes the relevant laws and regulations that protect the environmental resources within the project area, and the governmental agencies that enforce those laws and regulations. The discussion of pertinent laws and regulations also evaluates the project's consistency with such regulatory requirements that were enacted for environmental protection purposes. Where a potential inconsistency with such regulations is identified, readers are referred to the discussion of the direct and indirect effects of the project within that topical area for further analysis of the issue.

- **Evaluation Criteria.** This section lists the specific criteria, also known as thresholds of significance, that were applied when evaluating the environmental impacts of the proposed project (10 slant wells at CEMEX) in Chapter 4, as well as the impacts of the alternatives, which are described and evaluated in Chapter 5, Alternatives Screening and Analysis. The list is based on Appendices G and F of the CEQA Guidelines with some modifications to account for NEPA considerations and to ensure that the criteria correlate to and measure the expected effects of the project. For certain resource topics, the Lead Agencies developed additional criteria to capture the environmental effects of the proposed project or its alternatives, as set forth in Chapter 5.

- **Approach to Analysis.** This section explains how the Lead Agencies applied the significance criteria to evaluate the proposed project in Chapter 4 and to the alternatives in Chapter 5. This section also describes modeling or other methodology used to quantify impacts.

- **Direct and Indirect Effects of the Proposed Project.** This section evaluates the potential for the proposed project to adversely affect the physical and human environment described in the setting, draws impact conclusions, discusses consistency with plans and policies and describes mitigation.

  CEQA and NEPA both require consideration of direct and indirect effects. Under CEQA, direct effects are those caused by the project itself and that occur at the same time and place; indirect impacts are those caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable (CEQA Guidelines § 15358). The definitions under NEPA are substantially similar (40 CFR § 1508.8). Under NEPA, direct effects “are caused by the action and occur at the same time and place" (40 CFR § 1508.8(a)); indirect effects “are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems” (40 CFR § 1508.8(b)). The overall methodology for each issue area or topic is consistent with Council on Environmental Quality (CEQ) guidance and NOAA NEPA guidelines (NAO 216-6A, January 2017), as well as with the CEQA Guidelines.

  The impact analysis for each issue area includes a description of how the proposed project/action would result in a change in the environment relative to existing conditions, and the current regulatory framework. The analysis within each topic focuses on components of the proposed project that could result in potentially significant effects. Both adverse and beneficial impacts are identified, where relevant. For most resource topics, all construction-related impacts are discussed first, followed by all operations/facility siting impacts. For purposes of CEQA, the conclusion of each impact analysis is expressed in terms of impact significance, which is discussed further in Section 4.1.4, below.

  This section also discusses the proposed project’s consistency with plans, policies, and regulations adopted for the purpose of avoiding or mitigating an environmental effect as well as a discussion of the possible conflicts between the proposed project and the objectives of federal, regional, state, and local land use plans and policies that are imposed for the protection of the environment, and is described in Section 4.1.5, below.

  This section also identifies mitigation measures for all of the impacts considered significant or potentially significant, as well as for some impacts that are less than significant. This is consistent with CEQA and NEPA, as discussed further in Section 4.1.6.

- **Cumulative Effects of the Project.** This section evaluates the cumulative direct and indirect impacts of the construction, operation, and maintenance of the proposed project. Details on CEQA/NEPA requirements and the cumulative effects methodology are provided in Section 4.1.7. If the proposed project/proposed action would have no direct or indirect effects on a resource, then it could not cause or contribute to potential cumulative effects on that resource. In these instances, the Lead Agencies did not perform a cumulative effects analysis. See, for example, Section 4.1.2, Resources/Issues Not Affected.

4.1.2 Resources/Issues Not Affected

Of the issues commonly analyzed in a CEQA or NEPA process, the following list summarizes issues not analyzed in this EIR/EIS, why the proposed project or alternatives would not affect these resources, and why more study in this EIR/EIS is not warranted. 40 CFR 1502.2(b). Resources that are not present on the project site, or resources that the project will not significantly affect, include Forestry Resources and Military and Homeland Security Uses. Neither the proposed project nor any of the alternatives would cause or contribute to any cumulative effects on these resources.

4.1.2.1 Forestry Resources

Implementation of the proposed project would have a significant impact on forestry resources if it:

- Conflicts with existing zoning for, or causes rezoning of, forest land (as defined in Cal. Public Resources Code § 12220(g)), timberland (as defined by Cal. Public Resources Code § 4526), or timberland zoned Timberland Production (as defined by Cal. Government Code § 51104(g));
- Results in the loss of forest land or conversion of forest land to non-forest use; or
- Involves other changes in the existing environment that, due to their location or nature, could result in conversion of forest land to non-forest use.

None of the land in the project area is zoned as forest land, timberland, or included in a Timberland Protection Zone, and no rezoning of any kind would be required to build the proposed project. Cal. Public Resources Code § 12220(g) defines “forest land” as “land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.” Cal. Public Resources Code § 4526 defines “timberland” as “land, other than land owned by the federal government and land designated by the board [of the California Department of Forestry and Fire Protection (CAL FIRE)] as experimental forest land, which is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products, including Christmas trees. Commercial species shall be determined by the board on a district basis.”

In Monterey County, CAL FIRE has designated the following as qualifying commercial timber species: coast redwood, Douglas fir, Monterey pine, Coulter pine, Ponderosa pine, Jeffrey pine, white alder, cottonwood, Pacific madrone, California black oak, and tanoak. Timberland includes areas where the qualifying species are now growing naturally or have grown naturally in the recorded past, even if they are not currently present. Cal. Government Code § 51104(g) defines

"Timberland production zone" as "an area which has been zoned pursuant to [Government Code] Section 51112 or 51113 and is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses," which include uses that do not "significantly detract from the use of the property for, or inhibit, growing and harvesting timber" (Gov't Code § 51104[g]). Because none of the project area land is zoned for forestry use, and the project needs no forestry-related rezoning, the proposed project would not conflict with such zoning. Similarly, no forest land would be lost or converted to non-forest use as a result of the proposed project, and the project would not involve other changes in the existing environment that, due to their location or nature, could result in conversion of forest land to non-forest use. Therefore, the proposed project would not impact forestry resources.

4.1.2.2 Military and Homeland Security Uses

A portion of the new Transmission Main would be located on military lands and the ASR-5 Well and ASR-6 Well would be located in the Fitch Park military housing community. The construction impacts associated with the new Transmission Main and ASR-5 Well and ASR-6 Well are analyzed throughout this document. Construction impacts on military and homeland security uses would be temporary and negligible[2]. Furthermore, construction and operation of project components in MBNMS would not interfere with any military or homeland security uses of MBNMS. Therefore, this document does not further discuss military and homeland security uses.

4.1.3 Baseline Conditions

The baseline for this EIR/EIS is the existing condition on or about October 5, 2012, updated with new data as appropriate, which is when the CPUC issued a Notice of Preparation (NOP) for the proposed project to local, state, and federal agencies, Native American tribal organizations, and other interested parties. Although the Notice of Intent for the NEPA review contained within this document was issued in 2015, use of the 2012 baseline is appropriate and reasonable because (i) 2012 is a very recent point in time; (ii) the CPUC invested considerable resources amassing 2012 background/baseline data for the April 2015 Draft EIR; and (iii) environmental conditions in the study area have been relatively static such that 2012 conditions remain representative of meaningful baseline conditions. The environmental baseline reflects the pre-project environmental conditions to which the potential impacts of the proposed project and all alternatives are compared.

Since the CPUC issued its NOP in 2012, the Lead Agencies have developed or received new data on some of the resource areas, so they have updated the baseline data as appropriate. This document notes those updates in its discussions of the Setting/Affected Environment for the various resource areas and applies them in the pertinent analyses. For instance, in Section 4.6,

2 When reaching significance conclusions, the analysis also adopts the definition of "negligible" used under NOAA NEPA policy, which is a level of impact that is below minor to the point of being barely detectable and therefore discountable. (NOAA NAO 216-6A Companion Manual Appendix A).

Terrestrial Biological Resources, updates to survey information for biological resources are described in Section 4.6.1.2, Information Sources and Survey Methodology.

4.1.4 Impact Terminology

CEQA requires agencies to use their best judgment to determine whether an impact is significant; it's not a mechanical process. The agency must base its decision in light of the whole record, and must consider the impact's setting: "For example, an activity which may not be significant in an urban area may be significant in a rural area." (CEQA Guidelines § 15064(a)(1), (b)). Similarly, to determine whether an impact is significant, CEQ regulations (40 CFR § 1508.27) require the consideration of the context and intensity of potential impacts. Context normally refers to the setting, whether local or regional, and intensity refers to the severity of the impact. Also, the analysis includes a discussion of the possible conflicts between the proposed project and the objectives of federal, regional, state, and local land use plans and policies for the area concerned (40 CFR § 1502.16(c)).

Consistent with both CEQA and NEPA requirements and guidance, determinations regarding an impact's significance in this EIR/EIS are made on the basis of high quality, credible scientific information and professional judgment. Where a significant impact is reasonably expected to occur, this analysis discloses that information. All impact determinations are projections based on the expectation that the described impacts, or lack thereof, will occur if the proposed project is approved and implemented. Therefore, the impacts are conditioned upon approval and implementation of the project, and the term "would/would not occur" is used to describe the reasonable expectation of the impacts of the project.

The categories used to designate impact significance are:

- **No Impact (NI).** There would be no impact if there is no potential for impacts, or if the environmental resource does not occur within the project area or the area of potential effect. For example, there would be no impact related to tree removal if no tree removal is proposed in the project area.
- **Less than Significant impact (LS).** This determination applies if there is a potential for some limited impact, but not a substantial adverse (or beneficial) effect that qualifies under the applicable significance criterion as a significant impact.
- **Less than Significant impact with Mitigation (LSM).** This determination applies if the project would result in an adverse effect that exceeds/qualifies under the applicable significance criterion, but feasible mitigation is available that would eliminate any adverse impact or reduce it to a less-than-significant level.
- **Significant and Unavoidable impact even with implementation of Mitigation (SU).** This determination applies if the proposed project would result in an adverse effect that exceeds/qualifies under the applicable significance criterion and even with mitigation implemented to lessen the impact, if available, the residual effect would remain significant. Therefore, the impact would be significant and unavoidable.

In accordance with NEPA, 40 C.F.R. 1508.8, beneficial environmental impacts of the proposed action are also discussed in the analysis.[3] Beneficial impacts are incorporated into the above impact significance categories as “less than significant”. Beneficial impacts are also depicted in green shading in Table 5.6-1.

Within each issue area section in this chapter, there is a table at the beginning of the impact discussion that summarizes the potential impacts and indicates the level of impact significance. Environmental impacts are numbered throughout this EIR/EIS, using the section number followed by sequentially numbered impacts. Mitigation measures are numbered to correspond with the impact numbers; for example, Mitigation Measure 4.3-1 addresses Impact 4.3-1. In some cases, mitigation measures are used again to address sequentially later impacts. When this occurs, the measures are not renumbered or repeated in full; rather, the reader is directed to review the mitigation measure where it is first introduced.

4.1.5 Project Consistency Analysis

Consistent with CEQA, the EIR/EIS includes a discussion of any inconsistencies between the project and applicable general plans, specific plans, and regional plans and any conflicts between the project and applicable plans, policies, and regulations of agencies with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect (CEQA Guidelines section 15125 and Appendix G). Also, per NEPA, the analysis includes a discussion of the possible conflicts between the proposed project and federal, regional, state, and local land use laws, requirements, policies, and/or plans for the area concerned that are imposed for the protection of the environment (40 CFR § 1502.16(c) and 40 CFR § 1508.27(b)(10)).

The discussion of project consistency appears within each topical section’s Regulatory Framework subsection. Federal and state requirements related to the subject topic are presented in a narrative format, followed by the analysis of project consistency. Owing to their relatively larger number of specific requirements, regional and local plans, policies, and regulations, and the associated consistency analyses, are presented in a table format. The table appears after the discussion of federal and state requirements within each topical section.

Where the consistency analysis concludes the MPWSP would not conflict with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes that the MPWSP may conflict with the applicable plan, policy, or regulation, the reader is referred to the respective topic’s Direct and Indirect Effects of the Project subsection, where the issue is discussed further. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

The proposed project’s consistency with the full set of MBNMS Desalination Guidelines is addressed separately in Section 6.4 since the Guidelines are relevant to multiple issue areas.

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[3] Under CEQA, significant environmental impacts are limited to adverse (not beneficial) impacts. CEQA defines “significant effect on the environment” as “a substantial, or potentially substantial, adverse change in the environment.” 14 Cal. Code R. 21068.

4.1.6 Mitigation Measures

This chapter identifies feasible mitigation measures to avoid, minimize, or compensate for impacts of the proposed project consistent with CEQA and NEPA requirements. Regardless of the effect of the measure – whether to avoid, minimize, or mitigate for an impact – this document uses the term “mitigation measure” to label these measures, consistent with CEQA and NEPA guidance described below.

CEQA Guidelines Section 15126.4(a)(1) states that an EIR “shall describe feasible measures which could minimize significant adverse impacts.” Section 15041 describes the authority of a CEQA lead agency to “require feasible changes in any or all activities involved in the project in order to substantially lessen or avoid significant effects on the environment, consistent with applicable constitutional requirements such as the ‘nexus’ and ‘rough proportionality’ standards established by case law (*Nollan v. California Coastal Commission* (1987) 483 U.S. 825, *Dolan v. City of Tigard*, (1994) 512 U.S. 374, *Ehrlich v. City of Culver City*, (1996) 12 Cal. 4th 854.).” Section 15092(b)(2) states that a public agency shall not decide to approve or carry out a project for which an EIR was prepared unless the agency has “Eliminated or substantially lessened all significant effects on the environment where feasible” and determined that any remaining significant and unavoidable impacts are acceptable due to overriding considerations. Thus, a CEQA lead agency must describe and adopt all feasible mitigation measures for impacts found to be significant, but is limited to requiring mitigation only for significant impacts and within the limitations of the nexus and rough proportionality standards.

CEQ NEPA guidance for Federal Departments and Agencies on the Appropriate Use of Mitigation (76 FR 3843, Jan. 21, 2011) clarifies that when an agency premises its environmental analysis on a commitment to mitigate the environmental impacts of a proposed action, it should adhere to those commitments, monitor how they are implemented, and monitor the effectiveness of the mitigation. For example, the agency could impose appropriate conditions on permits or other agency approvals, or could make approvals contingent on implementation of the mitigation commitments. Although NEPA does not impose a similar procedural obligation on federal agencies as CEQA requires, the practice to adopt feasible mitigation whenever possible to reduce a project’s significant impact is consistent with NEPA’s intent that mitigation be discussed in sufficient detail to ensure that environmental consequences have been fairly evaluated. Consistent with the federal agency’s authority and responsibility under NEPA, this chapter identifies some feasible mitigation measures to lessen impacts that are adverse but do not rise to the level of being classified as significant impacts.

Mitigation measures included in this EIS/EIR are considered to be potentially feasible by the authors of the document; however, the ultimate determination of feasibility can be made only by agency decision-makers. This EIS/EIR addresses whether mitigation presented would reduce an impact to a less-than-significant level, based on the thresholds of significance presented in each resource chapter, except in those cases where the NEPA lead agency identifies feasible mitigation for adverse impacts that are not significant.

The Lead Agencies will prepare a Mitigation, Monitoring, Reporting, and Compliance Program (MMRCP)/ Environmental and Construction Compliance Monitoring Plan (ECCMP) prior to approval of the proposed project or an alternative analyzed in Chapter 5. This will ensure that any mitigation measures are effectively implemented. Such document will be prepared at or after the time that the Final EIR/EIS is published so as to capture all mitigation measures, but before the Record of Decision is made, and it would be made available to the public prior to adoption.

4.1.7 Cumulative Effects

Cumulative impacts, as defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects that, when taken together, are "considerable," or that compound or increase other environmental impacts. Cumulative impacts can result from projects that are individually minor but collectively significant when added to the impacts of other closely related past, present, or reasonably foreseeable future projects. Section 15130 of the CEQA Guidelines states:

- An EIR shall discuss cumulative impacts of a project when the project's incremental effects are "cumulatively considerable" (i.e., the incremental effects of an individual project are considerable when viewed in combination with the effects of past, current, and probable future projects, including those outside the control of the agency, if necessary).
- An EIR should not discuss impacts that do not result in part from implementation of the project being evaluated in the EIR.
- A project's contribution is less than cumulatively considerable, and thus ultimately less than significant, if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.
- The discussion of cumulative impact severity and likelihood of occurrence need not be as detailed as that presented for effects attributable to the project alone.
- The focus of analysis should be on the cumulative impact to which the identified other projects contribute, rather than on attributes of the other projects that do not contribute to the cumulative impact.

The CEQ's NEPA regulations also require agencies to assess a proposed action's cumulative impacts (40 CFR Parts 1500-1508). Both CEQ regulations and NOAA Administrative Order Series (NAO) 216-6A define a cumulative impact as an "impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7, NAO 216-6). Cumulative impacts can result from individually minor but collectively significant actions taking place over time (40 CFR § 1508.7).

The CEQ states that NEPA documents "should compare the cumulative effects of multiple actions with appropriate national, regional, state, or community goals to determine whether the total effect is significant" (CEQ, 1997). Cumulative effects may arise from single or multiple actions and may result in additive or interactive effects. Interactive effects may be countervailing, where the adverse cumulative effect is less than the sum of the individual effects, or synergistic, where the net adverse effect is greater than the sum of the individual effects (CEQ, 1997).

This section presents the methods used to evaluate cumulative impacts, and lists projects that may have cumulative effects when combined with the impacts from the proposed project or alternatives discussed in this EIR/EIS. The MPWSP's cumulative effects analysis is provided by topical section throughout Chapter 4. Where appropriate, additional measures are identified to mitigate potentially significant cumulative impacts. The cumulative effects of project alternatives are analyzed in Chapter 5, Alternatives Screening and Analysis, Sections 5.5 and 5.6.

4.1.7.1 Approach to the Analysis of Cumulative Effects

CEQ's cumulative effects guidance sets out several different assessment methods, such as checklists, modeling, forecasting, and economic impact assessment, that evaluate changes in employment, income and population (CEQ, 1997).

This EIR/EIS uses a variety of methods, depending on the resource, to determine cumulative effects. Consistent with CEQA and NEPA, this EIR/EIS considers the direct and indirect effects of the proposed project[4] combined with the effects of the other projects that could combine geographically and temporally (i.e., would be causing accumulation of similar effects or synergistic interaction of different impacts in the same area at the same time as the proposed project) and, thereby, cause or contribute to a cumulative effect. For each resource or issue considered in this chapter, the cumulative effects analysis identifies the relevant geographic area and time period within which cumulative effects could occur and then considers existing conditions (which are the combination of the natural condition and the effects of past projects). Then, as the first part of the two-step cumulative impact process, the analysis describes the effects of other past, present and reasonably foreseeable future projects in combination with the effects of the proposed project. Where relevant, the cumulative effects analysis also describes the relationship of the cumulative effects to any established thresholds. A quantitative analysis is provided where possible; where quantification is infeasible, qualitative effects are described. Where the analysis finds that the cumulative effects of past, present and future projects plus the proposed project would be significant and adverse, the analysis then embarks upon the second step of the cumulative impact process. That step identifies whether the proposed project's contribution to the overall adverse effect would be of a considerable nature (referred to as a "cumulatively considerable contribution" under CEQA) such that the project's contribution to cumulative effects in that area is deemed significant. In essence, it is only if the answer is affirmative in both steps of the analytical process that the project's contribution to the overall significant adverse cumulative effect is deemed a significant effect associated with the project. If the proposed project would make a meaningful contribution to the adverse cumulative effect so as to be considered a significant effect associated with project implementation, mitigation measures are explored and identified.

4 An example of indirect effects of the proposed project is the impacts stemming from implementation of mitigation measures set forth in this EIR/EIS. The cumulative analyses within each topic area treat the project contribution to cumulative impacts as that of the project directly and all indirect effects identified in the EIR/EIS.

4.1.7.2 Cumulative Scenario

CEQA Guidelines Section 15130(b)(1) discusses two approaches to a cumulative effects analysis. First, the analysis can be based on a list of past, present, and probable future projects producing related or cumulative impacts. Second, a summary of projections contained in a general plan or related planning document or in an adopted or certified environmental document that described or evaluated regional or area-wide conditions contributing to the cumulative impact can be used to determine cumulative impacts. This EIR/EIS employs the list-based approach, except where specifically discussed in individual resource sections in Chapter 4, where a summary of projections approach is more appropriate. To determine an appropriate list of projects for the cumulative analyses, the Lead Agencies considered three factors: similar environmental impacts, geographic scope and location, and timing and duration of implementation. The effects of relevant projects (e.g., short-term construction or demolition, or long-term operations) could happen at the same time as the MPWSP's effects.

The projects that could contribute to cumulative impacts are listed in **Table 4.1-2**. The projects in Table 4.1-2 have occurred[5] or are anticipated to occur in the reasonably foreseeable future within the study area. This list was compiled from several sources. Only those projects that might contribute to cumulative impacts are listed. These projects are similar in scope to the proposed project, have similar types of impacts within the study area, affect similar resources, or are large enough to have far-reaching effects on a resource. This approach includes both projects for which detailed descriptions and expected impacts are known, as well as projects that have less defined impacts but may contribute to the regional impacts. The Lead Agencies have considered the effects of these projects along with the proposed project's impacts to determine the overall cumulative impact on the resources in the study area. The numbering of projects in Table 4.1-2 provides a key to the locations of the projects shown in **Figure 4-1**; some projects are listed out of numeric order in Table 4.1-2 due to additions throughout the preparation of this EIR/EIS.

Within the project vicinity, there are several other substantial water supply projects that are proposed or are under construction. Details concerning the manner in which each of these projects is addressed in the cumulative analysis in this EIR/EIS are set forth below.

Pure Water Monterey Groundwater Replenishment Project

The Pure Water Monterey (PWM) Groundwater Replenishment (GWR) Project has a unique treatment in this EIS/EIR in that it is both a project component and is included in the cumulative impact scenario, depending on the alternative being addressed. As described in Chapters 1 and 3, CalAm's application includes two capacity options or build-out scenarios: the "Proposed Project" is a full capacity (9.6 mgd) option and presumes that GWR will not be built. Alternatives 1 and 2 are variations of the full capacity option. Alternative 5a, also proposed by CalAm as an alternative to the full capacity option, combines a reduced-capacity desalination plant (6.4 mgd)

5 While a cumulative analysis includes past, present and reasonably foreseeable future projects, the category of past projects is captured within the existing setting, or baseline, against which impacts are judged throughout the EIR/EIS, including the cumulative analysis. However, where projects were implemented after 2012 (the baseline year), those projects are set forth within Table 4.1-2 and included in the cumulative analysis.

with a water purchase agreement for 3,500 acre-feet per year (afy) of advanced treated water from the GWR project. A water purchase agreement for the GWR project water had been approved by the CPUC and executed by CalAm and the MRWPCA, making the reduced capacity desalination plant a more likely option than the full capacity desalination plant. Alternative 5b is a variation of the reduced capacity option (it places the intake in a different location).

The Proposed Project and Alternatives 1 and 2 assume that GWR would not be operational, and as such, GWR is not considered in the cumulative impacts scenario for these alternatives. The basis for this assumption is that, given the structure of CalAm's proposal and the fact that the water purchase agreement has been approved, the full capacity desalination plant would not be pursued if the GWR water is available to CalAm. On the other hand, the reduced capacity option reflected in Alternatives 5a and b assumes that GWR would be operational; therefore, the GWR project is assumed to occur in the cumulative impacts scenario for the reduced capacity options and is treated as a cumulative project for those analyses.

The project proponent for Alternative 3, Deepwater Desalination, has publicly stated that it would continue to pursue a 22 mgd capacity desalination plant regardless of other project proposals, and as such, GWR is assessed in the cumulative scenario for this alternative. Alternative 4, the People's Project, is proposed as a 12 mgd capacity desalination plant to provide 13,400 afy to meet both projected demand and future needs primarily for CalAm to meet the project objectives of the MPWSP. The 12 mgd capacity proposal does not presume that GWR will be built because if GWR is operational and providing water to CalAm under the approved water purchase agreement, CalAm would not need the capacity of supply proposed by the People's Project. Since the GWR project and the People's Project appear to be mutually exclusive (absent a reduced capacity People's Project, which is not envisioned by its proponents, see Section 5.2) the GWR project is not considered in the cumulative scenario for Alternative 4.

Other Cumulative Scenarios

As stated in Section 4.1.7, the cumulative impact analysis focuses on the impacts on the environment which result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions. As explained in Section 5.1.1, under CEQA and NEPA, the EIR/EIS must identify and analyze the impacts of reasonable alternatives that would also meet the purpose and need, and would avoid or minimize adverse impacts. The DeepWater Desal (Alternative 3) and the People's Project (Alternative 4) are best understood as alternatives to the MPWSP because they each are desalination projects being separately proposed to provide water supply for the region.

The DeepWater Desal Project (Alternative 3) is also considered in the cumulative impacts analysis for each of the alternatives because the project proponent has indicated that it intends to proceed even if another desalination plant is selected to serve the Monterey Bay region. Alternative 3 would include the construction and operation of a seawater desalination facility and co-located data center to provide up to 25,000 afy of potable water and data transmission and storage services. Alternative 3 would be developed to meet a regional need for water, and CalAm would be one of several customers of the supply. As such, Alternative 3 is considered in the cumulative effects scenario for the proposed project and all alternatives.

The primary purpose of the People's Moss Landing Project (Alternative 4) as described in the Moss Landing Harbor District's June 2015 Notice of Preparation (NOP), is to rehabilitate existing facilities at the Moss Landing Green Commercial Park to develop 12 mgd (13,400 afy) of desalinated water to meet the current and future needs of the Monterey Peninsula and/or the North Monterey County area. As stated in the NOP, the People's Project applicant has used CalAm's required need for replacement supplies, and water needs of the General Plan Build-out and/or for serving water demands in North Monterey County to size this alternative; therefore, a smaller capacity People's Project has not been considered in this EIR/EIS. Since the People's Project and the MPWSP would both serve the same customers, this EIR/EIS considers the People's Moss Landing Project as an *alternative* to the MPWSP (see Chapter 5). Unlike the DeepWater Desal Project, whose proponent has publicly stated its intent to proceed even if the MPWSP is built and whose business model and design includes a co-located data center, no available information indicates that the People's Project would be built *in addition* to the proposed MPWSP or other alternative if it is selected. Therefore, it is not a reasonably foreseeable project in the cumulative scenario for the proposed project or any of the alternatives. Similarly, if the DeepWater Desal Project were selected instead of the MPWSP, the People's Project would not be a reasonably foreseeable project in the cumulative scenario, because Alternative 3 assumes that all of the Monterey Peninsula's water supply needs would be met by the DeepWater Desal Project and no demand (and therefore, no market) would remain in the Monterey Peninsula for the People's Project to serve. As noted above, however, if the People's Project were approved to serve the water needs of the Monterey Peninsula, the EIR/EIS cumulative analysis does assume that the DeepWater Desal project would be a cumulative project along with the People's Project.

Furthermore, the California Ocean Plan requires that desalination project applicants document the need for water. The Ocean Plan states that the regional water board shall require the owner to: "Consider whether the identified need for desalinated water is consistent with an applicable adopted urban water management plan prepared in accordance with California Water Code Section 10631, or if no urban water management plan is available, other water planning documents such as a county general plan or integrated regional water management plan." If any project is approved to serve demand in the Monterey Peninsula, it is unlikely that another project with the intent to serve this same population would be able to provide the necessary documentation of the need for water. Despite this, and in light of DeepWater Desal's stated intention, this EIR/EIS takes a conservative approach and considers DeepWater Desal in the cumulative scenarios as described above.

Similar Environmental Impacts

Projects that are relevant to the cumulative analysis include those that could incrementally affect the same environmental resources that the MPWSP would directly or indirectly affect. The cumulative impact discussions in the issue area sections of Chapter 4 analyze the cumulative impacts that could occur when the effects of the MPWSP combine with the effects of other past, present, and reasonably foreseeable future projects. Because these other projects are subject to independent environmental review and approval processes, funding constraints, or other challenges, it is possible that some of the projects identified as reasonably foreseeable future projects will not be approved (or if already approved, will not be implemented) or will be modified prior to approval. To assess worst-case cumulative impacts, however, the cumulative impact analysis in this EIR/EIS assumes that all of the reasonably foreseeable projects identified in this analysis will be approved and built.

Geographic Scope and Location

For each affected resource, the geographic scope of the cumulative impacts analysis depends on the natural boundaries and physical conditions relevant to the resource, rather than jurisdictional boundaries. The geographic scope of cumulative effects often extends beyond the scope of the direct impacts, but not beyond the scope of the indirect impacts of the proposed project and alternatives.

Timing and Duration of Implementation

Potential temporary (e.g., construction-related noise and vibration) and permanent (e.g., visible permanent structures) MPWSP impacts are considered in the cumulative impacts analysis if they could combine in space and time with similar impacts of cumulative projects identified in Table 4.1-2.

Because of the limited water supply available in the CalAm Monterey District, many development projects in the service area have been put on hold until supplemental supplies can be secured. As discussed in Chapter 2, Water Demand, Supplies, and Water Rights, there is a moratorium on new water service connections. Because of the moratorium, some of the reasonably foreseeable future projects may not be approved or built until the moratorium is lifted. Therefore, with the moratorium in place, the potential for simultaneous construction-related impacts is less likely. However, because the timing of construction for many cumulative projects is unknown, and because some of the cumulative projects may have water allocations, this analysis conservatively assumes that the incremental impacts of the construction, operation, and maintenance of some of these projects may overlap with those of the MPWSP. As a result, the cumulative impacts analysis and conclusions presented in each section may overstate some potentially cumulatively considerable impacts.

TABLE 4.1-2
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
Monterey County			
1	Salinas River near the City of Marina	**Salinas Valley Water Project Phase II –** The project would allow the Monterey County Water Resources Agency (MCWRA) to further offset groundwater pumping by delivering additional surface water to the Pressure and East Side subareas. The project would divert up to 135,000 acre-feet per year (afy) of water from the Salinas River for municipal, industrial, and/or agricultural uses in the Pressure and East Side subareas. Continued reductions in groundwater pumping through use of the diverted surface water would help combat seawater intrusion in Monterey County. The project proposes two new surface water diversion points and related facilities to capture, convey, and deliver the water. The capture and diversion facilities would consist of either a surface water diversion facility, similar to the Salinas River Diversion Facility, or subsurface collectors, such as radial arm wells. The conveyance facilities would be composed of pipelines and pump stations. The pipeline diameter, length, destination, number and location of turnouts, locations of pump stations, and physical layout of the conveyance facilities have not been determined. The delivery facilities may consist of injection wells for aquifer storage and recovery (ASR), percolation ponds, turnouts for direct use of the water, or other options. The design and location of the delivery facilities would depend on the type of facility, the end-users' intended application of the water (agricultural versus urban), and the need for water treatment (MCWRA, 2014). A Notice of Preparation to prepare an EIR was issued by MCWRA in June 2014, but a Draft EIR has not yet been prepared or published.	Construction start unknown; Project operation anticipated 2026
2	Former Fort Ord Military Base, East Garrison Area	**East Garrison Specific Plan** – Mixed-use development project comprising residential, commercial, office, institutional, and recreational uses on approximately 244 acres. The project includes the construction of up to 1,470 dwelling units, 75,000 square feet of commercial uses, 11,000 square feet of public and institutional uses, 100,000 square feet of art/cultural/educational uses, and approximately 50 acres of open space. Development under the Specific Plan will be implemented in three phases. (Michael Brandman Associates, 2004; FORA, 2013; East Garrison, 2015).	Ongoing / Full Build-out Scheduled for 2025
3	24491 Citation Court	**Laguna Seca Villas** – Construction of 20,306 square feet of professional office space on the Laguna Seca Office Park subdivision (Monterey County Planning Department, 2015, 2016a).	Unknown. Permit extended for three years in September 2015.
4	5 Corral De Tierra Road at Highway 68	**Omni Enterprises, LLC** – Development of a new 99,970-square-foot shopping center on 11 acres that includes retail and office space. Construction would start following demolition of an existing gas station on the site and cleanup of contaminated soils. (Monterey County Planning Department, 2016b; Monterey Herald, 2015).	Construction anticipated to begin in 2017.
5	South side of State Highway 68, between River Road and San Benancio Road	**Ferrini Ranch Subdivision** – Subdivision of an approximately 866-acre property into 212 residential lots, including 146 market rate single-family residential lots, 23 clustered market rate residential lots, and 43 lots for inclusionary housing units; three open space parcels of approximately 600 acres; and one agricultural-industrial parcel (Monterey County Planning Department, 2016e).	Unknown
33	Monterey County Water Resources Agency / Prunedale	**Granite Ridge Water Supply Project** – Includes a new 1,000 gallons per minute groundwater production well and associated backup well near Manzanita Regional Park, both drilled to a depth of up to 635 feet; up to 87,700 linear feet of 6- to 12-inch-diameter water transmission pipelines; two booster pump stations; two water storage tanks (350,000 and 250,000 gallons); and associated facilities. The project would consolidate existing water distribution infrastructure, including up to 119 existing water systems and 500 individual well users (MCWRA, 2010a; 2010b).	Unknown
24	Monterey County Water Resources Agency / southern Monterey County and northern San Luis Obispo County	**Interlake Tunnel -** The MCWRA Interlake Tunnel Project would build an 11,000-foot-long tunnel to divert approximately 50,000 afy of water from Nacimiento Reservoir to San Antonio Reservoir that would have otherwise been spilled at Nacimiento Dam. The Nacimiento River basin produces nearly three times the average annual flow of the San Antonio River basin. During the winter season, the Interlake Tunnel would transfer excess Nacimiento River flows to San Antonio Reservoir, thereby increasing the overall storage capacity of the system (MCWRA, 2016). The water stored in San Antonio Reservoir would then be used for downstream groundwater recharge and abatement of saltwater intrusion in the Salinas Valley Groundwater Basin (RWMG, 2014).	Construction anticipated to begin in early 2019 (MCWRA, 2017).

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
Monterey County (cont.)			
48	Congress Road and SFB Morse Drive, Pebble Beach	**Pebble Beach Company Inclusionary Housing Project –** The project would involve the construction of 24 affordable housing units, ranging in size from 1,078 square feet to 1,343 square feet (Monterey County Planning Department, 2016g).	Approved August 2016
49	Highway 68 at Corral de Tierra Road	**State Route 68/Corral de Tierra Road Intersection Improvement Project** – The project would widen the approaches to the Highway 68/Corral de Tierra Road intersection to accommodate a second left turn lane from westbound Highway 68 to southbound Corral de Tierra Road by shifting the through lane to the north. A second southbound receiving lane would also be built on Corral de Tierra Road departing the intersection to receive traffic from the second left-turn lane (Caltrans, 2015).	Construction anticipated to start fall of 2017 and be completed 2018
City of Sand City			
6	330 Shasta Street	**City of Sand City Coastal Desalination Plant** – This existing desalination facility can produce 300 afy of potable water supplies. Four seawater extraction wells pump brackish water to the plant, where reverse-osmosis technologies desalinate the water. Brine concentrate is disposed of by injecting the concentrate into a subsurface slant well beneath the coastal bluff (City of Sand City, 2016). Two additional extraction wells planned for installation in 2018 to maintain the appropriate level of TDS in the brackish feedwater supply.	Original facility completed in 2010; two new wells to be installed late 2018
19	Former Sand Mine site, near the Fremont / Highway 1 interchange.	**Monterey Bay Shores Resort** – The project consists of a 341-unit "eco-resort" on 39 acres approved. The proposal calls for 161 hotel rooms, 180 condominiums, a restaurant, conference center, spa, and three swimming pools (SNG, 2008).	Unknown
43	Redwood Avenue and John Street	**90-Inch Bay Avenue Outfall Phase 1 –** Improvement project involving: (1) installation of a discharge valve at the Bay Avenue outfall; (2) maintenance and manual breaching of the sand bar to allow gravity flow through the culvert; (3) creation of an infiltration basin at John Street and Redwood Avenue to mitigate flooding; (4) reconstruction of the existing elevated emergency outlet structure, including doubling the size of the box to increase the width of the emergency outlet structure; and (5) building a curb channel along the top of the existing 90-inch-diameter culvert from the emergency outlet to the check valve (MPWMD, 2014).	Unknown
56	Highway 1 between Tioga Avenue and Playa Avenue	**The Collection at Monterey Bay Resort** – Approved 340-room visitor-serving coastal resort on a 26.46-acre site located west of Highway and north of Tioga Avenue, that may be built in two phases. Phase I is a 135 hotel room on a 7.9-acre parcel known as the "Sterling" Site. Phase II is a coastal resort on the 16.25 acre "McDonald" site consisting of 205 visitor rooms, a restaurant with banquet facilities, a health/wellness spa, parking, and other related improvements. Primary access will be via Tioga Avenue for Phase I and Playa Avenue and an extension of Sand Dunes Drive for Phase II access. (Sand City, 2012)	Unknown
City of Marina			
7	Former Fort Ord Military Base Highway 2 / Imjin Parkway	**The Dunes on Monterey Bay** – Mixed-use development project comprising 1,237 residential units, 500 hotel rooms, and retail and office space on 297 acres. Phase 1 (378,000-square-foot retail center) built in 2007-2008. Phase 2 includes the following: (1) South County Housing to develop and build 108 low- and very low-income affordable apartments, many of which were completed by spring/summer 2014; (2) Cinemark multiple screen movie theater completed 2015; (3) Plans approved for two approximately 15,000 square foot retail buildings to be built near the movie theater; (4) Veterans Affairs Monterey Health Care Center located on a 14.31-acre project site within the Dunes on Monterey Bay Specific Plan area completed 2016; and (5) Springhill Suites, a 67,328-square-foot, 4-story hotel with 106 hotel rooms (under construction). The hotel includes a 1,750-square-foot meeting room and guest parking and is scheduled to open in April 2017 (City of Marina, 2015, 2016f; FORA, 2013; FORA, 2015; Marriott, 2016).	Under construction / Full Buildout Scheduled for 2020

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
City of Marina (cont.)			
8	Former Fort Ord Military Base 3rd Avenue / Imjin Parkway	**Cypress Knolls Senior Residential Project** – Senior residential community with active-adult housing, care services, senior community center, and supportive amenities and services on 188 acres (City of Marina, 2012; City of Marina, 2016b).	Unknown; project on hold
9	Former Fort Ord Military Base Imjin Parkway / California Avenue	**Marina Heights** – Removal of 828 abandoned residential units and replacement with a combination of 1,050 new townhouse, cottage, estate homes, and single-family residential units. The project also includes 35 acres of parks, greenbelts, and open space (City of Marina, 2010; City of Marina, 2016d).	Phase I Under Construction
10	Reservation Road between Del Monte Boulevard and De Forest Avenue	**Marina Downtown Vitalization Specific Plan** – Redevelopment plan for Marina's 225-acre downtown area comprising mixed-use commercial, residential, educational, and civic uses (City of Marina, 2011b; City of Marina, 2016c).	Unknown / Full Buildout Scheduled for 2040
11	Marina Airport Reservation Road / Blanco Road	**Marina Airport Economic Development Area** – Airport development project aimed at promoting growth of the airport. Individual projects include: • Airfield Electrical System Upgrades • Runway Rehabilitation and Extension • Taxiway Rehabilitation and Extension • Airfield NAVAIDS Improvements (City of Marina, 2011a; City of Marina 2016a).	Completed
39	3012-3032 Lexington Court, Marina (east of Abrams Drive on the former Fort Ord Military Base)	**Rockrose Gardens** – 20 units of permanent, affordable, supportive housing for people with psychiatric disabilities (FORA, 2013; FORA, 2015).	Completed
12	Armstrong Ranch, Marina (Along the northern limits of the city of Marina, on either side of Del Monte Avenue)	**Marina Station** – Development project comprising 1,360 residential units, approximately 60,000 square feet of retail space, 144,000 square feet of office space, and 652,000 square feet of business park/industrial uses. The 1,360 residential units comprise approximately 887 single-family lots and 473 multi-family units (City of Marina, 2011c; City of Marina, 2016e).	Unknown
13	California State University Monterey Bay Campus	**CSUMB North Campus Housing Master Plan** – Includes 583 student housing units, leasing office, community center on 8 acres (more recently known as the Promontory Housing Project) (City of Marina, 2015; FORA, 2013; FORA, 2015).	Competed
40	California State University Monterey Bay Campus (Divarty Street, east of General Jim Moore Boulevard)	**ITCD Academic Building (CSUMB) –** New 58,000-square-foot Information Technology and Communications Design (ITCD) and the School of Business academic building (FORA, 2013; CSUMB, 2016).	Completed
47	CEMEX Sand Mining Facility (east of Highway 1 on Lapis Road)	**CalAm Slant Test Well at CEMEX –** Construction and operation of a test slant well and associated monitoring wells. The project purpose is to develop the geologic, hydrologic, and water quality data needed to confirm the feasibility of using slant wells in the CEMEX active mining area as a Subsurface Intake System for the MPWSP Desalination Plant. The test slant well extends diagonally beneath the seafloor through the Dune Sand Aquifer and the 180-Foot Aquifer Equivalent and was originally permitted to operate until February 2018 (CCC, 2014) but that permit was extended to February 2019 (CCC, 2017). As explained in Chapter 3 and where relevant in Chapter 4 cumulative analyses, this test well would be incorporated into the proposed project for long-term operation; if the CPCN and MBNMS approval of the proposed project is denied, the test well would be removed consistent with the terms of the Coastal Development Permit.	April 2015 Construction completed, pilot program currently underway

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
City of Marina (cont.)			
63	CEMEX Sand Mining Facility (east of Highway 1 on Lapis Road)	**CEMEX Mining Area Removal Plan and Reclamation Plan –** Under the terms of the June 2017 Consent Cease and Desist Order (Settlement Agreement) between CEMEX, the California Coastal Commission, the California State Lands Commission, and the City of Marina, CEMEX, the owner and operator of the Lapis Sand Plant, agreed to cease and desist all sand mining operations and remove all physical structures and materials associated with the mining operations that are required to be removed by the Removal Plan, and to initiate the remaining activities required under the 1992 SMARA Reclamation Plan. Structures and facilities to be removed include the warehouse, bagging facility, screening facility, kiln factory, offices, scales, shops, wells, wet tower, dredge, anchors, mooring cables, pipelines, booster pump, and all associated equipment. Restoration of the affected area includes grading and seeding. (CCC, 2017)	Removal and reclamation activities must be completed by December 31, 2025.
City of Seaside			
14	West of Fremont Boulevard, along Broadway Avenue, Del Monte Boulevard, and Canyon Del Rey Boulevard	**The West Broadway Urban Village Specific Plan** – Mixed-use, transit-oriented development comprising residential with ground-floor retail and commercial uses along Broadway Avenue, with supporting future transit-oriented development along the west side of Del Monte Boulevard. Includes a public library and parking structure on Broadway Boulevard and a hotel/conference center mixed-use development at the southeast corner of Canyon Del Rey and Del Monte Boulevards (City of Seaside, 2016a).	Ongoing construction due to redevelopment plans
15	Broadway Avenue / Fremont Boulevard	**City Center Shopping Center Redevelopment Project** – Approximately 40,000 square feet of retail and restaurant space (City of Seaside, 2016c).	Construction completed in 2012
16	Former Fort Ord Military Base Monterey Road / Coe Avenue	**The Seaside Resort** – The first phase, completed in 2009, involved upgrades to the Bayonet and Black Horse Golf Courses. The next phase of development features a four-star hotel with approximately 275 hotel rooms, 175 timeshare units, and 125 residential units (City of Seaside, 2016c).	Stage 1 2017-2018
18	Former Fort Ord Military Base Between Highway 1 and 2nd Avenue, and Light Fighter Drive and 1st Street	**Main Gate Specific Plan** – Mixed-use development project featuring approximately 500,000 square feet of retail and entertainment space, and a 250-room hotel/conference center with spa amenities (City of Seaside, 2016b).	Unknown
41	Broadway Avenue between Del Monte Boulevard and Fremont Boulevard, and Del Monte Boulevard between Broadway Avenue and Contra Costa Street	**West Broadway Stormwater Retention** – The project involves construction of a stormwater treatment and diversion system in Broadway Avenue between Del Monte Boulevard and Fremont Boulevard and at Del Monte Boulevard. Treated water would be diverted to retention structures for groundwater recharge (MPWMD, 2014).	Unknown
42	Laguna Grande and Roberts Lake (Near the intersection of Highway 218 [aka Canyon Del Rey Boulevard] and Del Monte Boulevard)	**Dredge Laguna Grande and Roberts Lake**[6] – The project would create additional storage capacity, visitor-serving amenities, and habitat enhancements at Laguna Grande and Roberts Lake (MPWMD, 2014).	Unknown

6 Laguna Grande and Roberts Lake are collectively referred to as Laguna del Rey throughout this EIR/EIS.

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
City of Seaside (cont.)			
44	Broadway Avenue between Del Monte Boulevard and Fremont Boulevard and at Del Monte Boulevard	**Del Monte Blvd Dry Weather Diversion** – The project consists of a dry weather runoff diversion at Del Monte Boulevard to the sanitary sewer system. Diverted water would be treated by the regional treatment plant and reused for existing non-potable and potential future potable uses (MPWMD, 2014).	Unknown
City of Monterey			
20	459 Alvarado Street	**459 Alvarado Street** – Development of 36 residential units and 12,000 square feet of commercial uses (City of Monterey, 2012).	Completed in 2016
21	480 Cannery Row	**Ocean View Plaza** – Approved mixed-use development project comprising 87,362 square feet of commercial space, 30,000 square feet of restaurant space, 8,408 square feet of coastal/community use, 38 market-rate condominiums, and 13 inclusionary housing units (City of Monterey, 2012). As of 2015, the property had gone into default and was listed for sale.	Unknown
50	200 Iris Canyon Road	**Iris Canyon Residential Care Facility for the Elderly** – The project consists of a 110-unit/136-bed residential care facility with studios, one and two bedroom rental units and services with one 114,316 square foot main building and three 2,284 square foot duplex building. The project covers a total of 46,076 square feet and the total floor area is 121,168 square feet (CEQAnet, 2014).	Construction anticipated completion in 2017
51	Throughout the City of Monterey	**Sanitary Sewer System Rehabilitation Program** – The project involves fixing 441 sewer pipes and 516 sewer manholes located in the streets throughout the City of Monterey. Repairs would begin in early 2016 and continue for 18 months (City of Monterey, 2016).	Under construction
52	Highway 68 and 17 Mile Drive	**Holman Highway 68/Highway 1 Roundabout** – The project would build a roundabout at the intersection of Holman Highway 68 and 17 Mile Drive near the entrance to Pebble Beach. (TAMC, 2016b).	Under construction
City of Pacific Grove			
22	Sunset Drive	**Pacific Grove Local Water Project** – Construction of a new local satellite recycled water treatment plant at the former Point Pinos Wastewater Treatment Plant and installation of 1,400 linear feet of conveyance pipeline. Initially, the project would provide 125 afy of non-potable recycled water to serve irrigation needs at the Pacific Grove Golf Links and the El Carmelo Cemetery. Potential expansion could increase output to 600 afy (City of Pacific Grove, 2014; City of Pacific Grove, 2015).	2017
23	Pacific Grove	**Pacific Grove Recycled Water** – Recycled water from the Pebble Beach Community Services District (PBCSD) and raw wastewater from 500 homes in the Del Monte Park area of Pacific Grove would be captured and diverted to the existing Carmel Area Wastewater District (CAWD) reclamation facility for treatment. Recycled water from CAWD would be stored in the Forest Lake Reservoir and returned to the city through existing CAWD and PBCSD recycled water systems to a delivery point near the Spanish Bay Golf Course in Pebble Beach. Approximately 10,000 to 13,500 linear feet of new 12-inch diameter recycled water pipeline would be built to deliver water to the golf links, cemetery and other irrigation demands (CPUC, 2012).	Unknown
City of Carmel			
25	2770 15th Avenue, Carmel	**Carmel Unified School District** – Construction of a 5,070-square-foot building to house six classrooms. The project also includes the removal of five onsite temporary modules and six non-native ornamental landscape trees (Monterey County Planning Department, 2016c).	Construction Complete
26	Del Monte Forest	**Pebble Beach Company Project** – The project builds out and preserves the remaining undeveloped Pebble Beach Company properties located within the Del Monte Forest. The project would renovate and expand visitor-serving uses, create 90 to 100 single-family residential lots, and preserve 635 acres as primarily forested open space. The proposed development would result in new construction at four primary sites: The Lodge at Pebble Beach, The Inn at Spanish Bay, Spyglass Hill, and the Pebble Beach Equestrian Center (Monterey County Planning Department, 2016f).	Unknown

**TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS**

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
City of Carmel (cont.)			
27	Carmel Valley Road	**Rancho Cañada Village Specific Plan** –A previous proposal included 281 housing units. A recirculated Draft EIR analyzes a 130-Unit Alternative that would reduce the total number of residential units to fit within the 190-unit housing cap negotiated between the Carmel Valley Association and Monterey County as part of a 2010 general plan lawsuit settlement, The Ranch Canada Village would be built within the current west course of the Rancho Canada Golf Club. (Monterey County Planning Department, 2016h).	Unknown. Recirculated DEIR
28	Carmel Valley Road	**Rancho Cañada Golf Club East Course Closure** – Closure of the Rancho Canada Golf Club's east course and transfer of 140 acres of land to the Monterey Peninsula Regional Park District. Tentative plans for the land include additional parking and access to Palo Corona Regional Park, hiking trails, and restored riparian habitat (The Trust for Public Land, 2016; The Carmel Pine Cone, 2016).	East Course closure to occur in 2017. Restoration work schedule unknown.
Monterey Peninsula Water Management District			
29	Former Fort Ord Military Base General Jim Moore Boulevard/ Eucalyptus Boulevard	**Seaside Groundwater Basin Aquifer Storage and Recovery (Phase 1)** – Water supply project consisting of two injection/extraction wells (ASR-1 and ASR-2 wells), a backwash percolation basin, a chemical/electrical building, and conveyance pipelines. During high-flow periods in the Carmel River, river water is injected into Seaside Groundwater Basin, then extracted during dry periods or periods of high demand (MPWMD, 2005).	Construction completed in 2008
30	Seaside Middle School General Jim Moore Boulevard/ Coe Avenue	**Seaside Groundwater Basin Aquifer Storage and Recovery (Phase 2)** – This phase includes two additional injection/extraction wells (ASR-2 and ASR-3 wells) and a backwash percolation basin (Denise Duffy & Associates, 2012).	Construction completed in 2014
Monterey Regional Water Pollution Control Agency			
59	(With Monterey Peninsula Water Management District) MRWPCA Regional Wastewater Treatment Plant	**Pure Water Monterey Groundwater Replenishment (GWR) Project** – The MRWPCA certified the Final EIR and approved the GWR project in October 2015; an Addendum was prepared and adopted in October 2017. The GWR facilities would collect a variety of source waters from several locations in Monterey County and convey that water to the MRWPCA Regional Wastewater Treatment Plant for treatment. The GWR project would then purify 5 mgd of water at a new Advanced Water Treatment Plant located at the existing wastewater treatment plant site, and convey and then inject 3,500 afy of the purified water into the Seaside Groundwater Basin for later extraction by CalAm for delivery to CalAm customers. The GWR facilities also would provide an average of 4,750 afy of recycled water for agricultural irrigation in northern Monterey County through the CSIP and 600 afy to MCWD for urban irrigation. The new source waters for the GWR project would supplement the existing incoming wastewater flows, and would include the following: 1) water from the City of Salinas agricultural wash water system, 2) stormwater flows from the southern part of Salinas and the Lake El Estero facility in Monterey, 3) surface water and agricultural tile drain water that is captured in the Reclamation Ditch and Tembladero Slough, and 4) surface water and agricultural tile drain water that flows in the Blanco Drain. The GWR project would include new pipelines and injection facilities. In September 2016, the CPUC approved a Water Purchase Agreement that allows CalAm to secure 3,500 afy of water from the GWR project to meet a portion of the project water supply needs. The GWR Project is a cumulative project in the context of Alternatives 5a and 5b, which evaluate a reduced-size (6.4-mgd) desalination plant at the Project and an Alternate site, as well as Alternative 3. This project is not considered a cumulative project for the Proposed Project, Alternatives 1 and 2 because both CalAm and the People's Project would not build a full-capacity desalination facility should GWR be completed. The GWR project is a cumulative project with the DeepWater Desal project because that project is sufficiently large and designed to serve customers in myriad geographic locations such that it could proceed even if the GWR project is implemented.	Construction anticipated complete in 2018

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
Monterey Regional Wastewater Pollution Control Agency (cont.)			
61	Existing Outfall, Beach Junction Structure	The existing Beach Junction Structure and a portion of the existing outfall became exposed on the beach during the winter 2015/16 storms. Under an order from the California Coastal Commission, the MRWPCA is required to replace the exposed components, independent from and as a project separate from the MPWSP. The MRWPCA proposes to re-locate the junction structure inland by 650 to 1,000 feet and install 650 to 1,000 feet of new 60-inch diameter outfall pipe on the westward (ocean) side of the junction box, which would connect to the existing ocean outfall. That project would include using pre-lined pipe to protect the new portion of the outfall from corrosion that would be caused by the proposed MPWSP brine.	Construction anticipated complete in 2020
Other			
32	Carmel River near confluence with San Clemente Creek	**CalAm San Clemente Dam Removal Project** –This project removed the 106-foot-tall San Clemente Dam that used to be on the Carmel River, rerouted the Carmel River into San Clemente Creek, excavated and stabilized sediment that had accumulated in San Clemente Creek, and restored a half-mile reach of San Clemente Creek (San Clemente Dam Removal, 2016).	Construction completed in 2015
34	Moss Landing / Santa Cruz County	**Monterey Bay Regional Water Project (MBRWP or DeepWater Desal)** – This project includes a 23 mgd seawater desalination facility and co-located 1 million-square-foot data center on a 110-acre site in Moss Landing, on Dolan Road, approximately 1,500 feet east of the Moss Landing Power Plant. The project would serve up to 25,000 afy of potable water supply to participating communities in the Monterey Bay region, potentially including the Monterey Peninsula, Castroville, Salinas, and parts of Santa Cruz County (DeepWater Desal, 2015). As proposed by DeepWater Desal, the project would develop supplemental water supplies to serve the customers in CalAm's Monterey District service area. However, if the MPWSP is built, DeepWater Desal can provide water to other areas, as described above. Therefore, this EIR/EIS considers two reasonably foreseeable scenarios that include development of the DeepWater Desal Project: 1) Development of the DeepWater Desal Project as an alternative to the MPWSP, as described in Chapter 5 (serving CalAm's Monterey District service area). This is Alternative 3 described and analyzed in Chapter 5. 2) Development as a separate project in addition to the MPWSP or another alternative that would serve CalAm's Monterey District service area. In this case, the impacts of the DeepWater Desal Project are considered in the cumulative scenario as they relate to the provision of water to Santa Cruz County and the City of Salinas. The DeepWater Desal Project with provision of water to Santa Cruz County and the City of Salinas is a reasonably foreseeable project in the cumulative scenario relevant to the proposed project and Alternatives 1, 2, 4, and 5a and 5b.	Beyond 2017
57	Moss Landing Green Commercial Park/ Santa Cruz County	**People's Moss Landing Water Desal Project** – The 12 mgd desalination project would provide 13,400 afy of desalinated water supply to meet the current and future needs of the Monterey Peninsula area. The People's Project applicant has used CalAm's required need for replacement supplies and water needs of the General Plan Build-out and/or the water demands of North Monterey County to size this alternative. The project would rehabilitate existing pipelines for an open-water intake and the discharge of effluent, a new pump house, desalination plant, and desalinated water conveyance and storage facilities (Moss Landing Harbor District, 2015). As proposed by its applicant, the People's Project would develop supplemental water supplies to serve customers in CalAm's Monterey District service area and North Monterey County. Since the People's Project and the MPWSP would not both be implemented to serve the same customers, this EIR/EIS assumes the People's Moss Landing Project is an alternative to the MPWSP (see Chapter 5, Alternative 4). Therefore, it is not a reasonably foreseeable project in the cumulative scenario relevant to the MPWSP. It would also not be a reasonably foreseeable project in the cumulative scenario for any of the alternatives aimed at meeting the objectives of the MPWSP. Therefore, although acknowledged here as a reasonably foreseeable alternative to the proposed project (as described in Chapter 5), this project's contributions to cumulative impacts are not considered as part of the cumulative scenario relevant to the proposed project or another alternative.	Unknown

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
Marina Coast Water District			
31	Marina Coast Water District, Monterey County	**Regional Urban Water Augmentation Project (RUWAP) Desalination Element** – On March 1, 2016, in response to a request for information, MCWD stated that the RUWAP Desalination Plant would produce up to 2,700 acre-feet per year (AFY) of potable water supply; 2,400 AFY would be for the former Fort Ord, as identified in the Fort Ord Reuse Authority (FORA) Base Reuse Plan (BRP) and 300 AFY would be for the District's Central Marina service area, as a replacement for the existing pilot (non-operating) desalination plant (MCWD, 2016). However, MCWD reported that the water source for the proposed desalination project has not yet been determined; it may be seawater-intruded groundwater from the 180-Foot Aquifer, or it may be seawater from shallow wells located along the coast. The location of the wells and pipelines must also be addressed in a feasibility study. The desalination plant site last studied was located in North Marina on a parcel owned by MCWD, adjacent to the MRWPCA Regional Wastewater Treatment Plant. In any event, a feasibility study is needed to determine the actual component sizes and the timing of this project is dependent upon the redevelopment water demands within the former Fort Ord. Subsequent to that March 2016 response, the MCWD Board of Directors adopted by unanimous vote on May 2, 2016, Resolution 2016-26 approving a Memorandum of Understanding regarding Fort Ord water augmentation and a three party effort (MCWD, FORA and MRWPCA) to study alternatives. The resolution was prompted by the MCWD and MRWPCA entering into an agreement dated April 8, 2016 for the joint Pure Water Delivery and Supply Project, which will provide 1,427 AFY, leaving an unmet need for 973 AFY to support the FORA BRP. The three party planning (TPP) effort will explore the most cost effective and technically efficient mix of advanced treated water, conservation, desalination, groundwater recharge and recovery, and other water sources, options, and alternatives to provide the 973 AFY of augmented water, and whether more or less than 1,427 AFY of advanced treated water is necessary to serve the Ord Community. The FORA Board will utilize the TPP study in developing a preferred water augmentation mix and deciding which additional water augmentation project(s) should be developed by MCWD. Based on these current events and actions, it is speculative to assume that MCWD will implement a 2,700 AFY desalination facility, or what the size, timing or configuration of that facility will be. This EIR/EIS thus does not generally include the RUWAP Desalination Plant. Making conservative assumptions, however, Section 4.4, Groundwater Resources, does analyze as a cumulative project the development of a 1,000 AFY desalination plant on MCWD land in the event that such an option is chosen to make up the shortfall needed to provide a total of 2,400 AFY of water augmentation to support the FORA BRP.	Unknown
35	Marina Coast Water District, Monterey County	**Regional Urban Water Augmentation Project (RUWAP) Recycled Water Project** – The Recycled Water Project includes construction of a recycled water distribution system to provide up to 1,727 afy of recycled water to urban users in the MCWD service areas, including the former Fort Ord. The water would be recycled at the existing Salinas Valley Reclamation Plant. This project includes the following facilities: a new pipeline connection to the Salinas Valley Reclamation Plant; one pump station; 40,000 linear feet of distribution pipelines; and a 2-million-gallon storage tank known as Blackhorse Reservoir. MCWD now proposes to combine conveyance facilities with the approved Pure Water Monterey Project for a shared pipeline (MCWD, 2016a).	August 2017 through September 2018
Moss Landing			
37	Moss Landing	**Moss Landing Community Plan** – Revised draft plan issued May 2015: • Revx-173 LLC – Demolition of an existing facility and construction of a 70,000-square-foot industrial warehouse on 189 acres. • Monterey Bay Aquarium Research Institute – Removal of a finger pier; construction of a 58,655-square-foot research facility; demolition of an existing building and construction of a 34,000-square-foot replacement facility; and construction of a 30-foot dock extension (Monterey County Planning Department, 2013). In addition, construction of a 66,500-square-foot building to support science and engineering research activities. • 30-Unit Hotel	Unknown

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
Moss Landing (cont.)			
37 cont.		• Pisto Restaurant – Construction of a 6,000-square-foot restaurant • Moss Landing Marine Laboratories – Development of a 36,000-square-foot warehouse and 15,000-square-foot dock/wharf area at 7539 Sandholdt Road. At 7544 and 7722 Sandholdt Road, development of a 2,600-square-foot mixed-use facility, a 7,400-square-foot research building, 8,520-square-foot concrete slab for aquaculture, and a 300-foot pier. • Gregg Drilling – Development of an 8,000- to 9,000-square-foot building for high-tech operations (Monterey County Planning Department, 2015).	
62	Moss Landing	**Moss Landing Power Plant Retrofit** – Through a settlement agreement executed on October 9, 2014 between the SWRCB and the current owner of the power plant, the Moss Landing Power Plant must reduce its intake of cooling water to meet an 83.7 percent or greater reduction in mortality from entrainment and impingement impacts beginning with reductions on December 31, 2016 and achieving full compliance by December 31, 2020. The Moss Landing Power Plant owner has indicated its intention to retrofit the power plant's four generating units to reduce entrainment and impingement impacts in compliance with the Once-Through-Cooling (OTC) policy and this would likely occur prior to the operation of any desalination project in Moss Landing.	Began in 2016, full compliance by end of 2020
Castroville			
36	Transportation Agency for Monterey County Between Salinas Street and Castroville Boulevard	**Castroville Bicycle and Pedestrian Overcrossing** – The project would build a bicycle and pedestrian path connecting the Community of Castroville to Castroville Boulevard. The project starts on Salinas Street at McDougall and parallels Axtell Street with an overcrossing at the Union Pacific tracks and a Class 1 path to Castroville Boulevard. The overcrossing structure would be approximately 1,400 feet long (TAMC, 2016a)	Construction anticipated to start in 2016
53	Caltrans Highway 156 between Castroville Boulevard and U.S. 101	**Route 156 West Corridor Project** – The project would build a new four-lane highway parallel to the existing Highway 156 with new interchanges built at Castroville Boulevard and at U.S. 101. The current two-lane highway would be converted into a frontage road serving the local community. A supplemental Environmental Impact Report is in preparation (TAMC, 2016c).	Unknown
Other Projects			
45	Cities of Monterey and Pacific Grove (David Avenue Reservoir, Pine Avenue, Ocean View Boulevard, former wastewater treatment plant site)	**Monterey-Pacific Grove Area of Special Biological Significance (ASBS) Stormwater Management Project** – The project includes diverting both wet weather and dry weather flows from the Greenwood Park and Congress Storm Drain Watersheds to the David Avenue Reservoir site, and treating and delivering of recycled water to irrigation sites throughout the city (CPUC, 2012). The project also revises the existing storm drain system in Pacific Grove to retain or treat stormwater flows. These retention facilities will help to meter or treat flows into either treatment facility thereby allowing up to a 90 percent reduction in pollutant loading during storm events. Diverted flows would ultimately be directed to either the rebuilt Pacific Grove Water Treatment Plant or the Monterey Regional Water Pollution Control Agency Regional Water Treatment Plant in Marina (MPWMD, 2014).	2018-2020
38	Cities of Castroville, Marina, Monterey, Seaside, Sand City, and County of Monterey.	**TAMC Monterey Peninsula Light Rail Project** – Construction of commuter light rail service, mostly along the Transportation Agency for Monterey County's (TAMC's) existing Monterey Branch Line right-of-way, from House Plaza in the city of Monterey to Blackie Road in Castroville. This 15.2-mile-long project would involve improvements to existing rail, construction of new rail, and 12 new stops (one in Castroville, five in Marina, three in Seaside and Sand City, and three in the city of Monterey). Approximately 860 new parking spaces would be built at these stations. The project would also include a new maintenance facility; this facility would be located at one of three sites, all of which are near Highway 1 on lands formerly associated with the Fort Ord military base (TAMC, 2011). TAMC has placed this project on hold indefinitely until the agency can secure funding for environmental review, design, and construction.	Unknown

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
Other Projects (cont.)			
46	Fort Ord Dunes State Park (immediately west of the TAMC rail corridor and State Highway 1, west of the former Fort Ord Military Base)	**Fort Ord Dunes State Park Campground** – Construction and operation of a campground facility and associated infrastructure within Fort Ord Dunes State Park, including 45 RV sites and two host sites with electrical and water hookups, 10 hike/bike sites, and 43 tent sites; parking for 40 vehicles; restrooms with showers; a multi-purpose building; an outdoor campfire center; interpretation/ viewing areas; renovated bunkers; an entrance station near the 1st Street underpass; modular structures; storage yard and maintenance shop; improved beach access/trails; one plumbed restroom with outdoor shower for beach use; a 200-foot wildlife/habitat corridor; internal campground trail network, trail improvements, and roadway improvements; and offsite utilities (Denise Duffy & Associates, 2013).	Unknown
54	California State University Trustees Colonel Durham Street and 6th Avenue	**Monterey Bay Charter School New School Project** – Phase I includes the construction of 19 K-8 classrooms; work rooms for administrators, teachers and custodians; resource and remedial instruction rooms; and storage. Phase II includes additional support facilities. Phase I is projected to accommodate approximately 430 students; full enrollment of 508 students is expected to be reached by Phase II (Denise Duffy & Associates, 2016).	Phase I construction anticipated 2018. Phase II construction anticipated 2020
55	Monterey Regional Waste Management District 14201 Del Monte Boulevard, Marina	**Monterey Regional Waste Management District Truck Yard Facility Project** – The project would include a 7,200-square-foot office/ administration building, a 11,300-square-foot maintenance building, a 5,000-square-foot truck wash and repair building, as well as collection truck parking and steel bin storage areas, Compressed Natural Gas equipment, and associated employee parking (Denise Duffy & Associates, 2014).	Construction underway
58	Monterey Regional Waste Management District 14201 Del Monte Boulevard, Marina	**Landfill-Gas-to-Energy Facility Phased Capacity Improvements** – Although it is not evaluated in this EIR/EIS, CalAm is actively pursuing a renewable energy source option with Monterey Regional Waste Management District (MRWMD) that would allow CalAm to meet a portion of the MPWSP Desalination Plant operational energy requirements with methane gas from the existing MRWMD landfill-gas-to-energy (LFGTE) facility located adjacent to the MPWSP Desalination Plant site. The MRWMD LFGTE facility produces 5.07 megawatts (MW) of continuous electricity that is sold to PG&E. MRWMD wishes to increase the electric generation capacity of the LFGTE facility by 3.2 MW in two stages, with the first phase of improvements increasing the capacity by 1.6 MW, followed by an additional 1.6 MW increase in 6 to 8 years. Once such an expansion were complete, the total generation capacity of the LFGTE facility would be 8.27 MW (ESI, 2014). If this renewable energy source option were implemented, about half of the MPWSP Desalination Plant operational energy requirements could be met with methane gas from the LFGTE facility; the remainder would come from the local PG&E grid. Overhead powerlines, electrical transformers, metering devices, and switchgear would be needed to connect the MRWMD LFGTE facility with the MPWSP Desalination Plant. Implementation of this option and the construction of the associated interconnection improvements would require separate environmental review. These possible LFGTE improvements have not been proposed and are not actively under environmental review and consideration; for these reasons, they are not evaluated in the cumulative analyses in this EIR/EIS.	Phase 1: Unknown Phase 2: 6 to 8 years after Phase 1
60	Cities of Seaside, Monterey, and Pacific Grove	**Monterey Pipeline and ASR Pump Station** – The new 5.4-mile-long, 36-inch-diameter Monterey Pipeline would allow for bi-directional flows and would convey potable water supplies from the GWR project (No. 59) to the Monterey Peninsula. The Monterey Pipeline would utilize the pressure (called "hydraulic head") provided by CalAm extraction operations to convey water to the Monterey Peninsula cities. The Monterey Pipeline would connect two pressure zones in the CalAm system (one in the area of the City of Pacific Grove and one in the area of the City of Seaside). Water stored in Forest Lake Tanks could flow via gravity to the lower Carmel Valley or be pumped to the upper Carmel Valley. In September 2016, the CPUC approved the Monterey Pipeline and ASR Pump Station along with the Water Purchase Agreement described for the GWR Project (No. 59). The MPWMD approved a Water Distribution System Permit and Pipeline Alignment modification that included the approval of two addenda to the Pure Water Monterey GWR Project Final EIR.	Under construction

NOTES: Project 17, Monterey Downs and Horse Park and Central Coast Veteran's Cemetery Specific Plan, is no longer being considered by the planning agency.

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205335.01 Monterey Peninsula Water Supply Project

Figure 4-1
Cumulative Projects

NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

SOURCE: ESA, 2013

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4.2 Geology, Soils, and Seismicity

Sections

Figures	Tables
4.2-1 Geologic Map of Project Area	4.2-1 Summary of Geologic Units and Project Component Locations
4.2-2 Generalized Geologic Cross-Section	4.2-2 Modified Mercalli Intensity Scale
4.2-3 Local Geologic Cross-Section	4.2-3 Active and Potentially Active Faults
4.2-4 Active and Potentially Active Regional Faults	4.2-4 Summary of General Soil Properties
4.2-5 Liquefaction Potential	4.2-5 Summary of Estimated Peak Ground Accelerations at Proposed Facility Locations
4.2-6 Landslide Hazard Map	4.2-6 Applicable Regional and Local Plans and Policies Relevant to Geology, Soils, and Seismicity
4.2-7 Representative Profile at Test Slant Well	4.2-7 Summary of impacts – Geology, Soils, and Seismicity
4.2-8 Representative Profile at Proposed Slant Wells	4.2-8 Comparison of Jet Plume and Ambient Ocean Currents at Monterey

This section evaluates the potential for construction and operation of the Monterey Peninsula Water Supply Project (MPWSP or proposed project) to result in adverse impacts associated with geologic, soils, and seismic hazards, including faulting, seismically-induced ground failures (e.g., landslides, liquefaction), erosion, expansive or corrosive soils, and coastal retreat. The analysis is based on review of available geologic and geotechnical maps and reports of the project area and vicinity, including reports and information published by the U.S. Geological Survey (USGS) and the California Geological Survey (CGS), the *Monterey County General Plan*, and site-specific investigations conducted for various project components.

Comments received on the April 2015 Draft EIR requested analysis of the slant wells electrical panel (see Section 4.2.5.2, Impact 4.2-10), and clarifications regarding geologic units and soils (see Section 4.2.1.1), LCPLUP Planning Guidelines (see Section 4.2.2.3, Local Regulations), slant well angles (see Section 3.2.1 in Chapter 3, Description of the Proposed Project), the slant well abandonment mitigation measure (see Section 4.2.5.2, Impact 4.2-10), subsidence (see Section 4.2.5.2, Impact 4.2-8), corrosion prevention measures (see Section 4.2.5.2, Impact 4.2-7), and the Reliz (Blanco Section) fault (see Section 4.2.1.2, Seismicity and Faults).

As a result of comments received on the January 2017 Draft EIR/EIS, revisions have been made to this EIR/EIS section. Those changes include:

- *Revisions to Mitigation Measure 4.2-10 (formerly 4.2-9), Slant Well Abandonment Plan, to include reporting requirements, coordination with the property owner, and consideration of the snowy plover nesting season.*

- *Addition of Secondary Impacts of Mitigation Measure 4.2-10, which would be similar to the impacts associated with other project-based construction activities.*

4.2.1 Setting/Affected Environment

The study area for the evaluation of impacts on geology, soils, and seismicity includes the project components and general vicinity, except for the issue of coastal erosion where the study area extends south from the slant well locations to include the sandy beaches of southern Monterey Bay. The study area includes the submerged lands of Monterey Bay National Marine Sanctuary (MBNMS), as the proposed slant wells would extend under the seabed in MBNMS.

4.2.1.1 Geologic Conditions

Topography

Figures 3-2 through **3-15** in Chapter 3, Description of the Proposed Project, show the locations of the proposed MPWSP components, which extend approximately 18 miles, from the connection to the Castroville Community Services District (CCSD) water distribution system located in unincorporated Monterey County in the north to the unincorporated community of Hidden Hills along Highway 68 in the south. In addition to unincorporated areas, project components are also proposed in the cities of Monterey, Marina, and Seaside. Although the topography of the project area is variable, the majority of the project components would be constructed in coastal dune areas or in low-lying inland areas within 2 miles of the coast.

The northern and coastal dune areas are characterized by gently to moderately rolling dunes with elevations ranging from sea level at the coast to 100 feet above mean sea level (msl) at the proposed MPWSP Desalination Plant. Along the shoreline, the coastal dune slopes can be steep and have a high potential for erosion (Ninyo & Moore, 2005, 2014). East of the coastline, the dune deposits have gentle slopes (0 to 10 percent) with increased stability and vegetation cover. Fill embankments up to approximately 30 feet high are located throughout the area with road cuts up to approximately 20 feet high within the dune sands. West of the coastline, the existing MRWPCA ocean outfall pipeline extends about 2.1 miles into waters of MBNMS to a depth of about 90 to 110 feet below mean sea level. The bathymetry[1] in the vicinity of the MRWPCA outfall structure is relatively flat with an average slope of 1 percent to the west of the diffuser for 5 miles. The rim of the Monterey Submarine Canyon, one of the deepest submarine canyons on the west coast of the United States, is less than 4 miles to the northwest of the proposed location of the slant wells at the CEMEX facility.

The topography of the more urbanized southern coastal portion of the project area ranges from rolling coastal dunes to older, more stable dunes and terrace deposits. The topography in this portion of the project area varies, and elevations range from 0 feet msl at the coast to about 340 feet above msl at the proposed ASR injection/extraction wells (ASR-5 and ASR-6 Wells).

The proposed Ryan Ranch–Bishop Interconnection Improvements and Main System-Hidden Hills Interconnection Improvements would be located 3 and 6 miles southeast of the coastline in a

[1] National Oceanic and Atmospheric Administration (2014) refers to bathymetry as the ocean's depth relative to sea level, although it has come to mean "submarine topography," or the depths and shapes of underwater terrain.

relatively rugged mountainous area with elevations of about 200 and 1,000 feet above msl, respectively. The proposed location for the Carmel Valley Pump Station is on the south side of Carmel Valley Road about 3 miles east and inland of the coastline at an elevation of about 80 feet above msl.

Regional Geology

The study area lies within the geologically complex region of California referred to as the Coast Ranges Geomorphic Province.[2] The Coast Ranges province lies between the Pacific Ocean and the Great Valley Geomorphic Province (Sacramento and San Joaquin Valleys) and stretches from the Oregon border to the Santa Ynez Mountains near Santa Barbara. This province is marked by northwest-trending elongated ranges and narrow valleys that roughly parallel the coast and the San Andreas Fault Zone. Much of the Coast Ranges province is composed of marine sedimentary deposits, metamorphic rocks, and volcanic rocks. The project area is also underlain by the "Salinian Block," a continental fragment of the granitic Sierra Nevada that was pushed northward by tectonic forces along the western side of the San Andreas Fault Zone (Tavarnelli, 1998). The tectonics of the San Andreas Fault and other major faults in the western part of California have played a major role in the geologic history of the area. The drainages south of San Francisco Bay are strongly influenced by tectonic-related faults and folds that typically trend parallel to the coast, although some drainages run perpendicular to the coast. The Salinas River, whose course largely lies within a synclinal trough,[3] exemplifies this pattern.

The Santa Lucia Range, the Salinas Valley, and the Santa Cruz Mountains are the prominent geologic features of the region. The rugged Santa Lucia Range generally runs from the Monterey Peninsula southeast to San Luis Obispo; the proposed Ryan Ranch–Bishop and Main System-Hidden Hills Interconnection Improvements, and the Carmel Valley Pump Station would be located in this area. The Salinas Valley is northeast of the Santa Lucia Range and roughly parallels these northwest-southeast-trending mountains. The geologic development of the Salinas Valley, which runs from Monterey Bay southeast into San Luis Obispo County, is largely the result of folding, although the valley also shows characteristics of stream erosion and faulting. The subsurface slant wells, MPWSP Desalination Plant, improvements to the Seaside Groundwater Basin ASR System and conveyance pipelines would be constructed within the Salinas Valley. The Santa Cruz Mountains extend from the San Francisco Peninsula south to the Pajaro River, near Watsonville, where they merge with the Gabilan Range. These mountains help define the northern end of Monterey Bay.

Geologic Units

The discussion of geologic units is based on the geologic mapping compilation prepared by the CGS (2002b; which is based largely on Clark et al. [1997] and Dupre and Tinsley [1980]); geotechnical field reconnaissance conducted in June and November 2004 during which various geologic units within the project area were observed and described (Ninyo & Moore, 2005); and

[2] A geomorphic province is an area that possesses similar bedrock, structure, history, and age. California has 11 geomorphic provinces (CGS, 2002a).

[3] A syncline or synclinal trough is a geologic feature where stratified bedrock has been folded into a concave upward form.

subsurface investigations consisting of soil borings and analytical testing at the proposed (CEMEX facility) and alternate (Potrero Road parking area) slant well locations (Geoscience, 2016). **Figure 4.2-1** presents the regional surface geology from the CGS's compilation for the project area. **Figure 4.2-2** presents a north to south regional geologic cross-section along the coast (HydroMetrics, 2009). **Figure 4.2-3** presents a west to east local geologic cross section extending from the coastline, through the proposed slant wells, and to about 2 miles inland.

The Salinas Valley extends about 80 miles inland and is filled with recent to Tertiary (65 million years ago [mya] to 1.6 mya) river and estuary deposits of the current and ancestral Salinas River and regional eolian[4] and marine sediments over the Mesozoic Salinian Block granitic basement (Kennedy Jenks, 2004). Based on a review of geologic literature combined with the field observations, it is expected that fill, active and older coastal dune sands, and terrace deposits would be encountered during construction of the project components. Deeper subsurface geologic units that were not encountered at the surface but are known to be present in the project area include the Aromas Sand, Paso Robles Formation, Purisima Formation, Santa Margarita Formation, and Monterey Formation, as well as an underlying, unnamed sandstone and the granodiorite[5] of the Salinian Block.

Table 4.2-1 summarizes the geologic units and the project components, which are discussed below.

TABLE 4.2-1
SUMMARY OF GEOLOGIC UNITS AND PROJECT COMPONENT LOCATIONS

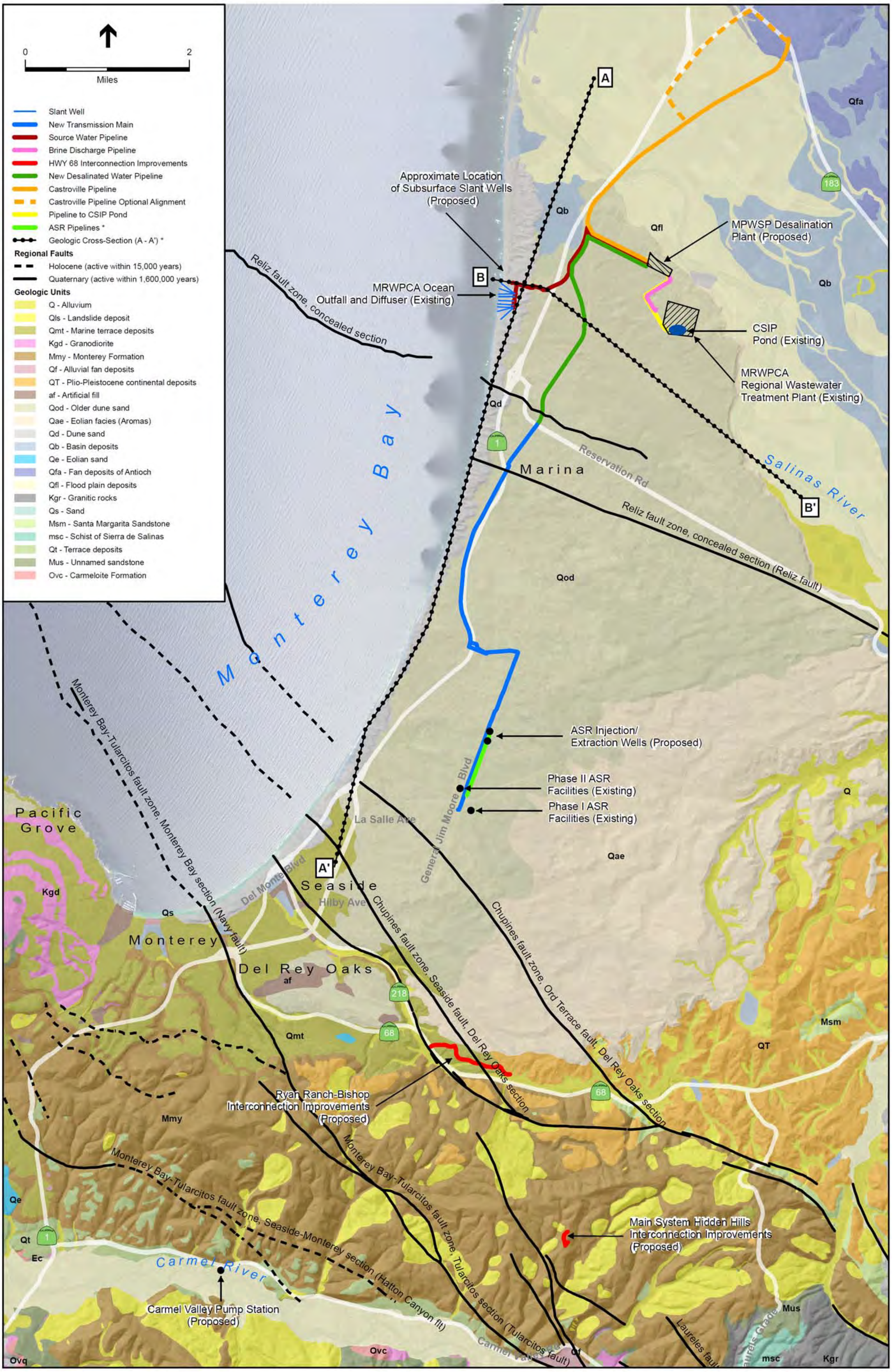
Geologic Unit	Project Component
Fill	Some pipeline segments
Dune Sands	Subsurface slant wells; westernmost portion of Source Water Pipeline
Older Dune Sands	Subsurface slant wells; most pipeline segments; MPWSP Desalination Plant; Castroville Pipeline, all ASR facilities along General Jim Moore Boulevard
Floodplain Deposits	Castroville Pipeline
Terrace Deposits	Subsurface slant wells; portions of the Ryan Ranch–Bishop Interconnection Improvements
Carmel Valley Floodplain	Carmel Valley Pump Station
Aromas Sand	ASR-5 and ASR-6 Wells[a]
Paso Robles Formation	ASR-5 and ASR-6 Wells[a]
Purisima Formation	ASR-5 and ASR-6 Wells[a]
Santa Margarita Formation	ASR-5 and ASR-6 Wells[a]
Monterey Formation	Main System–Hidden Hills Interconnection Improvements

NOTES:

[a] The ASR-5 and ASR-6 Wells would be drilled through the Aromas Sand, Paso Robles, and Purisima Formations, and screened in the Santa Margarita Formation.

SOURCE: CGS, 2002b

4 Eolian deposits are borne, deposited, produced, or eroded by wind.
5 Granodiorite is a granular, igneous rock intermediate between granite and quartz-diorite. Igneous rock is produced by fire, great heat, or the action of a volcano, and has been solidified from a molten state.



205335.01 Monterey Peninsula Water Supply Project

Figure 4.2-1
Geologic Map of Project Area

NOTE:
*Refer to figure 4.2-2 for "A" geologic cross-section information and 4.2-3 for "B" geologic cross-section information.

SOURCE: CGS, 2002

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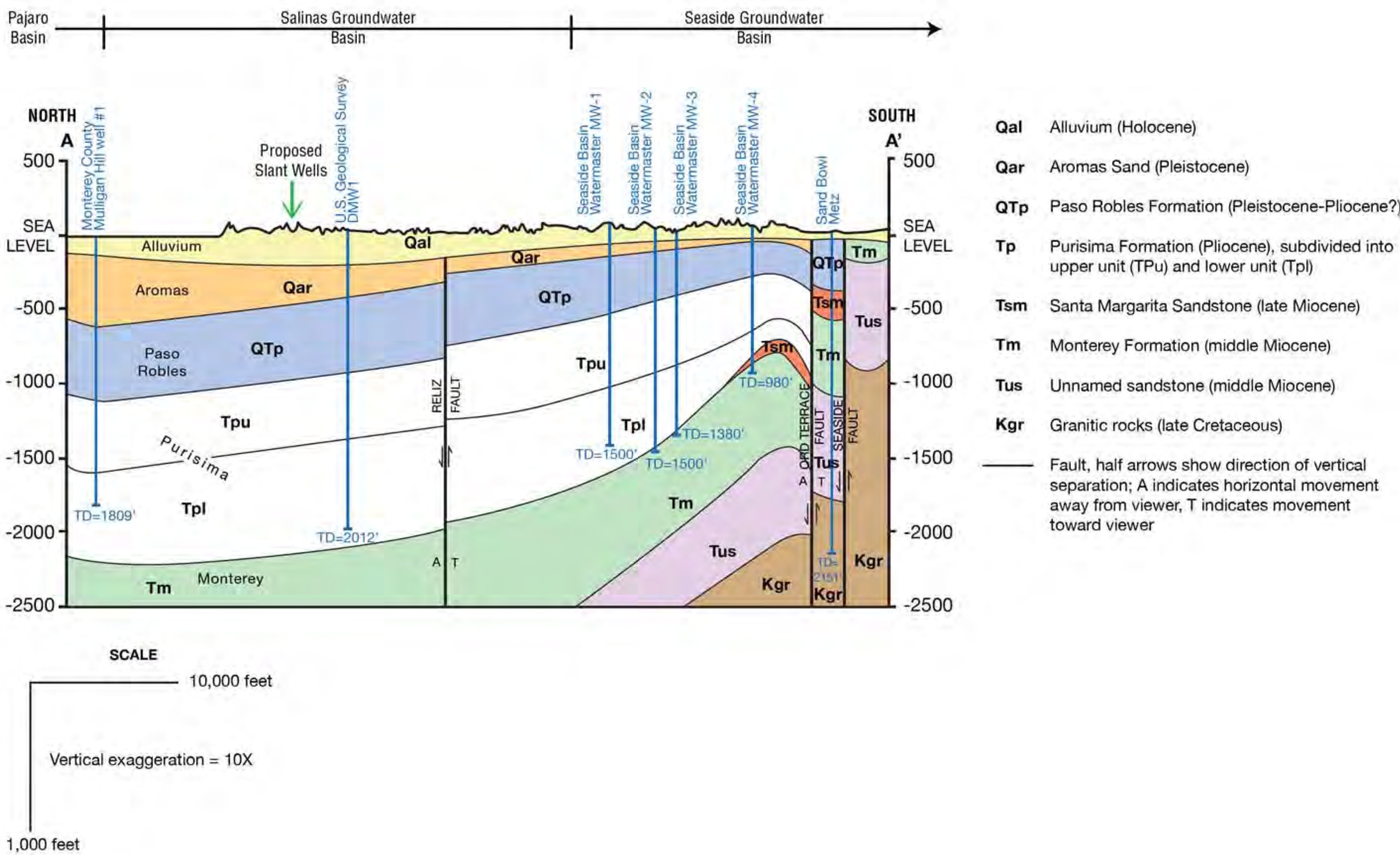


SOURCE: HydroMetrics, 2009

NOTES: TD = Total depth in feet

205335.01 Monterey Peninsula Water Supply Project

Figure 4.2-2

Generalized Geologic Cross-Section

Fill Materials

Fill materials are located throughout the project area (Ninyo and Moore, 2005, 2014). The fill is associated with previous grading for roads, bridges, railroad corridors, agricultural uses, and commercial, residential, and military land developments. The thicknesses of the fill deposits range from relatively shallow fills (a few feet thick) along roadways and railroad alignments in relatively flat, low-lying areas to deeper fills along bridge-approach embankments and in developed hillside areas. Most of the fill materials in the project area were likely derived from local native soils and would be similar in composition to the native soils described in the following sections.

Dune Sand Deposits

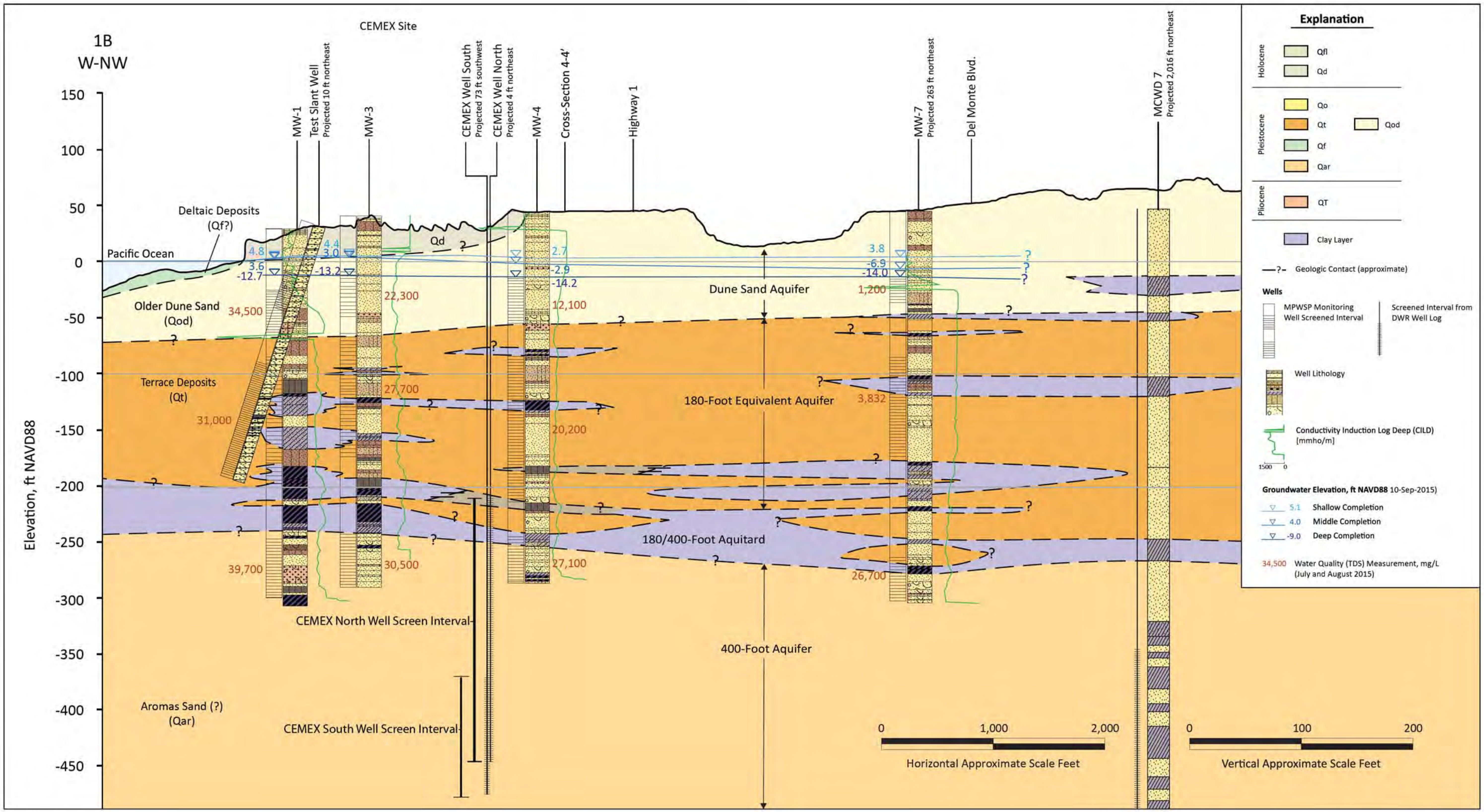
Dune sand deposits are present along the coastal areas from the proposed Seawater Intake System in the north to the eastern area of the city of Monterey in the south where the proposed pipeline additions would connect to the existing system (CGS, 2002b). Active, wind-blown dunes generally extend less than 0.5 mile inland, and older, more stabilized dunes extend up to 4 miles inland as well as offshore. Most of the project components would be located on or within dune deposits, except for the deeper portions of the proposed ASR injection/extraction wells, the Ryan Ranch–Bishop and Main System–Hidden Hills Interconnection Improvements, and the Carmel Valley Pump Station. The proposed subsurface slant wells would be partially screened within the dune sand deposits and some of the source water would be pumped from this unit.

The dune areas typically consist of elevated rolling hills composed of loose to moderately consolidated, fine sand (Ninyo & Moore, 2005; PCE, 2014). Younger, sparsely vegetated, active[6] dunes are present along the coastline. Older dune deposits[7] with more established vegetation are present in the inland areas and underlie the locations of most of the proposed project components. During the geologic reconnaissance, dune deposits were observed in existing cut slopes and excavations and ranged from loose to weakly cemented sands. Shallow groundwater is not expected within the elevated dune deposits, except in localized low-lying areas along the coastline.

Terrace Deposits

Pleistocene-age (1.6 mya to 11,000 years ago [ya]) terrace deposits are present beneath the CEMEX mining facility and the sea floor of MBNMS where the proposed slant wells would be constructed (Geoscience, 2016). The deeper portions of the proposed subsurface slant wells would be screened across these terrace deposits and some of the source water would be pumped from this unit. These terrace deposits are former alluvial fan and river floodplain deposits—which may also include marine terrace deposits—that generally consist of sand with some gravels. Uplifted Pleistocene marine terrace deposits are also present within the southern portion of the project area from Sand City to the city of Monterey (CGS, 2002b; Clark et al., 1997; Ninyo & Moore, 2014). These deposits are fine-grained sands and silts with locally thin, discontinuous gravel layers. The terrace deposits are typically dissected by streams and lie on the Aromas Sand. The deposits are variable in thickness, typically from up to 50 feet to a maximum of 200 feet (Muir, 1977). Terrace deposits at the CEMEX mining facility range from about 140 to 170 feet in thickness (Geoscience, 2016).

6 Active dunes are composed of loose sand shifting in real time.
7 Older dunes are inactive in that much of the sands have become weakly cemented, limiting active movement.



SOURCE: Geoscience, 2016

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Figure 4.2-3
Local Geologic Cross-Section

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Carmel Valley Floodplain Deposits

At the proposed Carmel Valley Pump Station sites, the Quaternary (1.6 mya to present) floodplain deposits along the Carmel River consist of a mixture of unconsolidated sand and silt deposits, commonly including relatively thin layers of clay (Clark et al., 1997). The older floodplain deposits are nearly flat to gently sloping and fill an irregularly shaped valley beneath the Carmel River. The Monterey Formation underlies these floodplain deposits.

Aromas Sand

The Pleistocene-age (1.6 mya to 11,000 ya) Aromas Sand consist of both older river deposits and younger eolian (windblown) deposits of unconsolidated, brown to red sands with interbeds of clay and poorly sorted gravels (Muir, 1977; Hanson, 2003). The eolian portion of the Aromas Sand crops out just east of the central and southern portion of the project area and extends beneath the project area to offshore on the continental shelf and in the Monterey submarine canyon (CGS, 2002b). In addition, the surface outcrops of the Aromas Sand have been mapped about 1 mile east of the CSIP Pond beneath the older dune sands to the west, as shown on **Figure 4.2-1**. The Aromas Sand overlies the Paso Robles Formation north of the east-to-west Ord Terrace Fault in Seaside, but is not present south of the fault (HydroMetrics, 2009). The proposed new ASR injection/extraction wells would be drilled to about 1,000 feet below the surface through the Aromas Sand into the deeper Santa Margarita Sandstone.

Paso Robles Formation

The Plio-Pleistocene-age (about 5.3 mya to 11,000 ya) Paso Robles Formation is a series of fine-grained, oxidized sand and silt beds that contain gravel beds (Clark et al., 1997) interbedded with some less-prevalent calcareous[8] beds (DWR, 2004). The Paso Robles Formation is interfingered[9] with the lower portion of the Aromas Sand and the upper portion of the Purisima Formation (HydroMetrics, 2009). The Paso Robles Formation is present beneath the northern portion of the project area at depths ranging from less than 100 feet to 600 feet (HydroMetrics, 2009). The proposed new ASR injection/extraction wells would be drilled to about 1,000 feet below the ground through the Paso Robles Formation into the deeper Santa Margarita Sandstone.

Purisima Formation

The mostly marine Miocene-age (24 mya to 5.3 mya) to Pliocene-age (5.3 mya to 1.8 mya) Purisima Formation underlies the project area at depths ranging from about 400 feet below the surface in Seaside to as much as 1,100 feet in the northern part of the project area (Powell et al., 2007; HydroMetrics, 2009) and extends westward under Monterey Bay (Muir, 1977). The Purisima Formation consists of layered sand, silt, clay, shale, and some gravel deposited in near-shore and far-shore marine environments. The basal, or lowermost, unit of the Purisima Formation consists of relatively impermeable clay and shale (Muir, 1977; HydroMetrics, 2009).

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8 Mostly or partly composed of calcium carbonate i.e. containing lime or being chalky.
9 Pertains to the lateral change from one rock or sediment type to another in a zone where the two types form interpenetrating wedges.

The proposed new ASR injection/extraction wells would be drilled through this unit, into the deeper Santa Margarita Sandstone.

Santa Margarita Formation

The late Miocene-age (24 mya to 5.3 mya) to Pliocene-age (5.3 mya to 1.8 mya) Santa Margarita Sandstone is a marine, coarse-grained sandstone that overlies the Monterey Formation (Clark et al., 1997; MCWRA, 2006). Relatively small pieces of this unit are present beneath the project area in the Seaside vicinity at depths of about 800 feet deep just north of the Ord Terrace Fault and about 500 feet below ground surface (bgs) in between the Ord Terrace and Seaside Faults (HydroMetrics, 2009), as shown on **Figure 4.2-2**. The unit has surface outcrops east of the project area (CGS, 2002b) and is up to 400 feet thick in places (Durbin, 2007). The proposed new ASR injection/extraction wells would be drilled to about 1,000 feet below the surface and screened within the Santa Margarita Sandstone.

Monterey Formation

The Tertiary-age (65 mya to 1.6 mya) Monterey Formation is a marine sedimentary unit generally consisting of siliceous and diatomaceous[10] interbedded layers of mudstone, siltstone, sandstone, and claystone (Clark et al., 1997). Seams of the expandable clay bentonite are also present (Ninyo & Moore, 2005, 2014). This unit is present at the proposed Main System–Hidden Hills Interconnection Improvements. The Monterey Formation is at the surface on both sides of the Carmel Valley and underlies the Carmel Valley floodplain deposits beneath the proposed Carmel Valley Pump Station. The unit extends beneath the remainder of the project area to the north, as well as west into Monterey Bay.

4.2.1.2 Seismicity and Faults

This section characterizes the region's existing faults, describes historical earthquakes, estimates the likelihood of future earthquakes, and describes probable groundshaking effects.

Earthquake Terminology and Concepts

Earthquake Mechanisms and Fault Activity

Faults are planar features within the earth's crust that have formed to release strain caused by the dynamic movements of the earth's major tectonic plates. An earthquake on a fault is produced when these strains overcome the inherent strength of the earth's crust, and the rock ruptures. The rupture causes seismic waves that propagate through the earth's crust, producing the groundshaking effect known as an earthquake. The rupture also causes variable amounts of slip along the fault, which may or may not be visible at the earth's surface.

Geologists commonly use the age of offset rocks as evidence of fault activity—the younger the displaced rocks, the more recently earthquakes have occurred. To evaluate the likelihood that a fault would produce an earthquake, geologists examine the magnitude and frequency of recorded

[10] Diatomaceous deposits consist of fossilized amorphous silica remains of diatoms, a type of hard-shelled algae.

earthquakes and evidence of past displacement along a fault. The State of California defines an active fault as one that has had surface displacement within Holocene time (the CGS defines this as within last 11,000 years; the USGS uses 15,000 years). A Quaternary fault is defined as a fault that has shown evidence of surface displacement during the Quaternary period (the last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not mean that a fault lacking evidence of surface displacement is necessarily inactive. The term "sufficiently active" is also used to describe a fault if there is some evidence that Holocene displacement has occurred on one or more of its segments or branches (Hart, 1997).

For the purpose of delineating fault rupture zones, the CGS historically sought to identify faults defined as potentially active, which are faults that have shown evidence of surface displacement during the Quaternary period. Older maps still use the "potentially active" term. However, under the Alquist-Priolo Earthquake Fault Zoning Act, usage of this term was discontinued when it became apparent that the sheer number of Quaternary-age faults in the state made it meaningless to zone all of them (Bryant and Hart, 2007). In late 1975, the state geologist made a policy decision to zone only those faults that had a relatively high potential for ground rupture, determining that a fault should be considered for zoning only if it was sufficiently active and "well defined."[11] Blind faults do not show surface evidence of past earthquakes, even if they occurred in the recent past; and faults that are confined to pre-Quaternary rocks (more than 1.6 million years old) are considered inactive and incapable of generating an earthquake.

Earthquake Magnitude

When an earthquake occurs along a fault, its size can be determined by measuring the energy released during the event. A network of seismographs records the amplitude and frequency of the seismic waves that an earthquake generates. The Richter magnitude (ML) of an earthquake represents the highest amplitude measured by the seismograph at a distance of 100 kilometers from the epicenter. Richter magnitudes vary logarithmically with each whole-number step, representing a tenfold increase in the amplitude of the recorded seismic waves and 32 times the amount of energy released. While Richter magnitude was historically the primary measure of earthquake magnitude, seismologists now use Moment Magnitude (Mw) as the preferred way to express the size of an earthquake. The Moment Magnitude scale is related to the physical characteristics of a fault, including the rigidity of the rock, the size of fault rupture, and the style of movement or displacement across the fault. Although the formulae of the scales are different, they both contain a similar continuum of magnitude values, except that Mw can reliably measure larger earthquakes and do so from greater distances.

Peak Ground Acceleration

A common measure of ground motion at any particular site during an earthquake is the peak ground acceleration (PGA). The PGA for a given component of motion is the largest value of

[11] A fault is considered well defined if its trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The fault may be identified by direct observation or by indirect methods (e.g., geomorphic and geophysical evidence). The critical consideration is that the fault, or some part of it, can be located in the field with sufficient precision and confidence to indicate that the required site-specific investigations would meet with some success.

horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g), which is approximately 980 centimeters per second squared. In terms of automobile acceleration, one "g" of acceleration is equivalent to the motion of a car traveling 328 feet from rest in 4.5 seconds. For comparison purposes, the maximum PGA value recorded during the Loma Prieta earthquake in the vicinity of the epicenter, near Santa Cruz, was 0.64 g. Unlike measures of magnitude, which provide a single measure of earthquake energy, PGA varies from place to place and is dependent on the distance from the epicenter and the character of the underlying geology (e.g., hard bedrock, soft sediments, or artificial fills).

Modified Mercalli Intensity Scale

The Modified Mercalli Intensity Scale assigns an intensity value based on the observed effects of groundshaking produced by an earthquake. Unlike measures of earthquake magnitude and PGA, the Modified Mercalli Intensity Scale is qualitative in nature in that it is based on actual observed effects rather than measured values. Similar to PGA, Modified Mercalli values for an earthquake at any one place can vary depending on the earthquake's magnitude, the distance from its epicenter, the focus of its energy, and the type of geologic material. The Modified Mercalli values for intensity range from I (earthquake not felt) to XII (damage nearly total), and intensities ranging from IV to X can cause moderate to significant structural damage. Because the Modified Mercalli scale is a measure of groundshaking effects, intensity values can be correlated to a range of average PGA values, as shown in **Table 4.2-2**.

Faults and Historical Earthquake Activity

The project area is located in a seismically active region of California. The Coast Ranges geomorphic province is composed of a series of parallel, northwest-trending mountain ranges and valleys that are generally controlled by faults. These faults juxtapose blocks of geologic units of different origins called belts. The Monterey Bay region is located within the Salinian Block, which is a northwest-trending belt bounded to the east by the San Andreas Fault and to the west by the San Gregorio (Sur) Fault. Major earthquakes have affected the region in the past and are expected to occur in the near future on one of the principal active faults in the San Andreas Fault System.

The Monterey Bay region contains both active and potentially active faults, and is considered a region of high seismic activity. Throughout the project area, there is the potential for damage resulting from movement along any one of a number of the active faults that are oriented generally perpendicular to the coastline. In 2007, the USGS, the CGS, and the Southern California Earthquake Center formed the Working Group on California Earthquake Probabilities (WGCEP) to evaluate the probability of one or more earthquakes of Mw 6.7 or higher occurring in the state of California over the next 30 years. Accounting for the wide range of possible earthquake sources, it is estimated that the San Francisco and Monterey Bay areas as a whole have a 72 percent chance of experiencing an earthquake of Mw 6.7 or higher in the next 30 years; among the various active faults in the region, the San Andreas Fault System is the most likely to cause such an event (WGCEP, 2015a).

TABLE 4.2-2
MODIFIED MERCALLI INTENSITY SCALE

Intensity Value	Intensity Description	Average Peak Ground Acceleration[a]
I	Not felt	< 0.0017 g
II	Felt by people sitting or on upper floors of buildings	0.0017 to 0.014 g
III	Felt by almost all indoors. Hanging objects swing. Vibration like passing of light trucks. May not be recognized as an earthquake.	0.0017 to 0.014 g
IV	Vibration felt like passing of heavy trucks. Stopped cars rock. Hanging objects swing. Windows, dishes, doors rattle. Glasses clink. In the upper range of IV, wooden walls and frames creak.	0.014 to 0.039 g
V (Light)	Felt outdoors. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing. Pictures move. Pendulum clocks stop.	0.035 to 0.092 g
VI (Moderate)	Felt by all. People walk unsteadily. Many frightened. Windows crack. Dishes, glassware, knickknacks, and books fall off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster, adobe buildings, and some poorly built masonry buildings cracked. Trees and bushes shake visibly.	0.092 to 0.18 g
VII (Strong)	Difficult to stand or walk. Noticed by drivers of cars. Furniture broken. Damage to poorly built masonry buildings. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices, unbraced parapets and porches. Some cracks in better masonry buildings. Waves on ponds.	0.18 to 0.34 g
VIII (Very Strong)	Steering of cars affected. Extensive damage to unreinforced masonry buildings, including partial collapse. Fall of some masonry walls. Twisting, falling of chimneys and monuments. Wood-frame houses moved on foundations if not bolted; loose partition walls thrown out. Tree branches broken.	0.34 to 0.65 g
IX (Violent)	General panic. Damage to masonry buildings ranges from collapse to serious damage unless modern design. Wood-frame structures rack, and, if not bolted, shifted off foundations. Underground pipes broken.	0.65 to 1.24 g
X (Very Violent)	Poorly built structures destroyed with their foundations. Even some well-built wooden structures and bridges heavily damaged and needing replacement. Water thrown on banks of canals, rivers, lakes, etc.	> 1.24 g
XI (Very Violent)	Few, if any, masonry structures remain standing. Bridges destroyed. Rails bent greatly. Underground pipelines completely out of service.	> 1.24 g
XII (Very Violent)	Damage nearly total. Practically all works of construction are damaged greatly or destroyed. Large rock masses displaced. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown into the air.	> 1.24 g

NOTES:

[a] Value is expressed as a fraction of the acceleration due to gravity (g). Gravity (g) is 9.8 meters per second squared. 1.0 g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

SOURCES: ABAG, 2016; CGS, 2003.

Several active and potentially active faults have been mapped within or close to the project area. **Figure 4.2-4** shows the approximate locations of the major faults in the region and their geographic relationship and orientation to the project area. **Table 4.2-3** lists the principal active and potentially active faults in the region that could affect the project components; the type of the faults; and the estimated maximum Moment Magnitude of earthquakes that could occur on each fault. The approximate distance to each fault is based on estimated distances from the nearest proposed project component. None of the faults cross, nor are they located near the proposed slant wells or the existing outfall, located within submerged lands and waters of MBNMS.

Regional Faults

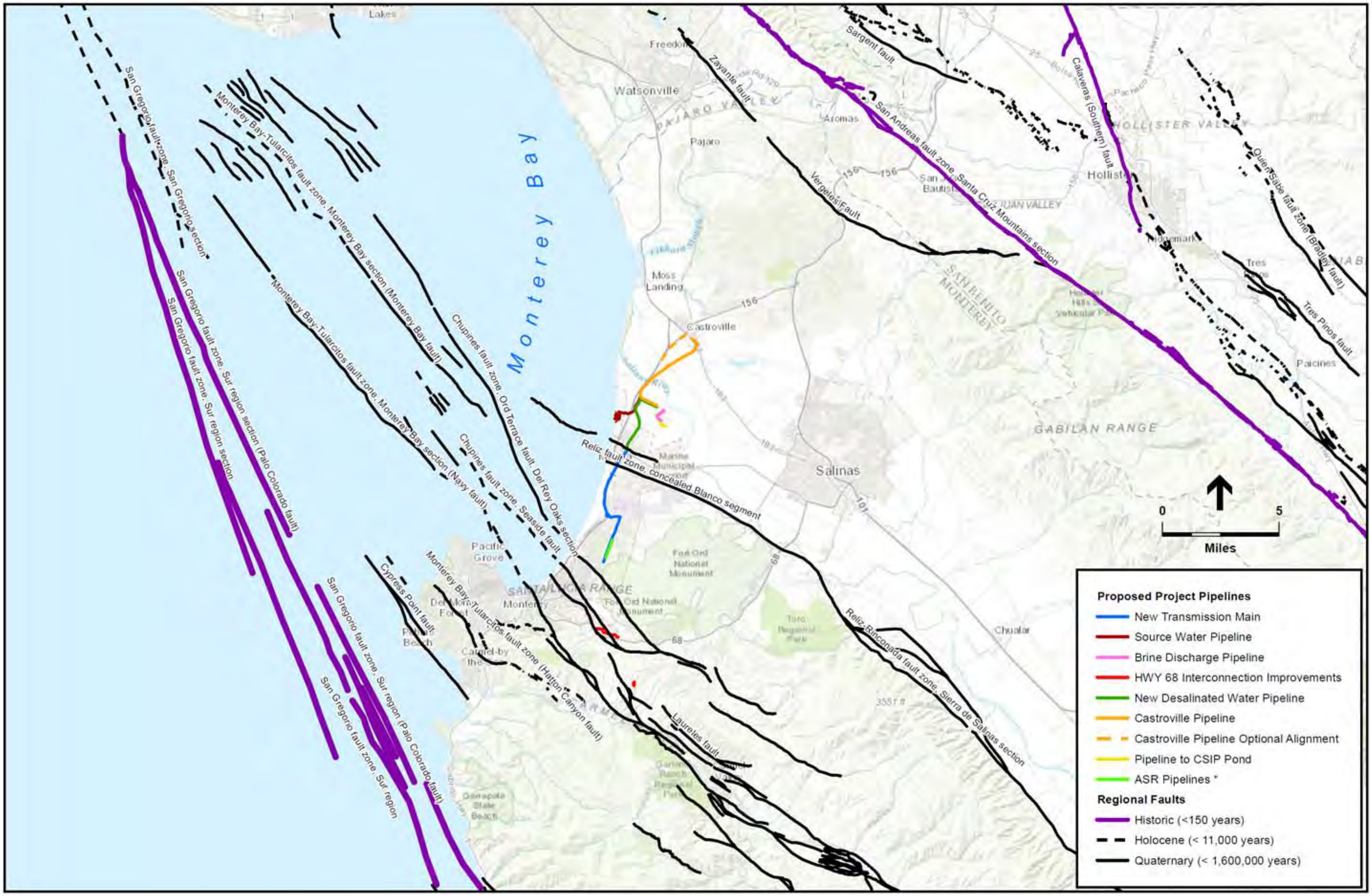
San Andreas Fault Zone

The San Andreas Fault Zone is a major structural feature in the region and forms a boundary between the North American and Pacific tectonic plates (Bryant and Lundberg, 2002). The San Andreas Fault is a major northwest-trending, right-lateral,[12] strike-slip[13] fault. The fault extends for about 600 miles from the Gulf of California in the south to Cape Mendocino in the north. The San Andreas is not a single fault trace but rather a system of active faults that diverges from the main fault south of San Jose. Regional faults that are subparallel to the San Andreas Fault, such as the Hayward, Calaveras, and San Gregorio Faults, are within the broader San Andreas Fault System (see **Figure 4.2-4**).

The San Andreas Fault has produced numerous large earthquakes, including the 1906 San Francisco earthquake. That event had an estimated ML 8.3, or Mw 7.8 (WGCEP, 2008a, 2008b) and was associated with up to 21 feet of displacement and widespread ground failure, including several hundred miles of surface fault rupture (Lawson, 1908). In the Watsonville area and to the east, reports of strong groundshaking, toppled chimneys, ground cracks, broken pipes, and twisted and sunken railroad tracks (Lawson, 1908) indicate that groundshaking intensities reached IX on the Modified Mercalli scale.

Numerous moderate-sized earthquakes (approximately magnitude 5.2) in Watsonville (in 1954 and again in 1964 and 1969) resulted in broken irrigation lines, ruptured water mains, and cracked plaster and stucco (PVWMA, 2001). The magnitude 6.9 Loma Prieta earthquake of October 1989, centered in the Santa Cruz Mountains, caused strong groundshaking and ground failure throughout the San Francisco and Monterey Bay areas. Major damage was experienced in downtown and residential Watsonville, Castroville, Gilroy, and Hollister (McNutt and Toppozada, 1990). In the project area, the Loma Prieta earthquake produced a PGA of 0.39 g and groundshaking with a Modified Mercalli intensity of VIII.

12 To an observer straddling a right-lateral fault, the right-hand block or plate would move towards the observer.
13 A strike-slip fault creates vertical (or nearly vertical) fractures (i.e., the blocks primarily move horizontally). If the block opposite an observer looking across the fault moved to the right, the slip style is termed “right lateral;” if the block moved to the left, the motion is termed “left lateral.”



NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

SOURCE: USGS/CGS, 2010

205335.01 Monterey Peninsula Water Supply Project

Figure 4.2-4

Active and Potentially Active Regional Faults

TABLE 4.2-3
ACTIVE AND POTENTIALLY ACTIVE FAULTS

Fault or Fault Zone	Location Relative to Project Components	Recency of Faulting	Slip Rate (millimeters/ year)	Maximum Moment Magnitude (Mw)	Historical Seismicity[a]
Monterey Bay – Tularcitos Fault Zone[b]	Beneath Main System–Hidden Hills Interconnection Improvements	Late Quaternary with evidence of Holocene activity (Potentially Active)	0.2 to 1.0	7.3	
Reliz–Rinconada Fault Zone (Blanco Section)	Beneath new Transmission Main	Late Quaternary (Potentially Active)	0.2 to 1.0	7.5	
Hatton Canyon Fault	0.5 miles northeast of Carmel Valley Pump Station	Quaternary with evidence of Holocene Activity (Potentially Active)	0.2 to 1	not estimated	
Laureles Fault	1.5 miles southwest of Main System–Hidden Hills Interconnection Improvements	Late Quaternary (Potentially Active)	Unknown	5.5	
San Gregorio Fault (Sur Region)	5 miles southwest of Carmel Valley Pump Station	Historical (<200 years ago) (Active)	1 to 7	7.0	6+, 1926
Zayante–Vergeles Fault Zone	12 miles northeast of MPWSP Desalination Plant and 8.5 miles northeast of northern terminus of Castroville Pipeline	Holocene (Active)	0.1	7.0	
San Andreas Fault	16 miles northeast of MPWSP Desalination Plant and 13 miles northeast of northern terminus of Castroville Pipeline	Historical (Active)	13 to 21	6.2 to 7.0	6.9, 1989 7.8, 1906 6.7, 1898 6.5, 1885
Sargent Fault Zone	19 miles northeast of MPWSP Desalination Plant and 16 miles northeast of northern terminus of Castroville Pipeline	Late Quaternary (Potentially Active)	1 to 5	6.8	
Calaveras Fault (southern)	25 miles northeast of MPWSP Desalination Plant and 22 miles northeast of northern terminus of Castroville Pipeline	Historical (Active)	10 to 20	5.8	6.3, 1897 6.5, 1911

NOTES:
[a] Richter Magnitude (M_L) or Moment Magnitude (Mw) and year of recent or large events. References that cite earthquake magnitudes do not always specify whether the measurement used the Richter or Moment Magnitude scale; however, the M_L and Mw values are similar up to about 7.
[b] Includes the Chupines, Seaside, Ord Terrace, and Navy Faults.

SOURCES: CGS, 2003; USGS, 2010; Johnson, 2004; Clark et al., 1997; Field, et.al., 2013

The San Andreas Fault, which has experienced multiple large earthquake events resulting in large surface fault rupture, is a designated earthquake fault zone under the Alquist-Priolo Earthquake Fault Zoning Act (see Section 4.2.2.2, State Regulations). According to the WGCEP, the Northern California portion of the San Andreas Fault has a 16 percent of producing a Mw 6.7 or larger earthquake during the next 30 years (WGCEP, 2015b). The CCSD connection is located about 12.5 miles southwest of the San Andreas Fault.

San Gregorio Fault Zone

The San Gregorio Fault Zone is a complex of faults that skirt the coastline north of Big Sur and run northwestward across Monterey Bay, briefly touching the shoreline of the San Mateo County coastline at Point Año Nuevo and at Seal Cove, just north of Half Moon Bay (Bryant and Cluett, 1999b). This fault is active and was recently recognized as capable of producing large earthquakes. Studies have shown Holocene displacement on the San Gregorio Fault as recently as 1270 AD to 1400 AD (Bryant and Cluett, 1999b). Additionally, a 1926 earthquake with a Richter magnitude above 6.0—previously thought to have occurred on the Monterey Fault—may have actually ruptured an offshore segment of the San Gregorio Fault Zone (Johnson, 2004). According to the WGCEP, the San Gregorio Fault has a 1.34 percent chance of producing a MW 6.7 or larger earthquake in the next 30 years (WGCEP, 2015b). The closest portion of the fault to a proposed project component is approximately 10 miles southwest of the Highway 68 Interconnection Improvement.

Calaveras Fault Zone

The Calaveras Fault Zone, a major right-lateral, strike-slip fault, extends for about 100 miles from Dublin to Hollister, where it merges with the San Andreas Fault (Bryant and Cluett, 1999a). The Calaveras Fault is designated as an earthquake fault zone under the Alquist-Priolo Act. The Calaveras Fault is most active on its southern segment; the magnitude 6.2 Morgan Hill earthquake (April 1984) originated on this fault. Tectonic creep[14] has been documented along the Calaveras Fault in the vicinity of Hollister. According to the WGCEP, the Calaveras Fault has a 17.09 percent chance of producing a MW 6.7 or larger earthquake in the next 30 years (WGCEP, 2015b). The CCSD connection is located about 20 miles west of the Calaveras Fault Zone.

Sargent Fault Zone

The Sargent Fault Zone branches from the San Andreas Fault and extends for about 34 miles, from the Lexington Reservoir in the north to just north of Hollister in the south (Bryant, 2000a). The Sargent Fault is a reverse-oblique,[15] right-lateral, strike-slip fault zone that dips steeply to the west and is seismically active. The fault is considered to be capable of surface rupture and is designated as an Alquist-Priolo earthquake fault zone. According to the WGCEP, the Sargent Fault Zone has a 0.82 percent chance of producing a MW 6.7 or larger earthquake in the next 30 years (WGCEP, 2015b). The CCSD connection is located about 16.25 miles southwest of this fault.

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14 Tectonic creep is the slow, apparently continuous movement on a fault (Bates and Jackson, 1980).

15 In a reverse fault, the block above the fault moves up relative to the block below the fault. This fault motion is caused by compressional forces and results in shortening. Oblique-slip faulting suggests both dip-slip faulting (vertical movement) and strike-slip faulting (horizontal movement).

Zayante-Vergeles Fault Zone

The Zayante-Vergeles Fault Zone is approximately parallel with and about 5 miles west of the San Andreas Fault (Bryant, 2000b). The Zayante Fault is considered to be a late Pleistocene-age (1.6 mya to 11,000 ya), and possibly Holocene, potentially active Quaternary fault. Some portions of the Zayante Fault may be active, and some scientists believe its southern section may be indirectly connected to the San Andreas Fault Zone. Following recent investigations of the Vergeles Fault, the CGS designated portions of the fault as a fault rupture hazard zone USGS Watsonville East and Watsonville West 7.5-minute topographic map). However, other portions of the Vergeles are classified as potentially active and are not designated under the Alquist-Priolo Act. According to the WGCEP, the Zayante-Vergeles Fault Zone has a 0.10 percent chance of producing a MW 6.7 or larger earthquake in the next 30 years (WGCEP, 2015b). The CCSD connection is located about 8.25 miles southwest of this fault.

Local Faults

Several Quaternary faults intersect the project area. Additionally, several potentially active faults cross, or are located in close proximity to components of the proposed project.

Reliz-Rinconada Fault Zone

The Reliz-Rinconada Fault Zone runs parallel to Highway 101 along the Salinas River Valley at the base of the Santa Lucia Mountains. This high-angle, reverse fault offsets Salinian Block basement rocks and locally juxtaposes the Pliocene-Pleistocene-age (5.3 mya to 11,000 ya) Paso Robles Formation against basement rocks (Rosenberg and Bryant, 2003). The Reliz Fault has been projected crossing northwest-southeast through the central portion of the project area in the vicinity of Marina (Ninyo & Moore, 2005). The fault trace in this area is concealed by fluvial deposits of the Salinas River Valley and coastal dunes, causing uncertainty as to the precise location of the fault. Geologic evidence indicates that this fault system has displaced materials that are between 50,000 to 100,000 years old and is considered potentially active (Rosenberg and Bryant, 2003; Rosenberg and Clark, 2009). According to the WGCEP, the Reliz-Rinconada Fault Zone has a 0.31 percent chance of producing a MW 6.7 or larger earthquake in the next 30 years (WGCEP, 2015b). The new Transmission Main would cross this fault; the slant wells at CEMEX would be north of this fault.

Monterey Bay–Tularcitos Fault Zone

The Monterey Bay–Tularcitos Fault Zone extends for about 52 miles, from Santa Cruz to the crest of the Sierra de Salinas. The onshore portion of the fault zone includes the Chupines, Seaside, Tularcitos, Navy, Ord Terrace, and Hatton Canyon Faults (Bryant, 2001). These faults create an approximately 6- to 9-mile-wide zone of short in-echelon, northwest-striking faults that are related. The activity and locations of these faults are not well defined. Data presented by Jennings (2010) show that no active portions of the Monterey Bay–Tularcitos Fault Zone extend onshore into the southern portion of the project area. Jennings classifies the Ord Terrace, Seaside, Chupines, and Tularcitos Faults as Quaternary. However, Bryant (2001), citing Rosenberg and Clark et al. (1997), provides evidence of Holocene displacement along the Hatton Canyon, and Tularcitos Faults, which are located close to the proposed Carmel Valley Pump Station. The

Monterey section of the Monterey Bay-Tularcitos Fault Zone also crosses the route of the new Transmission Main. Additionally, there is evidence of a probable offshore extension of the Chupines Fault displacing Holocene-age (less than 11,000 years old) deposits and sea floor sediments (Ninyo & Moore, 2014). There is evidence for recent (less than 11,000 ya) displacement on the individual faults of the Monterey Bay-Tularcitos Fault Zone and therefore, considering the proximity of these active strands to project components, these faults should be considered active for planning purposes. According to the WGCEP, the Monterey Bay–Tularcitos Fault Zone has a 0.64 percent chance of producing a MW 6.7 or larger earthquake in the next 30 years (WGCEP, 2015b). The Highway 68 Interconnection Improvements would be about 2 miles northwest of this fault zone.

Laureles Fault Zone

The northwest-striking, nearly vertical, reverse[16] Laureles Fault Zone extends approximately 4 miles along the north side of Carmel Valley and is up to 0.2 mile wide (Clark et al., 1997). The northeast side is upthrown and displaces Pleistocene-age (5.3 mya to 11,000 ya) terrace gravels, suggesting the latest movement to be middle to late Pleistocene. The Laureles Fault is about 1.5 miles southwest of Main System–Hidden Hills Interconnection.

4.2.1.3 Geologic Hazards

Based on the geologic data reviewed during preparation of this EIR/EIS, the potential geologic hazards at the proposed project sites include soil erosion, slope instability, and soils hazards. These geologic hazards are discussed below.

Erosion

Erosion is the wearing away of soil and rock by processes such as mechanical or chemical weathering, mass wasting, and the action of waves, wind, and underground water. Excessive soil erosion can eventually damage infrastructure such as pipelines, wellheads, building foundations, and roadways. In general, granular soils with relatively low cohesion and soils located on steep topography have a higher potential for erosion. The *Monterey County General Plan* (Monterey County, 2010) includes a soil erosion hazard map showing relative erosion hazards within the county. Soils are classified based on the soil surveys consolidated for the soil survey geographic database for Monterey County prepared by the National Resources Conservation Service (NRCS, 2014). In the project area, the steep coastal dune slopes have a high potential for erosion. The dune deposits east of the coastline, where the topography is not as steep, are considered to have a moderate potential for erosion. The soil erosion potential is typically reduced or eliminated once the soil is graded and covered with concrete, structures, asphalt, vegetation, or other slope protection measures are implemented.

[16] A geologic fault in which the hanging wall (the upper block) has moved upward relative to the footwall (the lower block). Reverse faults occur where two blocks of rock are forced together by compression.

Sea Level Rise and Coastal Erosion

Monterey Bay is a large, lowland coastal embayment, with rocky headlands at the north and south and a sweeping arc of sandy, dominantly dune- and cliff-backed shoreline in between. The shoreline of south Monterey Bay (from the Salinas River south to Del Monte Beach in the city of Monterey) includes an 11-mile stretch of continuous sandy beach that is wider at the southern end than at the northern end. The morphology of beaches in this region varies from season to season, with beaches generally being wider and gently sloping in summer and narrower and steeper in winter. The dunes at the back edge of the beach have an average height of 34 feet but can be as high as 151 feet. Some of the dune surfaces that are not directly exposed to wave energy are vegetated, indicating that the dunes are stabilized in some areas.

The topographic surface, including the dunes, beach, and undersea nearshore areas, can be affected by coastal retreat in four ways.

1. **Long-term erosion.** Over time, the dunes and surrounding area have been and will continue to erode as a result of rain and wind.

2. **Sea level rise.** As sea level rises, the shoreline area affected by wave action will migrate inland and will erode the sand dunes. As a result, the dunes and the shoreline will also retreat inland. In addition, the surge from storm events, discussed below, would push further inland.

3. **Storm events.** Storm events also erode sand from the coastal dunes and shoreline areas. Typically, a storm event moves sand out to sea during the event. The strongest of these events are referred to as the 100-year storm event. Similar to the 100-year flood event, the 100-year storm event is the storm that has a 1 percent chance of occurring in a given year. After the storm passes and over the following year, some and possibly most of the sand re-accumulates along the shore and dune areas. However, at the time of that storm event, any structures present within that scoured area would be exposed. For example, a winter storm surge in early March 2016 exposed the buried MRWPCA ocean outfall pipe. Up to 15 feet of scour was observed around the exposed section of the outfall. The last time the outfall pipe was exposed was in 1997. The 2016 storm surge also broke the discharge pipe from the Test Slant Well to the outfall.

4. **Rip embayments.** Rip embayments are caused by the erosive action of cross-shore rip currents and affect an area from just offshore to the toe of the sand dunes closest to the shoreline. As this sand is removed, sand from the shore area and ultimately the dunes can erode seaward to fill in the void. Rip embayments tend to be stronger in the winter and weaker in the summer. After the rip embayment passes by a particular shoreline location, some of the sand re-accumulates.

The northwestern Marina area, including the proposed location of the subsurface slant wells, is characterized by extensive sand dunes. These dunes vary in height and are composed entirely of unconsolidated, highly erodible sand. The erosion of dunes by waves occurs more often in winter months, when the active beach area is narrow and storms are stronger and more frequent. Erosion in this region is highly episodic, occurring in steps when high tides coincide with large, storm-generated waves. The steep to near-vertical bluffs in the vicinity of the CEMEX active mining area indicate that rapid erosion has taken place in this area (see **Figure 4.3-3**, Areas Subject to Sea Level Rise in the Project Area in Section 4.3, Surface Water Hydrology and Water Quality).

The existence of wide sandy beaches throughout the area, as well as the flanking sand dunes, indicate that past sand supply was in excess of sand loss. However, the shoreline of southern Monterey Bay has been retreating for a number of years. Dam impoundments have decreased the historical sediment yield of the Salinas River, thus reducing a major source of sediment for the beaches in the Marina area. The Nacimiento Dam (completed in 1957) and the San Antonio Dam (completed in 1967) have impounded about 15 percent of the Salinas River Watershed, thereby trapping sand that would have been delivered to the beach, as well as reducing peak flow rates that transport the bulk of the river sediments. Additionally, sand mining in the region has increased sediment and sand loss and has contributed to disequilibrium, thus increasing the rate of coastal retreat in the southern Monterey Bay south of the Salinas River (Thornton et. al., 2006).

As discussed in the *Analysis of Historic and Future Coastal Erosion with Sea Level Rise* (ESA, 2014), various studies conducted over the period between 1930 to 2006 indicate sea level is rising at a rate of approximately 5.3 to 7.6 inches per century. With sea level rise, the coastline is expected to retreat inland and has the potential to intersect project components if they are constructed within the extent of that retreat.

Corrosive or Expansive Soils

Table 4.2-4 identifies the soil types and soil properties at proposed facility locations. The subsurface slant wells would be constructed in subsurface dune sands, which are not considered soil because the sand lacks sufficient humus; therefore, information regarding soil properties at the subsurface slant well site is not included. Potential impacts related to problematic soil conditions include corrosivity and expansion (linear extensibility or shrink-swell potential). Drainage pertains to soils that are unable to adequately percolate or shed surface water away from a development site, leading to flooding and water-related damage. Poorly drained soils can increase the risks of corrosion, linear extensibility, differential settlement, and other water-related issues.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical actions that corrode or weaken concrete or uncoated steel, once placed. The rate of concrete corrosion is based mainly on the sulfate, sodium, and chloride content, texture, moisture content, and acidity of the soil. The rate of uncoated-steel corrosion is related to such factors as the moisture, particle-size distribution, acidity, and electrical conductivity of the soil. Steel installations that intersect soil boundaries or soil layers are more susceptible to corrosion than the steel installations that are entirely within one kind of soil or within one soil layer. The risk of corrosion is expressed as low, moderate, or high.

Linear extensibility or shrink-swell potential refers to the change in volume of soil as moisture content is increased or decreased between a moist and dry state. The volume change is reported as a percent change for the whole soil. The amount and type of clay minerals in the soil influence changes in soil volume.

The soil properties listed above are general properties for soil types. A site-specific geotechnical investigation was conducted at the proposed desalination plant (PCE, 2014). Soil samples were analyzed for soil resistivity, chloride, sulfate, and pH. The results indicate the soil to be non-corrosive.

TABLE 4.2-4
SUMMARY OF GENERAL SOIL PROPERTIES

Proposed Project Component	Soil	Drainage	Concrete Corrosion Potential	Unprotected Steel Corrosion Potential	Linear Extensibility[a]
MPWSP Desalination Plant, and Most Pipelines[b]	Oceano Loamy[c] Sand (OaD) or similar	Excessively	Moderate	Moderate	Low (1.5%)
Castroville Pipeline	Pacheco Clay Loam	Poorly Drained	Low	High	Moderate (3 to 6%)
ASR Injection/ Extraction Wells and Pipelines[b,d]	Oceano Loamy Sand (OaD)	Excessively	Moderate	Moderate	Low (1.5%)
Carmel Valley Pump Station	Dissected xerorthents[e]	Excessively	Low	Low	Low to moderate (1.5 to 4.5%)
Main System–Hidden Hills Inter-connection Improvements	Santa Ynez Fine Sandy Loam (ShE)	Moderately well	Low	Low	Moderate (4.5%)
Ryan Ranch–Bishop Interconnection Improvements	Santa Ynez Fine Sandy Loam (ShE); Narlon Loamy Fine Sand (NcC); and badland weathered bedrock (Ba)	Moderately well to somewhat poorly	Low (ShE and Ba); High (NcC)	High (NcC); no data for other units	Moderate to high (4.5 to 7%)

NOTES:
a Also known as shrink-swell potential or expansion potential.
b All pipelines except the ASR Conveyance Pipelines, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline.
c Loamy soils are composed of sand, silt, and clay in relatively even concentrations (about 40-40-20 percent concentration, respectively). Loam soils generally contain more nutrients and humus than sandy soils, have better drainage and infiltration of water and air than silty soils, and are easier to till than clay soils.
d These are the ASR Conveyance Pipelines and the ASR Pump-to-Waste Pipeline.
e Dissected xerorthents are deposits located on alluvial fans and terraces with steeper slopes such that the alluvial deposits do not have sufficient time to develop into soils.

SOURCE: NRCS, 2014.

4.2.1.4 Seismic Hazards

Seismic hazards are generally classified into two categories: primary seismic hazards (surface fault rupture and groundshaking) and secondary seismic hazards (liquefaction and other types of seismically induced ground failure, along with seismically induced landslides).

Surface Fault Rupture

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake’s seismic waves. The magnitude, sense, and nature of fault rupture can vary for different faults or even along different strands of the same fault. Although future earthquakes could occur anywhere along the length of an active fault, only regional strike-slip earthquakes of magnitude 6.0 or greater are likely to be associated with significant surface fault rupture and offset (CDMG and USGS, 1996). It is also important to note that unmapped subsurface fault traces could experience unexpected and unpredictable earthquake activity and fault rupture.

Ground rupture is considered more likely along active faults, which are referenced above in **Figure 4.2-4** and **Table 4.2-3** and described in Section 4.2.1.2. The highest potential for surface faulting is along existing fault traces that have had Holocene displacement. The closest known active faults with historical earthquake events are the San Gregorio, Zayante-Vergales, and San Andreas at 5, 11, and 15 miles, respectively, from components of the proposed project. The onshore portions of potentially active faults in the Monterey-Tularcitos and the Reliz-Rinconada Fault Zones pass beneath the proposed new Transmission Main. These potentially active faults or segments of faults are not zoned under the Alquist-Priolo Earthquake Fault Zone (see Section 4.2.2, Regulatory Framework, below).

Seismic Groundshaking

As discussed above (Section 4.2.1.2), the WGCEP estimated that a major earthquake has a 72 percent chance of affecting the project vicinity in the next 30 years and would produce strong groundshaking throughout the region (WGCEP, 2015a, b). Earthquakes on active or potentially active faults, depending on magnitude and distance from the project area, could produce a range of groundshaking intensities at the project area. Historically, earthquakes have caused strong groundshaking and damage in the San Francisco Bay Area. However, disregarding local variations in ground conditions, the intensity of shaking at different locations within the area can generally be expected to decrease with distance from an earthquake source.

The primary tool that seismologists use to describe groundshaking hazard is a probabilistic seismic hazard assessment (PSHA). The PSHA for the State of California takes into consideration the range of possible earthquake sources (including such worst-case scenarios as described above) and estimates their characteristic magnitudes to generate a probability map for groundshaking. The PSHA maps depict PGA value of that have a 10 percent probability of being exceeded in 50 years (i.e., a 1 in 475 chance of occurring each year). Use of this probability level allows engineers to design structures to withstand ground motions that have a 90 percent chance of *not* occurring in the next 50-year interval, thus making buildings safer than if they were designed only for the ground motions that are expected within the next 50 years.

In 2008, the USGS and the CGS updated the model by introducing new parameters and updated fault locations (CGS, 2008a). **Table 4.2-5** summarizes the estimated PGAs (10 percent probability of being exceeded in 50 years) at various project components.

As shown on Figure 4.2-1, the majority of the project components would be constructed on fill or alluvial materials; PGAs for fill and alluvial materials were estimated to range from 0.361 g to 0.418 g. The Main System-Hidden Hills Interconnection Improvements would be located in a largely bedrock area with a PGA of 0.320. Using American Society of Civil Engineers (ASCE) Standard 7-10 design criteria, the geotechnical investigation for the desalination plant estimated the PGA could be as high as 0.562 (Zinn, 2014). As listed in **Table 4.2-2**, the estimated range of PGAs equates to Modified Mercalli groundshaking intensities of VII (strong) to VIII (very strong).

TABLE 4.2-5
SUMMARY OF ESTIMATED PEAK GROUND ACCELERATIONS AT PROPOSED FACILITY LOCATIONS

Proposed Project Component	PGA
Subsurface slant wells	0.390 g
MPWSP Desalination Plant	CGS estimate: 0.398 g Zinn calculation; 0.562 g
Northern terminus of Castroville Pipeline	0.418 g
ASR-5 and ASR-6 Wells	0.371 g
Ryan Ranch-Bishop Interconnection Improvements	0.362 g
Main System-Hidden Hills Interconnection Improvements	0.320 g
Carmel Valley Pump Station	0.361 g

NOTE: g = percentage of the acceleration due to gravity

SOURCE: CGS, 2008b; Zinn, 2014

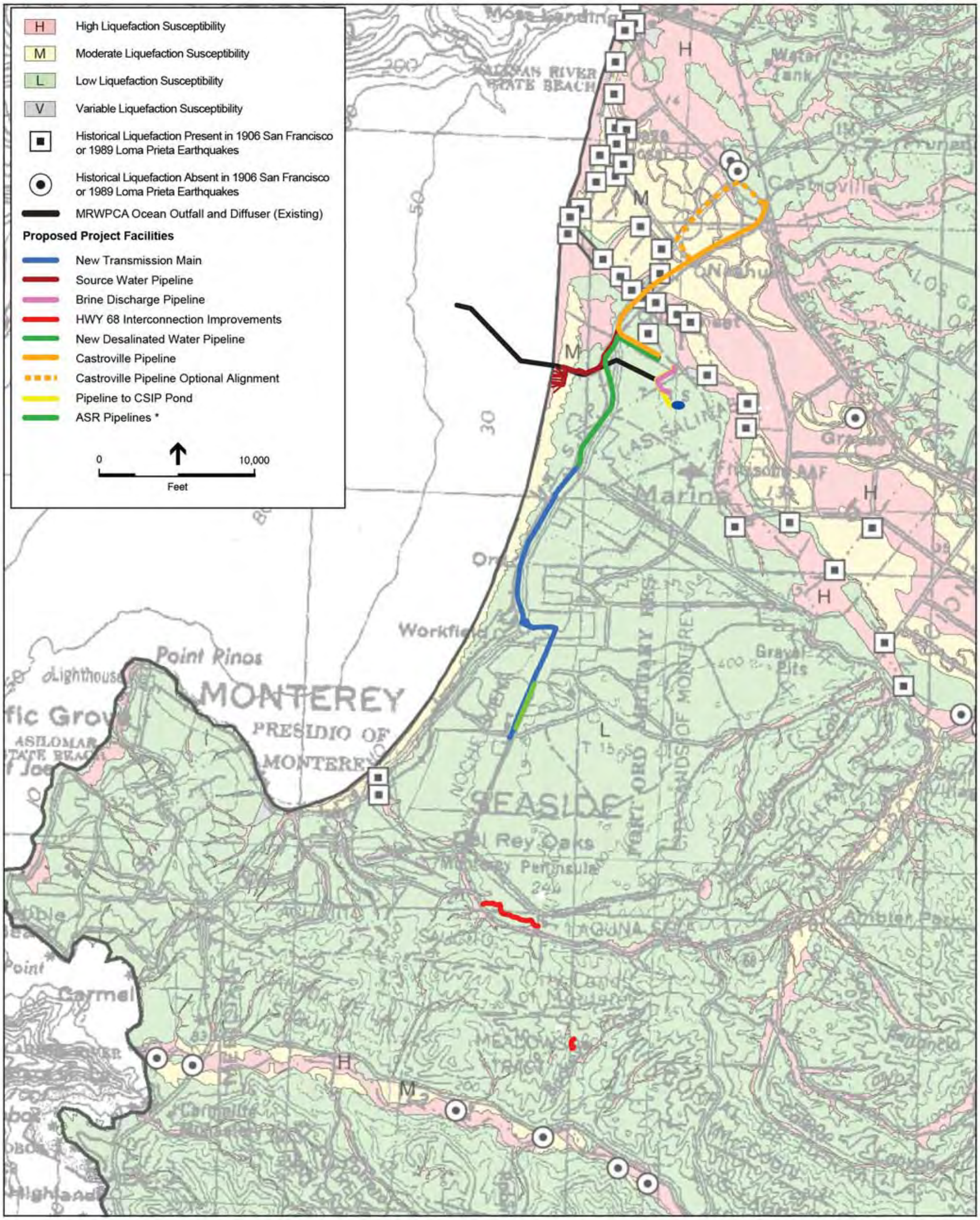
Liquefaction and Lateral Spreading

Liquefaction is the rapid loss of shear strength experienced in saturated, predominantly granular soils below the groundwater level during strong earthquake groundshaking and occurs due to an increase in pore water pressure. Liquefaction-induced lateral spreading is defined as the finite, lateral displacement of gently sloping ground as a result of pore-pressure buildup or liquefaction in a shallow underlying deposit during an earthquake (VT, 2013). The occurrence of this phenomenon is dependent on many complex factors, including the intensity and duration of groundshaking, particle-size distribution, and density of the soil.

The potential damaging effects of liquefaction include differential settlement, loss of ground support for foundations, ground cracking, heaving and cracking of structure slabs due to sand boiling[17], and buckling of deep foundations due to ground settlement. Dynamic settlement (i.e., pronounced consolidation and settlement from seismic shaking) may also occur in loose, dry sands above the water table, resulting in settlement of and possible damage to overlying structures. In general, a relatively high potential for liquefaction exists in loose, sandy soils that are within 50 feet of the ground surface and are saturated (below the groundwater table). Lateral spreading can move blocks of soil, placing strain on buried pipelines that can lead to leaks or pipe failure (VT, 2013).

Figure 4.2-5 presents the relative liquefaction hazard potential in Monterey County in the vicinity of the proposed project, with liquefaction susceptibility designations (high, moderate, low, and variable) adapted by Ninyo & Moore (2005) from the *Monterey County General Plan*. Sites with a designation of “low” are considered to have the lowest potential for liquefaction hazards, and sites with a designation of “high” are considered to have the highest potential for liquefaction because of the soil type (sand) and probable groundwater depths.

[17] Sand boiling occurs when water pressure caused by an earthquake causes sand and water to “boil” to the surface.



SOURCE: Ninyo & Moore, 2005

205335.01 Monterey Peninsula Water Supply Project

Figure 4.2-5
Liquefaction Potential

Some locations in the project area, including the floodplain of the Salinas River and other smaller drainage areas, have a moderate to high liquefaction potential. During the 1989 Loma Prieta earthquake, liquefaction caused settlement and ground cracking in the Moss Landing area about 2 miles north of the proposed MPWSP Desalination Plant site, damaging roads and the approach to the bridge linking Moss Landing to the mainland. Over 30 separate locations of historical liquefaction incidents have been documented in the project vicinity, the majority of which were in the northern portion of the project area near the Salinas River. The proposed Castroville Pipeline crosses into the larger Salinas floodplain area, passing through an area of moderate to high potential for liquefaction. The proposed location for the Carmel Valley Pump Station is mapped as having a moderate to high liquefaction potential. The areas mapped with a moderate to high potential for liquefaction are also in drainage areas where the water table could be seasonally higher during the rainy season, which contributes to the increased potential.

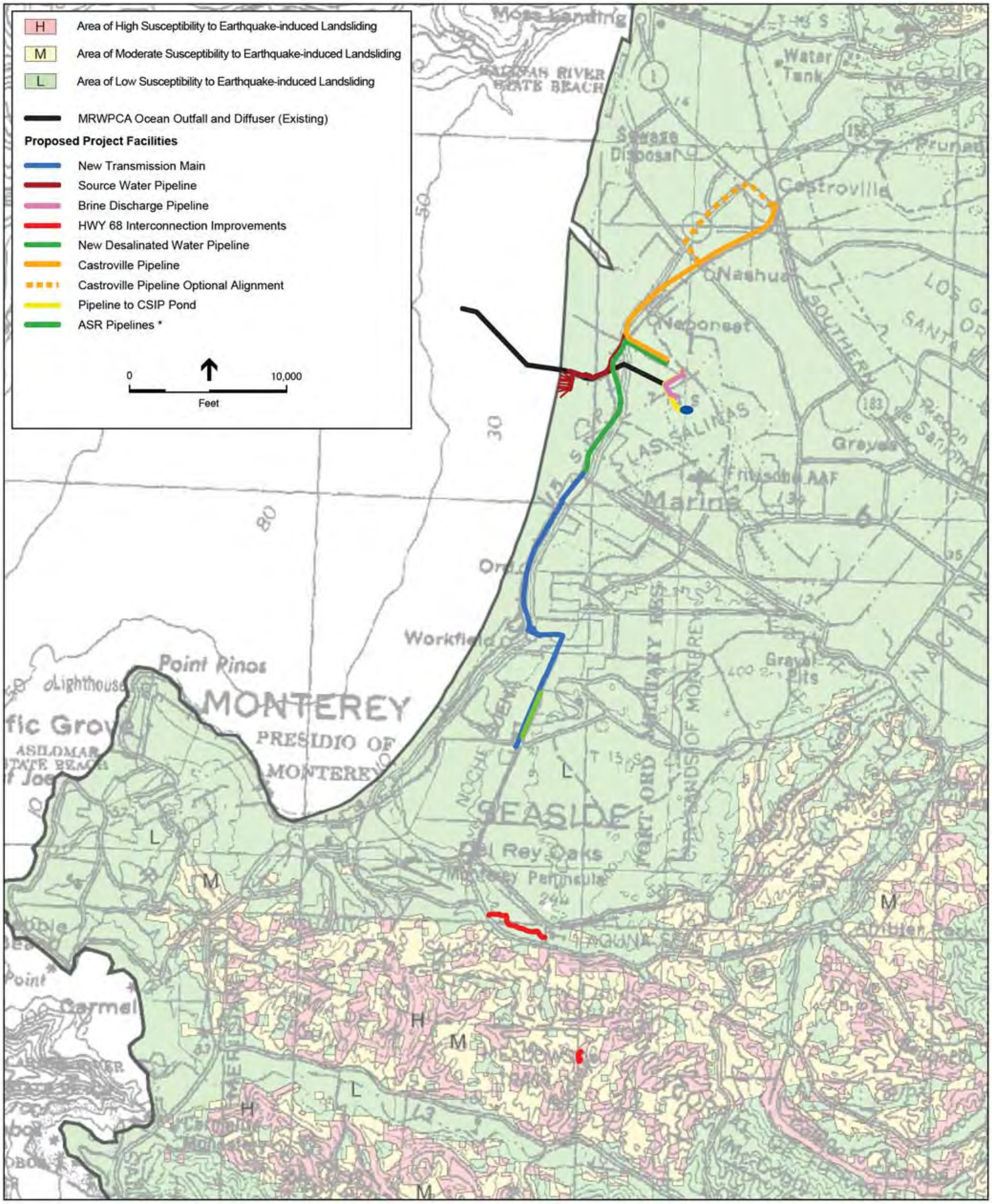
Earthquake-Induced Settlement

Settlement of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid rearrangement, compaction, and settling of subsurface materials, particularly loose, non-compacted, and variable sandy sediments (PCE, 2014). Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Areas are susceptible to differential settlement if underlain by compressible sediments, such as poorly engineered artificial fill. Earthquake-induced settlement could occur in the event of an earthquake and is a potential seismic hazard discussed further in Section 4.2.5, Direct and Indirect Effects of the Proposed Project.

Landslides and Ground Cracking

Earthquake motions can induce substantial stresses on slopes and can cause earthquake-induced landslides or ground cracking if the slope fails. Earthquake-induced landslides can occur in areas with steep slopes that are susceptible to strong ground motion during an earthquake. The 1989 Loma Prieta earthquake on the San Andreas Fault triggered thousands of landslides over an area of 5,400 square miles. **Figure 4.2-6** presents the seismically-induced landslide hazard potential in the project vicinity based on a map from the *Monterey County General Plan*, as adapted by Ninyo & Moore (2005). The figure characterizes landslide susceptibility as high, moderate, and low. Because the steepness of topography is a major factor in the potential for landslides, **Figure 4.2-6** provides insight into areas prone to non-seismically induced landslides. Non-seismically induced landslide can be caused by the force of gravity on steep unstable slopes, by construction activities that disturb soil conditions and create unstable slopes, and by water leaks or breaks in pipelines or pumps.

Potential landslide hazards are present in the hillside terrain on and east of the Monterey Peninsula. All but one of the project components would be located in relatively flat to gently sloping topography and would therefore have a low susceptibility to landslides; the proposed Main System-Hidden Hills Interconnection Improvements are located in an area mapped as having a moderate to high susceptibility to landslides.



SOURCE: Ninyo & Moore, 2005

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Figure 4.2-6
Landslide Hazard Map

4.2.2 Regulatory Framework

This section provides an overview of federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as "regulatory requirements") relevant to geology, soils, and seismicity. A brief summary of each is provided, along with a finding regarding the project's consistency with those regulatory requirements. The consistency analysis is based on the project as proposed, without mitigation. Where the project, as proposed, would be consistent with the applicable regulatory requirement, no further discussion of project consistency with that regulatory requirement is provided. Where the project, as proposed, would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to the specific impact discussion in Section 4.2.5, Direct and Indirect Effects of the Proposed Project, below, where the potential inconsistency is addressed in more detail. Where applicable, the discussion in Section 4.2.5 identifies feasible mitigation that would resolve or minimize the potential inconsistency.

4.2.2.1 Federal Regulations

Federal Occupational Safety and Health Administration Regulations

The Occupational Safety and Health Administration's (OSHA) Excavation and Trenching standard, Title 29 of the Code of Federal Regulations (CFR), Part 1926.650, covers requirements for excavation and trenching operations. OSHA requires that all excavations in which employees could potentially be exposed to cave-ins be protected by sloping or benching the sides of the excavation, supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area. These regulations apply to the project because of the proposed construction and trenching activities. All contractors are required to comply with OSHA regulations, which would make the proposed project consistent with OSHA.

4.2.2.2 State Regulations

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) provides for the long-term management of lands within California's coastal zone boundary. Of primary relevance to geology, soils, and seismicity are Coastal Act policies concerning construction altering natural shorelines and minimizing risk to life and property in areas of high geologic, flood, and fire hazard. A preliminary assessment of project consistency with these priorities is provided below. Final determinations regarding project consistency are reserved for the Coastal Commission. MPWSP subsurface slant wells would be potentially inconsistent with Coastal Act policies. The slant wells would be located along the coast within an area that is subject to erosion which, when considered in the context of sea level rise, will ultimately cause shoreline retreat to the location of the above-ground portions of the MPWSP subsurface slant wells. Exposure of these project components on the beach could alter natural shoreline processes, which would be inconsistent with Coastal Act policies. Similarly, such exposure would subject these project components to increased risk of damage due to flood and wave action, and contribute to beach erosion, which would also be inconsistent with Coastal Act policies. These issues are discussed further in Impact 4.2-10.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to protect structures for human occupancy from the hazard of surface faulting. In accordance with the Act, the State Geologist has established regulatory zones—called earthquake fault zones—around the surface traces of active faults, and has published maps showing these zones. Buildings for human occupancy cannot be constructed across surface traces of faults that are determined to be active. Because many active faults are complex and consist of more than one branch that may experience ground surface rupture, earthquake fault zones extend approximately 200 to 500 feet on either side of the mapped fault trace. Although a number of faults in the area are known to be active, as discussed above in Section 4.2.1.2, none of the faults passing beneath project components have been formally mapped by the state as being within an Alquist-Priolo Earthquake Fault Zone. The Alquist-Priolo Earthquake Fault Zoning Act does not apply to the proposed project because the State of California has not zoned under the Alquist-Priolo Act, the active and potentially active faults that intersect the project components.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was passed in 1990 following the Loma Prieta earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones, and cities, counties, and other local permitting agencies to regulate certain development projects within these zones. For projects that would locate structures for human occupancy within designated Zones of Required Investigation, the Seismic Hazards Mapping Act requires project applicants to perform a site-specific geotechnical investigation to identify the potential site-specific seismic hazards and corrective measures, as appropriate, prior to receiving building permits. The *CGS Guidelines for Evaluating and Mitigating Seismic Hazards* (Special Publication 117A) provides guidance for evaluating and mitigating seismic hazards (CGS, 2008). The CGS is in the process of producing official maps based on USGS topographic quadrangles, as required by the Act. To date, the CGS has not completed delineations for any of the USGS quadrangles in which project components are proposed.

California Building Code

The California Building Code (CBC), which is codified in Title 24 of the California Code of Regulations, Part 2, was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards related to structural strength, means of egress to facilities (entering and exiting), and general stability of buildings. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under State law, all building standards must be centralized in Title 24 or they are not enforceable. The provisions of the CBC apply to the construction, alteration, movement, replacement, location, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The 2016 edition of the CBC is based on the 2015 International Building Code (IBC) published by the International Code Council. The code is updated triennially, and the 2016 edition of the CBC was published by the California Building Standards Commission on July 1, 2016, and takes effect starting January 1, 2017. The 2016 CBC contains California amendments based on the American Society of Civil Engineers (ASCE) Minimum Design Standard ASCE/SEI 7-10, *Minimum Design Loads for Buildings and Other Structures*, provides requirements for general structural design and includes means for determining earthquake loads[18] as well as other loads (such as wind loads) for inclusion into building codes. Seismic design provisions of the building code generally prescribe minimum lateral forces applied statically to the structure, combined with the gravity forces of the dead and live loads of the structure, which the structure then must be designed to withstand. The prescribed lateral forces are generally smaller than the actual peak forces that would be associated with a major earthquake. Consequently, structures should be able to: (1) resist minor earthquakes without damage, (2) resist moderate earthquakes without structural damage but with some nonstructural damage, and (3) resist major earthquakes without collapse, but with some structural as well as nonstructural damage. Conformance to the current building code recommendations does not constitute any kind of guarantee that significant structural damage would not occur in the event of a maximum magnitude earthquake. However, it is reasonable to expect that a structure designed in-accordance with the seismic requirements of the CBC should not collapse in a major earthquake.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients, all of which are used to determine a seismic design category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site; SDC ranges from A (very small seismic vulnerability) to E/F (very high seismic vulnerability and near a major fault). Seismic design specifications are determined according to the SDC in accordance with Chapter 16 of the CBC. Chapter 18 of the CBC covers the requirements of geotechnical investigations (Section 1803), excavation, grading, and fills (Section 1804), load-bearing of soils (1806), as well as foundations (Section 1808), shallow foundations (Section 1809), and deep foundations (Section 1810). For Seismic Design Categories D, E, and F, Chapter 18 requires analysis of slope instability, liquefaction, and surface rupture attributable to faulting or lateral spreading, plus an evaluation of lateral pressures on basement and retaining walls, liquefaction and soil strength loss, and lateral movement or reduction in foundation soil-bearing capacity. It also addresses measures to be considered in structural design, which may include ground stabilization, selecting appropriate foundation type and depths, selecting appropriate structural systems to accommodate anticipated displacements, or any combination of these measures. The potential for liquefaction and soil strength loss must be evaluated for site-specific peak ground acceleration magnitudes and source characteristics consistent with the design earthquake ground motions.

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[18] A load is the overall force to which a structure is subjected in supporting a weight or mass, or in resisting externally applied forces. Excess load or overloading may cause structural failure.

Chapter 18 also describes analysis of expansive soils and the determination of the depth to groundwater table. Expansive soils are defined in the CBC as follows:

> **1803.5.3 Expansive Soil**. In areas likely to have expansive soil, the building official shall require soil tests to determine where such soils do exist. Soils meeting all four of the following provisions shall be considered expansive, except that tests to show compliance with Items 1,2 and 3 shall not be required if the test prescribed in Item 4 is conducted:
>
> 1. Plasticity index (PI) of 15 or greater, determined in accordance with ASTM D 4318
> 2. More than 10 percent of the soil particles pass a No. 200 sieve (75 micrometers), determined in accordance with ASTM D 422
> 3. More than 10 percent of the soil particles are less than 5 micrometers in size, determined in accordance with ASTM D 422
> 4. Expansion index greater than 20, determined in accordance with ASTM D 4829

The design of the proposed project is required to comply with CBC requirements, which would make the proposed project consistent with the CBC.

California Excavation Notification Requirements

California Code of Regulations Section 4216 requires that construction contractors report a project that involves excavation 48-hours prior to breaking ground. This program allows owners of buried installations to identify and mark the location of its facilities before any nearby excavation projects commence. Adherence to this law by contractors of projects reduces the potential of inadvertent pipeline and utility damage and leaks. All contractors are required to comply with California excavation notification requirements, which would make the proposed project consistent with California excavation notification requirements.

California Occupational Safety and Health Administration Regulations

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the workplace. In California, the California Division of Occupational Safety and Health (Cal/OSHA) and the federal OSHA are the agencies responsible for ensuring worker safety in the workplace.

The OSHA Excavation and Trenching standard (29 CFR 1926.650), described above in Section 4.2.2.1, Federal Regulations, covers requirements for excavation and trenching operations, which are among the most hazardous construction activities. OSHA requires that all excavations in which employees could potentially be exposed to cave-ins be protected by sloping or benching the sides of the excavation, supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area. Cal/OSHA is the implementing agency for both state and federal OSHA standards. All contractors are required to comply with OSHA regulations, which would make the proposed project would be consistent with OSHA.

NPDES Construction General Permit

Construction associated with the proposed project would disturb more than one acre of land surface potentially affecting the quality of stormwater discharges into waters of the U.S. The proposed project would therefore be subject to the *NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities* (Order 2009-0009-DWQ, NPDES No. CAS000002, Construction General Permit; as amended by Orders 2010-0014-DWQ and 2012-006-DWQ). The Construction General Permit regulates discharges of pollutants in stormwater associated with construction activity to waters of the U.S. from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface. The permit regulates stormwater discharges associated with construction or demolition activities, such as clearing and excavation; construction of buildings; and linear underground projects (LUP), including installation of water pipelines and other utility lines.

Portions of the proposed project would fall under the Type 1 LUP category if the following conditions are met:

a) Construction occurs on unpaved improved roads, including their shoulders or land immediately adjacent to them;

b) The areas disturbed during a single construction day are returned to their preconstruction condition, or to an equivalent condition (i.e., disturbed soils such as those from trench excavation are hauled away, backfilled into the trench, and/or placed in spoils piles and covered with plastic), at the end of that same day;

c) Vegetated areas disturbed by construction activities are stabilized and revegetated at the end of the construction period; and

d) When required, adequate temporary soil stabilization best management practices (BMPs) are installed and maintained until vegetation has reestablished to meet the permit's minimum cover requirements for final stabilization.

The Construction General Permit requires that construction sites be assigned a Risk Level of 1 (low), 2 (medium), or 3 (high), based both on the sediment transport risk at the site and the receiving waters risk during periods of soil exposure (e.g., grading and site stabilization). The sediment risk level reflects the relative amount of sediment that could potentially be discharged to receiving water bodies and is based on the nature of the construction activities and the location of the site relative to receiving water bodies. The receiving waters risk level reflects the risk to the receiving waters from the sediment discharge. The Construction General Permit contains requirements for Risk Levels 1, 2 and 3, and the LUP Type 1, 2, and 3 categories. If a project does not meet any one or more of the aforementioned conditions under the Type 1 LUP category, depending on its location within a sensitive watershed area or floodplain, the level of receiving water risk could be considered low, medium, or high. Depending on the Risk Level, the construction projects could be subject to the following Construction General Permit requirements:

- Effluent standards
- Good site management "housekeeping"
- Non-stormwater management
- Erosion and sediment controls
- Runon and runoff controls
- Inspection, maintenance, and repair
- Monitoring and reporting requirements

The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes specific BMPs designed to prevent pollutants from contacting stormwater and keep all products of erosion from moving offsite into receiving waters. The SWPPP BMPs are intended to protect surface water quality by preventing the offsite migration of eroded soil and construction-related pollutants from the construction area. Routine inspection of all BMPs is required under the provisions of the Construction General Permit. In addition, the SWPPP is required to contain a visual monitoring program, a chemical monitoring program for non-visible pollutants, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

The SWPPP must be prepared before the construction begins. The SWPPP must contain a site map(s) that delineates the construction work area, existing and proposed buildings, parcel boundaries, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the project area. The SWPPP must list BMPs and the placement of those BMPs that the applicant would use to protect stormwater runoff. Examples of typical construction BMPs include scheduling or limiting certain activities to dry periods, installing sediment barriers such as silt fence and fiber rolls, and maintaining equipment and vehicles used for construction. Non-stormwater management measures include installing specific discharge controls during certain activities, such as paving operations and vehicle and equipment washing and fueling. The Construction General Permit also sets post-construction standards (i.e., implementation of BMPs to reduce pollutants in stormwater discharges from the site following construction).

In the project area, the Construction General Permit is implemented and enforced by the Central Coast RWQCB, which administers the stormwater permitting program. Dischargers are required to electronically submit a notice of intent (NOI) and permit registration documents (PRDs) in order to obtain coverage under this Construction General Permit. Dischargers are responsible for notifying the RWQCB of violations or incidents of non-compliance, as well as for submitting annual reports identifying deficiencies of the BMPs and how the deficiencies were corrected.

The permit contains several additional compliance items, including: (1) additional mandatory BMPs to reduce erosion and sedimentation, which may include vegetated swales, setbacks and buffers, rooftop and impervious surface disconnection, bioretention cells, rain gardens, rain cisterns, implementation of pollution/sediment/spill control plans, training, and other structural and nonstructural actions; (2) sampling and monitoring for non-visible pollutants; (3) effluent monitoring and annual compliance reports; (4) development and adherence to a Rain Event Action Plan; (5) requirements for post-construction; (6) numeric action levels and effluent limits for pH and turbidity; (7) monitoring of soil characteristics onsite; and (8) mandatory training under a specific curriculum.

The proposed project would be required to comply with the permit requirements to control stormwater discharges from the construction sites. To obtain coverage under the Construction General Permit, CalAm would be required to electronically file the NOI along with the PRDs, the SWPPP, risk assessment, site map, signed certification statement, and other compliance-related documents required by the Construction General Permit using the Stormwater Multiple Applications and Report Tracking Systems, along with the appropriate permit fee to State Water Resources Control Board (SWRCB). The risk assessment and SWPPP must be prepared by a state-qualified SWPPP Developer and implementation of the SWPPP must be overseen by a state-qualified SWPPP Practitioner. The proposed project would be required to obtain coverage under the Construction General Permit and therefore the proposed project would be consistent.

4.2.2.3 Applicable Land Use Plans, Policies, and Regulations

Table 4.2-6 summarizes the pertinent regional and local land use plans, policies, and regulations that were adopted for the purpose of avoiding or mitigating an environmental effect and indicates project consistency with such plans, policies, and regulations. Where the analysis concludes the proposed project is consistent with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes the proposed project is potentially inconsistent with the applicable plan, policy, or regulation, the reader is referred to the specific impact discussion in Section 4.2.5, Direct and Indirect Effects of the Project (Proposed Action). In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

TABLE 4.2-6
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GEOLOGY, SOILS, AND SEISMICITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone & inland area)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.99:*** New development shall be permitted in areas of high seismic risk only when adequate engineering and design measures can be implemented in accordance with a geotechnical investigation and report.	This policy is intended to reduce risks to people and property associated with seismic hazards.	<u>Consistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports. Water conveyance pipelines would be constructed using standards from the American Water Works Association.
City of Marina (coastal zone & inland area)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.102.1:*** Ensure that critical or sensitive facilities, e.g., hospitals, fire and police stations, schools, major transportation links, high-occupancy structures, emergency communication facilities, utility lines, and sites containing or storing hazardous materials, are located, designed and operated to maximize their ability to remain functional after the expected or maximum credible event on any of the local active fault systems. Critical facilities shall not be located in areas of high to very high seismic shaking hazard.	This policy is intended to ensure that emergency or vital public facilities are able to withstand a major seismic event.	<u>Consistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes. Water conveyance pipelines would be constructed using standards from the American Water Works Association.
City of Marina (coastal zone & inland area)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.102.2:*** Require that new development be sited and designed to conform to site topography and to minimize grading wherever possible. Recommendations to developers as to how to mitigate geologic or seismic hazards should include mention of the need to avoid massive grading or excavation or structures that might require substantial alteration of natural landforms.	This policy is intended to minimize topographic alteration that could increase risks of geologic or seismic hazards.	<u>Consistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes. Water conveyance pipelines would be constructed using standards from the American Water Works Association.
City of Marina (coastal zone & inland area)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.102.4:*** Where new development is proposed within 300 feet of active dune fields, require that the geotechnical report include an assessment of dune migration rates and recommend appropriate setbacks.	This policy is intended to ensure that development would neither contribute to dune erosion nor encroach on migrating dunes.	<u>Potentially Inconsistent:</u> The slant wells would be located along the coast within an active dune area that will over time be eroded by sea level rise. This issue is addressed in **Impact 4.2-10**.
City of Marina (coastal zone & inland area)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.124.1:*** The City shall continue to require erosion-control and landscape plans for all new subdivisions or major projects on sites with potentially high erosion potential. Such plans should be prepared by a licensed civil engineer or other appropriately certified professional and approved by the City Public Works Director prior to issuance of a grading permit. All erosion control plans shall incorporate Best Management Practices to protect water quality and minimize water quality impacts and shall include a schedule for the completion of erosion- and sediment-control structures, which ensures that all such erosion-control structures are in place by mid-October of the year that construction begins. Site monitoring by the applicant's erosion-control specialist should be undertaken, and a follow-up report should be prepared that documents the progress and/or completion of required erosion-control measures both during and after construction is completed.	This policy is intended to minimize new development soil erosion and associated water quality impacts.	<u>Consistent:</u> As discussed in the Regulatory Framework, the project would be required to comply with the Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion, and the project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.
City of Marina (coastal zone)	City of Marina Local Coastal Program Land Use Plan	Planning Guidelines, Geotechnical	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Geotechnical:*** • Structural development shall not be allowed on the ocean-side of the dunes, in the area subject to wave erosion in the next 50 years, or in the tsunami run-up zone. The only exception to this would be essential support facilities to a coastally dependent industry, and in these areas the City will not undertake any liability for property damage due to hazards. • Because of the fragile character of the dune vegetation, new development in this area shall be restricted to already-disturbed areas. Development in areas where the natural dune remains shall not alter the basic configuration of the natural dune landform, and shall provide for site reclamation. • To reduce wind erosion, disturbed areas not being actively used by coastal dependent industries should be revegetated with native plants. Revegetation will be required of all new development on the dunes. • Before development is permitted in the Coastal Zone, a geotechnical report appropriate to the specific proposal shall be prepared for that development in the dunes or in the vicinity of any vernal pond. The report shall include at least geologic and seismic stability, liquefaction potential, identification of an appropriate hazard setback to protect the economic life of structures, and specific recommendations on drainage, irrigation and mitigation of identified problems.	This policy is intended to protect life and property from wave erosion, wind erosion, tsunami inundation, and shaking from earthquakes.	<u>Potentially Inconsistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes. However, the construction of the slant wells and Source Water Pipeline could affect dune vegetation. This issue is addressed in Impact 4.2-1. In addition, the slant wells would be located along the coast within an active dune area that will over time be eroded by sea level rise. This issue is addressed in **Impact 4.2-10**.

TABLE 4.2-6 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GEOLOGY, SOILS, AND SEISMICITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
Fort Ord Dunes State Park	Fort Ord Dunes State Park General Plan and Environmental Impact Report	Physical Resources	New Transmission Main	**GEO-1:** Exclude construction of new facilities and permanent structures in areas expected to be subject to coastal erosion within 100 years of construction (a maximum of approximately 700 feet). Exceptions may be allowed for roads, trails, and other facilities that may be considered expendable. Existing facilities may remain in use subject to periodic health and safety inspections.	This policy is intended to protect new development from coastal erosion.	Consistent: The new Transmission Main would not be located within the area anticipated to be subject to coastal erosion over the next 100 years.
City of Seaside (coastal zone & inland area)	Seaside General Plan	Safety	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline	***Policy S.1-1:*** Reduce the risk of impacts from seismic and geologic hazards. *Implementation Plan S-1.1.1: CEQA:* Assess development proposals for potential seismic and geologic hazards pursuant to the California Environmental Quality Act (CEQA). Require studies of soil and geologic conditions by state licensed Engineering Geologists and Civil Engineers where appropriate. When potential geologic impacts are identified, require project applicants to mitigate the impacts per the recommendations contained within the soil and geologic studies. If substantial geologic/seismic hazards cannot be mitigated, require the development to be relocated or redesigned to avoid the significant hazards. *Implementation Plan S-1.1.2: Building Codes.* As new versions of building and construction codes are released, adopt and enforce the most recent codes. Specifically, to minimize damage from earthquakes and other geologic activity, implement the most recent State and seismic requirements for structural design of new development and redevelopment.	This policy is intended to protect people and property from seismic and geologic hazards.	Consistent: The EIR/EIS assesses seismic and geologic hazards and identifies mitigation measures. As discussed in the Regulatory Framework, project components must be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports. Water conveyance pipelines would be constructed using standards from the American Water Works Association.
City of Seaside	Seaside Municipal Code	Title 15 Buildings and Construction	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline	***Chapter 15.32 Standards to Control Excavation, Grading, Clearing and Erosion:*** When required by the city engineer, each application for a permit shall be accompanied by two sets of supporting data consisting of a soil and/or civil engineering report and/or engineering geology report, and/or any other reports necessary. B. The civil engineering report shall include hydrological calculations of runoff for ten-year and one-hundred year storm frequencies; conclusions and recommendations for adequate erosion control and grading procedures, comparison of runoff without and with project; design criteria for corrective measures, including the existing and/or required safe storm drainage capacity outlet of channels both onsite and offsite; and opinions and recommendations covering adequacy of the site to be developed by the proposed grading. The City shall require developers to prepare and implement erosion control plans prepared by a registered civil engineer or an approved erosion controls specialist" means a person who has a certificate of qualifications and is recognized by the city engineer as capable of preparing erosion control and grading plans and shall be subject to the approval of the City Engineer. The erosion component of the plan must at least meet the requirements of Storm Water Pollution Prevention Plans (SWPPPs) required by the California State Water Resources Control Board.	These standards are intended to minimize erosion resulting from excavation, grading, and clearing.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.
County of Monterey (coastal zone & inland area)	Monterey County Code	Chapter 16.08 – Grading	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Chapter 16.08:*** The Monterey County Grading Ordinance generally regulates grading activities that involve more than 100 cubic yards of excavation and fill. Minor fills and excavations ("cuts") of less than 100 cubic yards that are not intended to provide foundations for structures, or that are very shallow and nearly flat, are typically exempt from the ordinance, as are shallow footings for small structures. Submittal requirements for a County grading permit include site plans, existing contours and proposed contour changes, an estimate of the volume of earth to be moved, and geotechnical (soils) reports. Grading activities that involve over 5,000 cubic yards of soil must include detailed plans signed by a state-licensed civil engineer. Grading is not allowed to obstruct storm drainage or cause siltation of a waterway. All grading requires implementation of temporary and permanent erosion-control measures. Grading within 50 feet of a watercourse, or within 200 feet of a river, is regulated in the Monterey County Zoning Ordinance floodplain regulations. The Monterey County Grading Ordinance requires a soil engineering and engineering geology report (Section 16.08.110: Permit – Soil Engineering and Engineering Geology Reports [Ordinance 4029, 1999; Ordinance 2534, Section 110, 1979], unless waived by the Building Official because information of record is available showing such data is not needed. The soil engineering and engineering geology report must include the following: a. Data regarding the properties, distribution and strength of existing soils	This ordinance is intended to minimize soil erosion, and loss of topsoil, and associated environmental effects.	Consistent: As discussed in the Regulatory Framework, project components must be constructed in compliance with the California Building Code, county codes, and city codes, which require soils and geologic reports and grading permits. The Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion. Water conveyance pipelines would be constructed using standards from the American Water Works Association.

TABLE 4.2-6 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GEOLOGY, SOILS, AND SEISMICITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone & inland area) (cont.)				b. Recommendations for grading and corrective measures for project design, as appropriate c. An adequate description of the geology of the site and potential hazards. The recommendations from the soil engineering and engineering geology report must be incorporated in the grading plans and construction specifications.		
County of Monterey (coastal zone & inland area)	Monterey County Code	Chapter 16.12 – Erosion Control	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Section 16.12:*** The Monterey County Erosion Control Ordinance requires project applicants to implement runoff control measures and avoid creek disturbance; regulates land clearing; and prohibits grading activities during winter. The ordinance generally prohibits development on slopes greater than 30 percent. The Monterey County Director of Building Inspection enforces the ordinance, under which applicants must complete an erosion control plan.	This section is intended to minimize erosion and soil loss, and associated water quality impacts, among other environmental effects.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-3.1:*** Best Management Practices (BMPs) to prevent and repair erosion damage shall be established and enforced.	This policy is intended to minimize erosion and soil loss, and associated water quality impacts, among other environmental effects.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-3.3:*** Criteria for studies to evaluate and address, through appropriate designs and BMPs, geologic and hydrologic constraints and hazards conditions, such as slope and soil instability, moderate and high erosion hazards, and drainage, water quality, and stream stability problems created by increased stormwater runoff, shall be established for new development and changes in land use designations.	This policy is intended to minimize development-related impacts on people, property, and water quality associated with hydrologic and geologic hazards.	Consistent: As discussed in the Regulatory Framework, project components must be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports. The Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion. Water conveyance pipelines would be constructed using standards from the American Water Works Association.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy S-1.1:*** Land uses shall be sited and measures applied to reduce the potential for loss of life, injury, property damage, and economic and social dislocations resulting from groundshaking, liquefaction, landslides, and other geologic hazards in the high and moderate hazard susceptibility areas.	This policy is intended to protect people and property from seismic and geologic hazards.	Consistent: As discussed in the Regulatory Framework, project components must be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-	***Policy S-1.3:*** Site-specific geologic studies may be used to verify the presence or absence and extent of the hazard on the property proposed for new development and to identify mitigation measures for any development proposed. An ordinance including permit requirements relative to the siting and design of structures and grading relative to seismic hazards shall be established.	This policy is intended to protect people and property from seismic and geologic hazards.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.

TABLE 4.2-6 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GEOLOGY, SOILS, AND SEISMICITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
			Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station			
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy S-1.4:*** The Alquist-Priolo Earthquake Fault Zoning Act shall be enforced.	This policy is intended to protect people and property from seismic hazards, such as those resulting from fault rupture.	<u>Consistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports. Water conveyance pipelines would be constructed using standards from the American Water Works Association.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy S-1.5:*** Structures in areas that are at high risk from fault rupture, landslides, or coastal erosion shall not be permitted unless measures recommended by a registered engineering geologist are implemented to reduce the hazard to an acceptable level.	This policy is intended to protect people and property from hazards associated with fault rupture, landslides, or coastal erosion.	<u>Potentially Inconsistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports. However, the slant wells would be located along the coast within an active dune area that will over time be eroded by sea level rise. This issue is addressed in **Impact 4.2-10**.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy S-1.6:*** New development shall not be permitted in areas of known geologic or seismic hazards unless measures recommended by a California certified engineering geologist or geotechnical engineer are implemented to reduce the hazard to an acceptable level. Areas of known geologic or seismic hazards include: a. Moderate or high relative landslide susceptibility. b. High relative erosion susceptibility. c. Moderate or high relative liquefaction susceptibility. d. Coastal erosion and sea cliff retreat. e. Tsunami run-up hazards.	This policy is intended to protect people and property from geologic and seismic hazards.	<u>Potentially Inconsistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports. However, the slant wells would be located along the coast within an active dune area that will over time be eroded by sea level rise. This issue is addressed in **Impact 4.2-10**.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy S-1.7:*** Site-specific reports addressing geologic hazard and geotechnical conditions shall be required as part of the planning phase and review of discretionary development entitlements and as part of review of ministerial permits in accordance with the California Building Standards Code as follows: a. Geotechnical reports prepared by State of California licensed Registered Geotechnical Engineers are required during building plan review for all habitable structures and habitable additions over 500 square feet in footprint area. Additions less than 500 square feet and non-habitable buildings may require geotechnical reports as determined by the pre-site inspection. b. A Registered Geotechnical Engineer shall be required to review and approve the foundation conditions prior to plan check approval, and if recommended by the report, shall perform a site inspection to verify the foundation prior to approval to pour the footings. Setbacks shall be identified and verified in the field prior to construction. c. All new development and subdivision applications in State- or County designated Earthquake Fault Zones shall provide a geologic report addressing the potential for surface fault rupture and secondary fracturing adjacent to the fault zone before the application is considered complete. The report shall be prepared by a Registered Geologist or a Certified Engineering Geologist and conform to the State of California's most current guidelines for evaluating the hazard of surface fault rupture.	This policy is intended protect people and property from geologic hazards, such as fault rupture, secondary fracturing, landslides, or liquefaction.	<u>Consistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports. Water conveyance pipelines would be constructed using standards from the American Water Works Association.

TABLE 4.2-6 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GEOLOGY, SOILS, AND SEISMICITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone & inland area) (cont.)				d. Geologic reports and supplemental geotechnical reports for foundation design shall be required in areas with moderate or high landslide or liquefaction susceptibility to evaluate the potential on- and offsite impacts on subdivision layouts, grading, or building structures. e. Where geologic reports with supplemental geotechnical reports determine that potential hazards affecting new development do not lead to an unacceptable level of risk to life and property, development in all Land Use Designations may be permissible, so long as all other applicable General Plan policies are complied with. f. Appropriate site-specific mitigation measures and mitigation monitoring to protect public health and safety, including deed restrictions, shall be required.		
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy S-1.8:*** As part of the planning phase and review of discretionary development entitlements, and as part of review of ministerial permits in accordance with the California Building Standards Code, new development may be approved only if it can be demonstrated that the site is physically suitable and the development would neither create nor significantly contribute to geologic instability or geologic hazards.	This policy is intended to protect people and property from geologic hazards (e.g., liquefaction, landslides).	<u>Consistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports. Water conveyance pipelines would be constructed using standards from the American Water Works Association.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy S-1.9:*** A California licensed civil engineer or a California licensed landscape architect can recommend measures to reduce moderate and high erosion hazards in the form of an Erosion Control Plan.	This policy is intended to minimize erosion hazards.	<u>Consistent:</u> As discussed in the Regulatory Framework, the project would be required to comply with the Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion.
County of Monterey (coastal zone)	North County Land Use Plan	Geologic Hazards	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.8.3.A1:*** All development shall be sited and designed to conform to site topography and to minimize grading and other site preparation activities.	This policy is intended to minimize landform alteration and associated environmental effects.	<u>Consistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports, which would include measures to minimize hazards caused by grading and other site activities. Water conveyance pipelines would be constructed using standards from the American Water Works Association.
County of Monterey (coastal zone)	North County Land Use Plan	Geologic Hazards	Source Water Pipeline and new Desalinated Water Pipeline	**Policy *2.8.3.A2:*** All structures, with the exception of utility lines where no alternative route is feasible, shall be sited a minimum of 50 feet from an active fault or potentially active fault. Greater setbacks may be required where it is warranted by local geologic conditions.	This policy is intended to minimize impacts on utility infrastructure from seismic hazards.	<u>Consistent:</u> The Source Water Pipeline does not cross or come within 50 feet of a potentially active fault. There are no alternative routes for the new Desalinated Water Pipeline that would not cross the trace of a potentially active fault.
County of Monterey (coastal zone)	North County Land Use Plan	Geologic Hazards	Source Water Pipeline, new Desalinated Water Pipeline,	***Policy 2.8.3.A4:*** Soils and geologic reports shall be required for all new land divisions and for construction of structures and roads on slopes exceeding 30 percent or in areas of known or suspected geologic hazards. Evaluations of potential onsite and offsite impacts shall be included in the report.	This policy is intended to protect people and property from geologic hazards.	<u>Consistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports
County of Monterey (coastal zone)	North County Land Use Plan	Geologic Hazards	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.8.3.A5:*** Where soils and geologic reports are required, they should include a description and analysis of the following items: a. geologic conditions, including soil, sediment, and rock types and characteristics in addition to structural features, such as bedding, joints, and faults; b. evidence of past or potential landslide conditions, the implications of such conditions for the proposed development, and the potential effects of the development on landslide activity;	This policy Is intended to protect people and property from geologic hazards.	<u>Consistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports

TABLE 4.2-6 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GEOLOGY, SOILS, AND SEISMICITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone) (cont.)				c. impact of construction activity on the stability of the site and adjacent area; d. ground and surface water conditions and variations, including hydrologic changes caused by the development (i.e., introduction of sewage effluent and irrigation water to the groundwater system; alterations in surface drainage); e. potential erodibility of site and mitigating measures to be used to minimize erosion problems during and after construction (i.e., landscaping and drainage design). f. potential effects of seismic forces resulting from a maximum credible earthquakes; g. any other factors that might affect slope stability.		
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline	***Soils and Geology Policy A-4:*** The City shall continue to enforce the Uniform Building Code to minimize erosion and slope instability problems.	This policy is intended to minimize erosion and slope instability.	<u>Consistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline	***Soils and Geology Policy A-5:*** Before issuing a grading permit, the City shall require that geotechnical reports be prepared for developments proposed on soils that have limitations as substrates for construction or engineering purposes, including limitations concerning slope and soils that have piping, low-strength, and shrink-swell potential. The City shall require that engineering and design techniques be recommended and implemented to address these limitations.	The policy is intended to protect people and property from geologic hazards, including soil instability.	<u>Consistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline	***Soils and Geology Policy A-6:*** The City shall require that development of lands having a prevailing slope above 30% include implementation of adequate erosion control measures.	This policy is intended to minimize the erosion impacts of new development.	<u>Consistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Safety	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline	***Seismic and Geologic Hazards Policy A-2:*** The City shall use the development review process to ensure that potential seismic or geologic hazards are evaluated and mitigated prior to construction of new projects. ***Program A-2.1:*** The City shall require geotechnical reports and seismic safety plans when development projects or other area plans are proposed within zones that involve high or very high seismic risk. Each plan shall be prepared by a certified geotechnical engineer and shall be subject to the approval of the Planning Director for the City of Seaside. ***Program A-2.2:*** Through site monitoring, the City shall ensure that all measures included in the project's geotechnical and seismic safety plans are properly implemented and a report shall be filed and on public record prepared by the Planning Director and/or Building Inspector confirming such. ***Program A-2.3:*** The City shall continue to updated and enforce the Uniform Building Code to minimize seismic hazards impacts from resulting from earthquake induced effects such as groundshaking, ground rupture, liquefaction, and or soils problems.	This policy is intended to protect people and property from seismic and geologic hazards.	<u>Consistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Soils and Geology Policy A-2:*** The County shall require developers to prepare and implement erosion control and landscape plans for projects that involve high erosion risk. Each plan shall be prepared by a registered civil engineer or certified professional in the field of erosion and sediment control and shall be subject to the approval of the public works director for the City of Marina. The erosion component of the plan must at least meet the requirements of Storm Water Pollution Prevention Plans (SWPPPs) required by the California State Water Resources Control Board.	This policy is intended to minimize erosion resulting from new development.	<u>Consistent:</u> As discussed in the Regulatory Framework, the project would be required to comply with the Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Soils and Geology Policy A-3:*** Through site monitoring, the County shall ensure that all measures included in the developer's erosion control and landscape plans are properly implemented.	The policy is intended to minimize erosion resulting from new development.	<u>Consistent:</u> As discussed in the Regulatory Framework, the project would be required to comply with the Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Soils and Geology Policy A-4:*** The County shall continue to enforce the Uniform Building Code to minimize erosion and slope instability problems.	This policy is intended to minimize erosion and slope instability.	<u>Consistent:</u> As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which are based on the Uniform Building Code.

TABLE 4.2-6 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GEOLOGY, SOILS, AND SEISMICITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Soils and Geology Policy A-5:*** Before issuing a grading permit, the County shall require that geotechnical reports be prepared for developments proposed on soils that have limitations as substrates for construction or engineering purposes, including limitations concerning slope and soils that have piping, low-strength, and shrink-swell potential. The County shall require that engineering and design techniques be recommended and implemented to address these limitations.	The policy is intended to protect people and property from geologic hazards, including soil instability.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Soils and Geology Policy A-6:*** The County shall require that development of lands having a prevailing slope above 30% include implementation of adequate erosion control measures.	This policy is intended to minimize the erosion impacts of new development.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Safety	Ryan Ranch–Bishop Interconnection Improvements	***Seismic and Geologic Hazards Policy A-2:*** The County shall use the development review process to ensure that potential seismic or geologic hazards are evaluated and mitigated prior to construction of new projects. ***Program A-2.1:*** The County shall require geotechnical reports and seismic safety plans when development projects or other area plans are proposed within zones that involve high or very high seismic risk. Each plan shall be prepared by a certified geotechnical engineer and shall be subject to the approval of the Planning Director for the County of Monterey. ***Program A-2.2:*** Through site monitoring, the County shall ensure that all measures included in the project's geotechnical and seismic safety plans are properly implemented and a report shall be filed and on public record prepared by the Planning Director and/or Building Inspector confirming such. ***Program A-2.3:*** The County shall continue to update and enforce the Uniform Building Code to minimize seismic hazards impacts from resulting from earthquake induced effects such as groundshaking, ground rupture, liquefaction, and or soils problems.	This policy is intended to protect people and property from seismic and geologic hazards.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports, and are based on the Uniform Building Code.

SOURCES: California State Parks, 2004; City of Marina, 2006, 2013; City of Seaside, 2004, 2013; FORA, 1997; Monterey County, 1999, 2010.

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4.2.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to geology, soils, and seismicity if it would:

- Expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
  - Strong seismic groundshaking;
  - Seismic-related ground failure, including liquefaction and lateral spreading;
  - Landslides;
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the MPWSP, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on problematic soils such as expansive or corrosive soils;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater;
- Accelerate and/or exacerbate natural rates of coastal erosion, scour, or dune retreat, resulting in damage to adjoining properties or a substantial change in the natural coastal environment; or
- Degrade the physical structure of any geologic resource, or alter any oceanographic process, such as sediment transport, such that it is measurably different from pre-existing conditions.

CEQA requires analysis of a project's effects on the environment; consideration of the potential effects of a site's environment on a project are outside the scope of required CEQA review (*California Building Industry Association v. Bay Area Air Quality Management District* (2015) 62 Cal. 4th 369). As stated in *Ballona Wetlands Land Trust v. City of Los Angeles* (2011) 201 Cal.App.4th 455, 473: “[T]he purpose of an EIR is to identify the significant effects of a project on the environment, not the significant effects of the environment on the project.” The impacts discussed in this section related to increased exposure of people or structures to risks associated with seismic occurrences and location of people or structures on unstable geologic units are effects on users of the project and structures in the project of preexisting environmental hazards, and therefore “do not relate to environmental impacts under CEQA and cannot support an argument that the effects of the environment on the project must be analyzed in an EIR.” (*Id.* at p. 474.) Nonetheless, an analysis of these impacts is provided for information purposes.

4.2.4 Approach to Analysis

Geologic and seismic information for the project area was derived from various sources and compiled in this chapter to develop a comprehensive understanding of the potential constraints and hazards associated with project construction and operations. Information sources include regional geologic maps prepared by the CGS and USGS, the PSHA of California, and earthquake rupture forecasts developed by the WGCEP, all of which reflect the most up-to-date understanding of the regional geology and seismicity. In addition, geologic and seismic analysis relied on project-specific geotechnical studies and a project-specific coastal erosion study that was designed to evaluate the risk of coastal erosion that would result from future sea level rise and 100-year storm events.

As described in more detail below, the analysis of geologic and seismic impacts in this section takes into account that CalAm would incorporate into their facility designs the engineering recommendations provided by the various geotechnical studies conducted for the proposed project. The analysis also considers the various existing state and local regulations that apply to geotechnical design and construction, which include the CBC and the Monterey County ordinances for building and grading. Through compliance with the existing ordinances, CalAm would be required to demonstrate that the proposed site uses are compatible with the subsurface geology and local seismic conditions; this must occur before building permits are issued. Additionally, CalAm would require its pipeline engineers and construction contractors to adhere to the American Water Works Association (AWWA) standards for pipeline design and construction; this analysis considers that in evaluating potential geologic and seismic impacts.

4.2.4.1 Geotechnical Investigations for Project Facilities

This analysis used geotechnical information and data derived from project-specific geotechnical studies, including geotechnical investigations conducted for the proposed MPWSP Desalination Plant at Charles Benson Road (PCE, 2014; Zinn, 2014) and the conveyance pipelines (AECOM, 2015), as well as a geotechnical investigation conducted to support CalAm's previously proposed Coastal Water Project (Ninyo & Moore, 2005). This analysis also utilized information from the preliminary geotechnical study completed by Ninyo & Moore (2014) for the Groundwater Replenishment Project EIR.

Geotechnical studies are essential for facility and pipeline design because it is the information that informs the structural design of the project components and determines whether the geologic materials underlying the project components are capable of supporting the proposed uses without risk of detrimental effects from potential hazards associated with problematic soils, liquefaction, or excessive seismic shaking. Geotechnical investigations are required under the CBC for most structures intended for human occupancy and by the Monterey County Grading Ordinance. Based on field observation and laboratory testing, the geotechnical engineer can assess whether the soils are adequate to support the structure under static (non-earthquake) or earthquake conditions. If corrective work is necessary to remedy the problem soils or otherwise unstable ground condition, the geotechnical engineer would recommend approaches to correct the condition. Geotechnical engineering recommendations are typically standard engineering practices that have been proven elsewhere to increase the geotechnical performance of an underlying soil or bedrock material. CalAm would incorporate all geotechnical recommendations set forth by the project geotechnical engineer.

4.2.4.2 American Water Works Association Standards for Proposed Pipelines

Pipelines are constructed to various industry standards. The AWWA is a worldwide nonprofit scientific and educational association that, among its many activities, establishes recommended standards for the construction and operation of public water supply systems, including standards for pipe and water treatment facility materials and sizing, installation, and facility operations. While the AWWA's recommended standards are not enforceable code requirements, they nevertheless can dictate how pipelines for water conveyance are designed and constructed. CalAm has committed to requiring its contractors to incorporate AWWA Standards into the design and construction of the proposed pipelines.

4.2.4.3 Seismic Considerations

In California, an earthquake can cause injury or property damage by: (1) rupturing the ground surface, (2) violently shaking the ground, (3) causing the underlying ground to fail due to liquefaction, or (4) causing enough ground motion to initiate slope failures or landslides, any of which could damage or destroy structures.

State and local code requirements ensure buildings and other structures are designed and constructed to withstand major earthquakes, thereby reducing the risk of collapse and the associated risks to human health and safety and private property. The code requirements have been developed through years of study of earthquake response and the observed performance of structures during significant local earthquakes (e.g., the 1989 Loma Prieta Earthquake) and others around the world. As discussed in Section 4.2.2, Regulatory Framework, the proposed project would be required to comply with federal, state, and local laws regulating construction. The laws ensure that proposed development sites are adequately investigated and that seismic hazards are evaluated and addressed in the project design and construction. These laws include the Seismic Hazards Mapping Act, the California Building Code, and Monterey County ordinances pertaining to excavation, grading, and site development in geologic hazard zones. The *CGS Guidelines for Evaluating and Mitigating Seismic Hazards* (Special Publication 117A) (CGS, 2008b) provides guidance for evaluating and mitigating seismic hazards as required by the Public Resources Code Section 2695(a).

Site-specific geotechnical investigations are conducted to determine the presence of problematic soils and identify seismic hazards on a subject site. These investigations identify the geologic and seismic setting of a subject site and provide feasible engineering recommendations to remedy potentially adverse soil and seismic conditions. For projects whose grading activities would move over 5,000 cubic yards of soil, the Monterey County Grading Ordinance requires that a site-specific geotechnical investigation (i.e., soil engineering and engineering geology report) be completed prior to final design in order to obtain a building or grading permit.[19]

Site-specific geotechnical investigations also provide the necessary soil information required by structural engineers to ensure structures and buildings are designed appropriately to withstand earthquake ground motion. Grading plans, foundation designs, and structural designs are prepared based on the geotechnical recommendations presented in the site-specific geotechnical investigation and other pertinent requirements of the CBC.

4.2.4.4 Site-Specific Soil Borings and Monitoring Wells

CalAm consultants drilled several exploratory borings at the CEMEX mining facility to depths of 306 to 350 feet below ground surface, logged the subsurface materials encountered, and collected soil and groundwater samples for laboratory testing. The exploratory boring logs, field screening tests results, and laboratory analytical results are presented in *Technical Memorandum (TM 1) - Summary of Results - Exploratory Boreholes* (Geoscience, 2014). The exploratory work, as described in the Setting above and in Section 4.4, Groundwater Resources, further defined the subsurface geology in the CEMEX active mining area (the proposed site for the subsurface slant wells). While this work was intended to refine groundwater modeling parameters, it also benefits the geology impact analysis.

CalAm consultants installed Monitoring Wells MW-1, and MW-3 through MW-7 at the locations shown on **Figure 4.4-9** and presented the results in *Technical Memorandum (TM2) Monitoring Well Completion Report and CEMEX Model Update, Monterey Peninsula Water Supply Project, Hydrogeologic Investigation* (Geoscience, 2016).[20] These are nested wells with screened intervals in the Dune Sand Aquifer, 180-Foot Equivalent Aquifer, and the 400-Foot Aquifer. The exploratory work, as described in detail in Section 4.4, Groundwater Resources, further defined the subsurface geology and aquifers at the proposed site for the subsurface slant wells. While this work was also intended to refine groundwater modeling parameters, it similarly benefits the geology impact analysis.

The pertinent data gathered from the exploratory work is incorporated, where appropriate, into Sections 4.2.5.1 and 4.2.5.2, below.

4.2.4.5 Coastal Retreat Study

The proposed project would place the seawater intake system along the Monterey Bay coastline. Sea level is predicted to rise over the next century and, in response, coastal erosion is expected to accelerate. The rise in sea level and the resultant increased coastal erosion rate would migrate the beach inland. Depending on the rate of coastal erosion and beach migration, the beach could migrate inland to the locations of the well heads for the slant wells within the project lifetime. The well heads and upper portions of the slant wells would then be exposed to wave action, storm events, and rip embayments, processes that are described above in Sea Level Rise and Coastal

[19] Unless the investigation is deemed unnecessary by the Building Official due to existing information.
[20] The consultant concluded that the planned Monitoring Well MW-2 was unnecessary and not installed.

Erosion. See also **Figure 4.3-3**, Areas Subject to Sea Level Rise in the Project Area, in Section 4.3, Surface Water Hydrology and Water Quality, for more information. The presence of structures on the beach changes the beach dynamics and can result in scour and erosion in the localized area. In turn, these changes can affect the volumes of sand on beaches both at the structure locations and at other beach locations in areas where the coastal drift would otherwise provide sand and maintain sandy beaches. In the case of Monterey Bay, coastal drift is typically to the south and this process provides sand to maintain the sand supply on those beaches.

To evaluate coastal erosion impacts associated with project components proposed in the coastal zone, a project-specific coastal retreat study — *Analysis of Historic and Future Coastal Erosion with Sea Level Rise* — was conducted by a team of licensed coastal engineers and coastal geomorphologists (ESA, 2014). The findings and recommendations of the study inform the analysis of Impact 4.2-10, below. The coastal retreat study is included as **Appendix C2** of this EIR/EIS.

The coastal retreat study examined coastal processes to determine the likelihood for the slant wells and their well heads to become exposed before the end of their usable lifespan. The study estimated coastal retreat both laterally and vertically. The lateral extent of erosion was evaluated using coastal erosion hazard zones; the vertical extent was evaluated using coastal profiles. Both of these methods are described in more detail below.

Coastal Erosion Hazard Zones (Lateral Erosion Estimates)

A coastal erosion hazard zone represents an area where erosion (caused by coastal processes) has the potential to occur over a certain time period. Within any area of such a zone, there is a risk of damage due to erosion during a major storm event. Actual locations of erosion during a particular storm depend on the unique characteristics of that storm (e.g. wave direction, surge, rainfall, and coincident tide). The coastal hazard zones are developed from three components: historic erosion, additional erosion due to sea level rise, and the potential erosion impact caused by a large storm wave event (e.g., 100-year storm event). As sea level rises, higher mean sea level will increase the frequency of wave run-up, thereby undercutting the dune toe and increasing erosion.

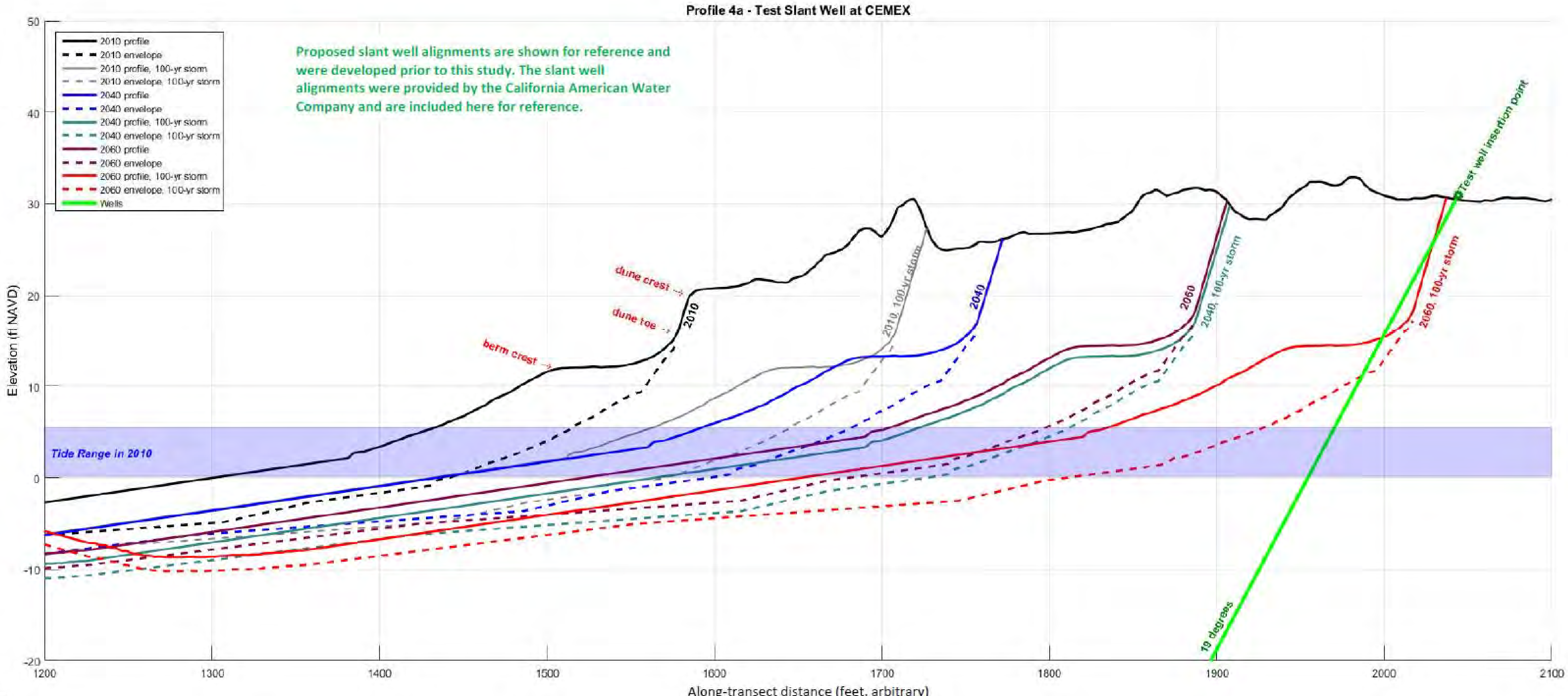
The most important variables in the coastal erosion model are the historic erosion trend, backshore toe elevation, and the total water level. The historic erosion rate was applied to a planning horizon through 2100 to determine the erosion rates that would occur without the project. The erosion model does not account for shore management actions, such as sand placement, that could potentially mitigate future shore recession. In this region, where beaches are controlled in part by sand mining, the study assumed there would be no changes to existing sand mining practices.

The potential for shoreline retreat caused by sea level rise and the impact from a large storm event was estimated using a geometric model of dune erosion and applied with different slopes to make the model more applicable to sea level rise. This method is consistent with the Federal Emergency Management Agency (FEMA) Pacific Coast Flood Guidelines. The potential shoreline retreat estimates account for uncertainty in the duration of future storm events. Instead of predicting storm-specific characteristics and response, the method assumes that the coast would erode or retreat to a maximum storm wave event with unlimited duration. This is a conservative approach to estimating the impact of a 100-year storm event.

Coastal Profile (Vertical Erosion Estimates)

The coastal profile analysis developed a set of representative profiles that show how the shoreline is likely to evolve from the present to 2040 and 2060, and shows the locations of selected project components relative to those profiles. As previously discussed, the Monterey Bay shoreline is affected by seasonal changes, localized erosion (rip currents), long-term erosion, and sea level rise. Each of these factors is important in defining the profile shape and location at a given time. For this reason, the analysis identified a projected future profile and an extremely eroded profile (lower envelope) for each future time horizon. The future profile is the current profile eroded at the historic rate, with added erosion caused by sea level rise. The lower profile envelope represents a highly eroded condition, which could occur from a combination of localized erosion (rip currents), a large winter storm, and seasonal changes. The upper envelope (a highly accreted profile) was not analyzed because the key concern for the project is that buried or inland project components would become exposed over time. There are two profile/envelope combinations for each time step: one to represent long term profile evolution (historic erosion and accelerated erosion from sea level rise) and another that adds potential erosion from a 100-year storm event, which could be as high as much as 100 feet.

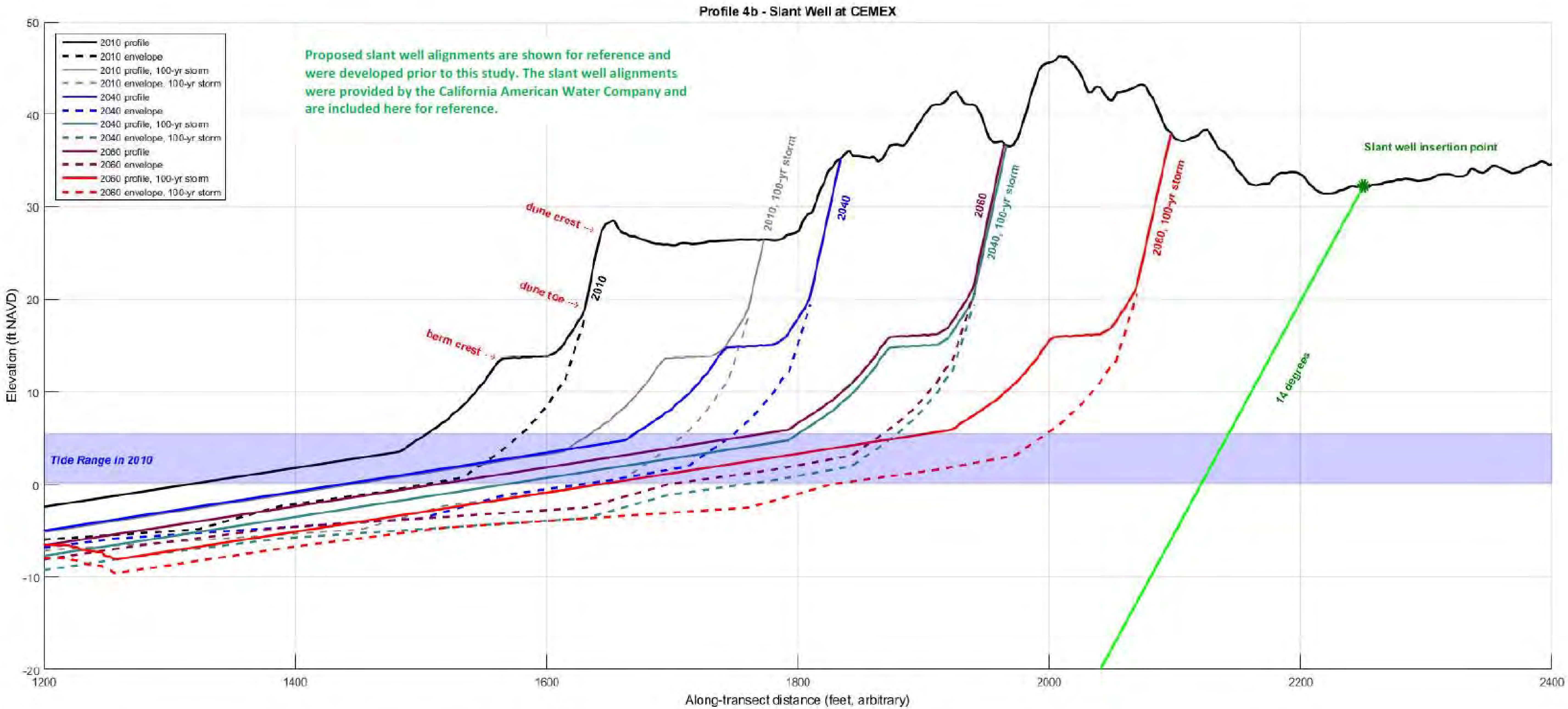
The high and low rates of sea level rise were estimated for each year from 2012 to 2073, the time period for which input data was needed by the groundwater modeling efforts discussed in Section 4.4, Groundwater Resources. The coastal erosion hazard zones maps delineate the estimated areas along the coast expected to be at or below sea level by the years 2030, 2040, 2050, 2060, and 2100, and thus subject to erosive wave action. Coastal profiles were then prepared at various locations to show the current (2010) profile and estimate the coastal profiles in 2040 and 2060, where project components would be close to the coastline and potentially subject to the damage that would be the result of coastal retreat. The test slant well would be exposed as a result of the 100-year storm event in the year 2060, as shown on **Figure 4.2-7**. The initially-proposed locations for the other nine slant wells would have been about the same distance from MHW and would have been within the anticipated extent of coastal retreat. These initial slant well locations are shown on the coastal profiles in Appendix C2. To avoid this condition, the well heads for the other nine slant wells were relocated to a line south of the existing test slant well, so that the proposed new slant wells would be located inland of the effects of the 100-year storm event in the year 2060, as shown on **Figure 4.2-8**.



Notes:

1. These envelopes of erosion consider seasonal changes in beach width, localized erosion (rip currents), long-term erosion, and accelerated erosion caused by sea level rise.
2. The profile shape is linearly interpolated between the bathymetry data and the topography data (between x = 919 ft and x = 1385).
3. This profile is located immediately south of the CEMEX Pacifica Lapis sand mining plant. No data is available to quantify the uncertainty in adjacent beach and dune erosion related to sand mining activities. The potential for fluctuations in beach width associated with sand mining were not considered in this analysis.
4. Slant well location and angle are based on the "Geological Cross Section through Test Slant Well" drawing provided by Geoscience on January 7 2016.

Figure 4.2-7
Representative Profile at Test Slant Well



Notes:

1. These envelopes of erosion consider seasonal changes in beach width, localized erosion (rip currents), long-term erosion, and accelerated erosion caused by sea level rise.
2. The profile shape is linearly interpolated between the bathymetry data and the topography data (between x = 820 ft and x = 1480).
3. This profile is located immediately south of the CEMEX Pacifica Lapis sand mining plant. No data is available to quantify the uncertainty in adjacent beach and dune erosion related to sand mining activities. The potential for fluctuations in beach width associated with sand mining were not considered in this analysis.
4. Slant well location and angle are based on the "Cross-Section SW-3" drawing provided by Geoscience on January 7, 2016.

Figure 4.2-8
Representative Profile at Proposed Slant Wells

4.2.5 Direct and Indirect Effects of the Proposed Project

Table 4.2-7 summarizes the impacts and significance determinations related to geology, soils and seismicity that could result from implementation of the proposed project (10 slant wells at CEMEX). Due to the nature of the proposed project, the following criterion is not addressed in the impact analysis sections for the reasons described below:

> ***Degrade the physical structure of any geologic resource or alter any oceanographic process, such as sediment transport, such that it is measurably different from pre-existing conditions.*** Construction, operations, and maintenance of the components of the proposed project (10 wells at CEMEX) would not affect onshore or offshore geologic resources, and would not alter oceanographic processes because construction would be below the seabed; the seabed would not be altered and would not be disturbed during operations or maintenance activities.

TABLE 4.2-7
SUMMARY OF IMPACTS – GEOLOGY, SOILS, AND SEISMICITY

Impacts	Significance Determinations
Impact 4.2-1: Substantial soil erosion or loss of topsoil during construction.	LSM
Impact 4.2-2: Exposure of people or structures to substantial adverse effects related to fault rupture.	LS
Impact 4.2-3: Exposure of people or structures to substantial adverse effects related to seismically-induced groundshaking.	LS
Impact 4.2-**4**: Exposure of people or structures to substantial adverse effects related to seismically-induced ground failure, including liquefaction, lateral spreading, or settlement.	LS
Impact 4.2-5: Exposure of people or structures to substantial adverse effects related to landslides or other slope failures.	LS
Impact 4.2-6: Exposure of people or structures to substantial adverse effects related to expansive soils.	LS
Impact 4.2-7: Exposure of structures to substantial adverse effects related to corrosive soils.	LS
Impact 4.2-8: Exposure of people or structures to substantial adverse effects related to land subsidence.	NI
Impact 4.2-9: Exposure of people or structures to substantial adverse effects related to alternative wastewater disposal systems.	LS
Impact 4.2-10: Accelerate and/or exacerbate natural rates of coastal erosion, scour, or dune retreat, resulting in damage to adjoining properties or a substantial change in the natural coastal environment.	LSM
Impact 4.2-C: Cumulative impacts related to geology, soils, and seismicity.	LSM

NOTES:
NI = No Impact
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

4.2.5.1 Construction Impacts

Impact 4.2-1: Substantial soil erosion or loss of topsoil during construction. (*Less than Significant with Mitigation*)

Soil Erosion

All Proposed Project Components

Project construction would involve localized ground disturbance activities (e.g., grading, excavation, drilling, and the construction of structures and pipelines) associated with drilling of the subsurface slant wells and ASR injection/extraction wells, installation of pipelines, and construction of buildings and structures. These activities could result in substantial soil erosion.

The construction activities would involve short-term ground disturbance. As described above in Section 4.2.1, Setting/Affected Environment, many of the project facilities and all conveyance pipelines would be constructed in relatively flat areas with little topographic relief. The gentle topographic relief would minimize the potential for soil erosion during construction.

Because the overall footprint of construction activities would exceed 1 acre, the proposed project would be required to comply with the *NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities* (Order 2009-0009-DWQ, NPDES No. CAS000002; as amended by Orders 2010-0014-DWQ and 2012-006-DWQ) (Construction General Permit), the Monterey County Grading Ordinance, and Monterey County Erosion Control Ordinance, all of which are described in Section 4.2.2, Regulatory Framework. These state and local requirements were developed to ensure that stormwater is managed and erosion is controlled on construction sites. The Construction General Permit requires preparation and implementation of a SWPPP, also described in Section 4.2.2, which requires applications of BMPs to control run-on and runoff from construction work sites. The BMPs would include, but would not be limited to, physical barriers to prevent erosion and sedimentation, construction of sedimentation basins, limitations on work periods during storm events, use of bio-infiltration swales, protection of stockpiled materials, and a variety of other measures that would substantially reduce or prevent erosion from occurring during construction. The Monterey County Grading Ordinance, as well as similar city grading and erosion ordinances, requires implementation of temporary construction and permanent post-construction erosion control measures. The applicable erosion control ordinances restrict grading activities during winter months and require preparation of an erosion control plan prior to issuance of building permits.

Because project construction activities would be subject to the numerous requirements noted above and in Section 4.2.2, impacts associated with substantial increases in soil erosion during construction would be less than significant for all project components.

Loss of Topsoil

Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline, ASR-5 and ASR-6 Wells, and the Carmel Valley Pump Station

Several of the project-related construction activities would disturb vegetated areas, including sensitive natural vegetation communities. Grading, excavation, and backfill activities in these areas could result in the loss of topsoil (a fertile soil horizon that typically contains a seed base) if there is a well-developed topsoil horizon and it is mixed with other soil horizons or otherwise lost during excavation and backfilling. Impacts related to the loss of topsoil during construction of these components would be significant. However, the impact associated with loss of topsoil in sensitive natural communities would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)**. The impact associated with loss of topsoil on agricultural lands would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.16-1 (Minimize Disturbance to Farmland)**. These measures require that topsoil be salvaged, stockpiled separately from subsoils, and returned to its appropriate location in the soil profile during backfilling activities.

Subsurface slant wells, MPWSP Desalination Plant, Pipeline to CSIP Pond, Brine Discharge Pipeline/Brine Mixing Box, pipelines south of Reservation Road, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements

Surface soils at the subsurface slant wells and MPWSP Desalination Plant site are sandy and do not have a well-developed soil horizon. The site is covered in ruderal and disturbed habitat and does not support sensitive natural communities or crop production. The pipelines and interconnection improvements south of Reservation Road would be constructed within existing roadways and highly disturbed areas and would have no effect related to the loss of topsoil. Therefore, construction of the subsurface slant wells, MPWSP Desalination Plant and pipelines and interconnection improvements south of Reservation Road would have no impact related to loss of topsoil and no mitigation is necessary.

Consistency with Plans & Policies

As discussed above, the construction of the project has the potential to result in the loss of topsoil. This results in a potential inconsistency with the City of Marina Local Coastal Program Land Use Plan, as discussed above in Table 4.2-6. However, with implementation of **Mitigation Measure 4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)** and **Mitigation Measure 4.16-1 (Minimize Disturbance to Farmland)**, and through compliance with applicable laws and regulations, the potential for loss of topsoil during construction would be reduced to a less-than-significant level and the MPWSP would be brought into conformance with the above-noted plan.

Impact Conclusion

Impacts associated with soil erosion during construction would be less than significant for all project facilities. Impacts associated with loss of topsoil during construction would be significant for the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline, ASR-5 and ASR-6 Wells, and the Carmel Valley Pump Station. Implementation of **Mitigation Measures 4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)** and **4.16-1 (Minimize Disturbance on Farmland)** would reduce this impact to a less-than-significant level. No impact related to the loss of topsoil would result from construction of the subsurface slant wells, the MPWSP Desalination Plant or pipelines south of Reservation Road.

Mitigation Measures

Mitigation Measure 4.6-2b applies to the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline, ASR-5 and ASR-6 Wells, and the Carmel Valley Pump Station.

> **Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas.**
>
> (See Impact 4.6-2 in Section 4.6, Terrestrial Biological Resources, for the description.)

Mitigation Measure 4.16-1 applies to the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline.

> **Mitigation Measure 4.16-1: Minimize Disturbance to Farmland.**
>
> (See Impact 4.16-1 in Section 4.16, Agriculture and Forestry Resources, for the description.)

4.2.5.2 Operational and Facility Siting Impacts

The proposed project would not result in erosion-causing activities such as stormwater discharges to vegetated areas during project operations and maintenance because the project operations would be conducted entirely within the areas previously disturbed by construction of the project facilities and would not disturb any new areas. Therefore, project operations and maintenance would have no effect on erosion and topsoil.

Impact 4.2-2: Exposure of people or structures to substantial adverse effects related to fault rupture. (*Less than Significant*)

New Transmission Main and Ryan Ranch-Bishop Interconnection Improvements

The proposed project would not alter the seismic environment or increase the risk of fault rupture. None of the proposed facilities are located within an Alquist-Priolo Earthquake Fault Zone (i.e., on a State-recognized active fault trace). Although there is evidence of Holocene movement along some of the faults that cross the project area, these faults are unlikely to generate an earthquake or result in surface fault rupture because the segments with Holocene movement are concealed, do not exhibit any surface expression of fault movement, and/or are comparatively short (i.e., in comparison to an active fault such as the San Andreas Fault).

As shown on **Figures 4.2-1** and **4.2-4** and discussed in Section 4.2.1.2, the Monterey Bay–Tularcitos Fault Zone passes through the project area in Monterey, Del Rey Oaks, and Seaside. This fault zone creates a 6- to 9-mile wide zone of short in-echelon, northwest striking faults. These faults are not zoned under the Alquist-Priolo Earthquake Fault Zoning Act (see Regulatory Framework, Section 4.2.2) because they do not exhibit surface displacement that is younger than 11,000 years and are not considered sufficiently active or well defined. This distinction is discussed in more detail above in Section 4.2.1.2. From east to west, the individual faults in the Monterey Bay–Tularcitos Fault Zone are referred to as the:

- Chupines Fault Zone, Ord Terrace Fault, Del Rey Oaks section
- Chupines Fault Zone, Seaside Fault, Del Rey Oaks section
- Monterey Bay-Tularcitos Fault Zone, Monterey Bay section (Navy Fault)
- Monterey Bay-Tularcitos Fault Zone, Monterey Bay section (Hatton Canyon Fault)

Although these faults are not zoned by the State of California as active and the Fault Activity Map of California (Jennings, 2010) identifies these faults as older Quaternary-age faults (i.e. displacement between 1.6 mya to 11,000 ya or older), there has been evidence (Bryant, 2001) of Holocene displacement along the Hatton Canyon and Tularcitos Faults. Additionally, there is evidence of a probable offshore extension of the Chupines Fault displacing Holocene-age (less than 11,000 years old) deposits and sea floor sediments (Ninyo & Moore, 2014). Therefore, because there is evidence of Holocene–age displacement on certain segments of these otherwise Quaternary-aged and older faults, the potential for earthquake activity and possible ground surface displacement (ground rupture) cannot be dismissed. However, because the majority of these faults have not exhibited Holocene displacement and are not considered sufficiently active or well-defined, the potential is very low that the individual traces of these faults could generate an earthquake and result in surface fault rupture.

New Transmission Main

The proposed new Transmission Main would cross over the Reliz Fault Zone (Blanco Segment). The Reliz Fault Zone, Blanco Segment, is concealed and covered with dune sands along the coast and there is no reported evidence of Holocene-age fault displacement in this area.

In the event of an earthquake along the Reliz Fault Zone, groundshaking could occur, but because there has not been historic (less than 200 years) or Holocene (less than 11,000 years) activity on this fault, the active trace would be buried beneath sand and marine terrace deposits. In addition, because the fault segments are comparatively short (i.e., in comparison to an active fault such as the San Andreas Fault), any surface expression of fault movement would be minor if it would occur at all. In the unlikely event that the Reliz Fault Zone, Blanco Segment, generated earthquake activity or surface fault displacement along the New Transmission Pipeline, the pipeline would likely accommodate the lateral movement and not be damaged. If damage did occur, it would amount to a pipe break and possibly leakage that would be readily repaired, as previously explained. This impact is considered less than significant.

Ryan Ranch-Bishop Interconnection Improvements

The Ryan Ranch-Bishop Interconnection Improvements across the southern portion of the Chupines Fault Zone, Seaside Fault, and Del Rey Oaks section. The Chupines Fault in this area is mapped as a Quaternary fault with no evidence of recent or Holocene displacement. Considering its age and lack of recent activity, the potential for this fault to generate a damaging earthquake or rupture at the surface is considered low. In the unlikely event that the Hatton Canyon Fault generated earthquake activity or surface fault displacement, the pump station and pipeline would likely accommodate the lateral movement and not be damaged. If damage did occur, it would amount to a pipe break and possibly leakage that would be readily repaired, as previously explained. This impact is considered less than significant.

All Other Proposed Components

None of the other project components, including the subsurface slant wells and desalination plant, are close enough to known active faults to be vulnerable to surface fault rupture. Therefore, no impact would occur from implementation of the other project components.

Impact Conclusion

Mapped faults intersect the proposed new Transmission Main and the Ryan Ranch-Bishop Interconnection Improvements. These faults are not mapped as active by the State of California because they do not display evidence of recent displacement. However, past studies have identified that certain segments of these faults do exhibit Holocene-age displacement leading to the conclusion that certain segments could be considered active. While it is possible that these faults could generate an earthquake and rupture at the surface, the potential for such an occurrence to expose people or structures to substantial adverse effects related to fault rupture is low because the faults are either concealed beneath sediments or at a sufficient distance from the project components. In the unlikely event that one of the faults crossing the project components did generate an earthquake and cause surface rupture, the rupture area would be localized, resulting in a minor offset associated with a low level groundshaking. Damage could include localized pipeline leaks that would be immediately repaired. Considering the low potential for fault rupture on the project area faults, this impact is considered less than significant for the new Transmission Main and Ryan Ranch-Bishop Interconnection Improvements. For all other components of the proposed project, no impact would result because mapped faults do not occur at or near to the locations of the other components.

Mitigation Measures

None proposed.

Impact 4.2-3: Exposure of people or structures to substantial adverse effects related to seismically-induced groundshaking. (*Less than Significant*)

All Proposed Project Components

As discussed in Section 4.2.1, Setting, Monterey County will likely experience a large regional earthquake within the operational life of the MPWSP. There is a potential for high-intensity groundshaking associated with a characteristic earthquake in this region. The intensity of such an event would depend on the causative fault and the distance to the epicenter, the moment magnitude, the duration of shaking, and the nature of the geologic materials on which the MPWSP components would be constructed. Intense groundshaking and high ground accelerations would affect the entire area around the proposed facilities and associated pipelines. The primary and secondary effects of groundshaking could damage structural foundations, distort or break pipelines and other water conveyance structures, and cause structural failure.

The MPWSP Desalination Plant would be staffed full-time, and the Carmel Valley Pump Station would be staffed on an as-needed maintenance schedule. During operations, intense groundshaking could cause damage to these facilities, facility outages, and temporary water service disruptions in the CalAm Monterey District service area. Pumps could be rendered inoperable. Broken pipelines could result in soil washout and sinkholes that could damage nearby non-project facilities or the environment. Locating and repairing damaged pipelines and the pumps could require a cessation of operation of the facilities for a period of time. The 1989 Loma Prieta earthquake reportedly caused more than 60 water pipeline breaks in Santa Cruz, the nearest urbanized area to the epicenter (McNutt and Toppozada, 1990). As the proposed project would be part of an essential public utility (public water supply), repairs would be made promptly.

The structural elements of the proposed project would undergo appropriate design-level geotechnical evaluations prior to final design and construction. Implementing the regulatory requirements in the CBC and County ordinances and ensuring that all buildings and structures constructed in compliance with the law is the responsibility of the project engineers and building officials. The geotechnical engineer, as a registered professional with the State of California, is required to comply with the CBC and local codes while applying standard engineering practice and the appropriate standard of care for the particular region in California, which, in the case of the proposed MPWSP, is the Monterey Bay area.[21] The California Professional Engineers Act (Building and Professions Code Sections 6700-6799), and the Codes of Professional Conduct, as administered by the California Board of Professional Engineers and Land Surveyors, provides the basis for regulating and enforcing engineering practice in California. The local Building Officials are typically with the local jurisdiction (i.e. Monterey County) and are responsible for inspections and ensuring CBC and local code compliance prior to approval of the building permit.

[21] A geotechnical engineer (GE) specializes in structural behavior of soil and rocks. GEs conduct soil investigations, determine soil and rock characteristics, provide input to structural engineers, and provide recommendations to address problematic soils.

Impact Conclusion

It is likely that the structural elements of the proposed project would be subjected to a moderate to strong earthquake at least once during their operational life. Damage from an earthquake could result in temporary water service disruptions. However, because of the location of project facilities relative to the faults and the limited potential for ground surface rupture associated with these faults, there is a low potential for the groundshaking associated with an earthquake to cause injury, loss of life, or substantial property damage. Completion of a comprehensive design-level geotechnical investigation, adherence to the current CBC and local ordinances regulating construction, and the application of proven seismic design criteria that are standard engineering practice would ensure that structures are designed to withstand seismic events without sustaining substantial damage or collapsing. Therefore, this impact is considered less than significant.

Mitigation Measures

None proposed.

Impact 4.2-4: Exposure of people or structures to substantial adverse effects related to seismically-induced ground failure, including liquefaction, lateral spreading, or settlement. (*Less than Significant*)

Castroville Pipeline, Source Water Pipeline, and Carmel Valley Pump Station

The potential for liquefaction is higher in areas composed of granular soils with a shallow depth to groundwater. The potential damaging effects of liquefaction include differential settlement, loss of ground support for foundations, ground cracking, heaving and cracking of structure slabs due to sand boiling, and buckling of deep foundations due to liquefaction-induced ground settlement. The placement of structures on such soils could place the public at risk of injury or structures at risk of damage. Lateral spreading is the movement of blocks of soil on liquefiable soils.

Figure 4.2-5 shows the liquefaction hazard potential in Monterey County. As shown on the figure, most of the project components would be located in areas with a low susceptibility. However, the Castroville Pipeline would be constructed in areas of the Salinas River floodplain that have experienced documented historic liquefaction during the 1906 San Francisco and 1989 Loma Prieta earthquakes and are mapped with a moderate to high potential for liquefaction. The Source Water Pipeline is partially located on soils with a moderate to high potential for liquefaction. The Carmel Valley Pump Station is located on soils with a moderate liquefaction potential. Those project components located on or in soils with a moderate to high potential for liquefaction that could experience damage or failure as a result of liquefaction are discussed below.

The water conveyance pipelines would consist of 6- to 42-inch diameter pipelines buried from about 4 to 8 feet below the ground surface. Most of the conveyance pipelines would be underlain by deposits and fill materials consisting of dune sand and most of these deposits are anticipated to consist of dry sand and silt mixtures (Ninyo and Moore, 2005, 2014; AECOM, 2015). Fill materials likely consist of compacted mixtures of sand and silt generated locally from the natural dune deposits. Portions of the Source Water Pipeline close to and under the coastal areas could have shallow depths to groundwater; in this case seawater intruded from the ocean, and thus could be susceptible to liquefaction damage. Although not located in the coastal zone, the Carmel Valley Pump Station would be located on similarly sandy deposits near enough to the Carmel River to seasonally have shallow groundwater conditions.

As discussed above in the Section 4.2.3, Approach to Analysis, the proposed project components would undergo a final geotechnical investigation and be designed to resist damage from seismic shaking. CalAm would implement all geotechnical recommendations provided by the project geotechnical engineer if liquefiable soils are identified. Solutions to rectify liquefaction are modern engineering approaches used throughout California and are considered standard industry practice. Methods to correct liquefiable soils include removal and replacement of problematic soils, the use of pile foundations, and drainage columns to reduce saturated conditions. The geotechnical investigation and corrective actions for potential liquefiable soils, where needed, would be based on the CGS Special Publication 117A (see Section 4.2.2).

In comparison to aboveground structures, underground pipelines, and buried structures are generally less susceptible to liquefaction damage because they are embedded in compacted backfill that can tolerate more seismic wave motion. While this practice would not completely eliminate the potential for damage to the facilities, it would ensure that the resultant improvements would have the structural fortitude to withstand anticipated groundshaking and seismically induced ground failures without significant damage.

All Other Project Components

The potential for liquefaction is higher in areas composed of granular soils with a shallow depth to groundwater. As shown on Figure 4.2-5, the other project components would not be located in areas susceptible to liquefaction-induced ground settlement.

Impact Conclusion

With implementation of standard engineering practices, compliance with Monterey County requirements for geotechnical study, implementation of the design recommendations from the geotechnical engineer, and standard construction methods, this impact would be less than significant for all components of the proposed project.

Mitigation Measures

None proposed.

Impact 4.2-5: Exposure of people or structures to substantial adverse effects related to landslides or other slope failures. (*Less than Significant*)

Figure 4.2-6 shows the locations of the proposed project components and the potential slope stability hazards associated with seismically-induced landslides. The designation of a given area as having high landslide susceptibility does not necessarily mean that an active landslide is present at that location, only that the steepness of the topography and soil type renders that location more susceptible to landslides. Because steep topography increases landslide risk, the map also shows areas prone to non-seismically induced landslides. Non-seismic slope movement can be caused by the force of gravity on steeper unstable slopes, construction activities that change the existing surface water drainage and create unstable slopes, or the addition of water into the slope material through leaks or breaks in pipelines in steeper landslide prone areas.

Main System-Hidden Hills Interconnection Improvements

The steep hillside terrain on and east of the Monterey Peninsula has an elevated susceptibility to landslides. All but one of the project components would be located in relatively flat to gently-sloping topography and would therefore have a low susceptibility to landslides. Only the Main System-Hidden Hills Interconnection Improvements would be located in an area characterized as having a moderate to high susceptibility to earthquake-induced landslides.

The Main System-Hidden Hills Interconnection Improvements consist of a 100-foot long, 6-inch-diameter pipeline to connect the Hidden Hills section of the system with the main distribution system. The entire pipeline section would be buried from about 4 to 8 feet below the surface in the Tierra Grande Drive road right-of-way, as shown in Chapter 3, Description of the Proposed Project, Figure 3-10b. Upon the completion of construction activities, the surface would be restored to the original existing paved condition. This existing road would continue to be maintained with curbs and gutters to collect and control surface water runoff. Although the Main System-Hidden Hills Interconnection Improvements would be placed in an area with a moderate to high landslide susceptibility, there are no existing active landslides in the area and the project does not include activities that would exacerbate an otherwise unstable slope condition. Furthermore, this area would be evaluated during the project geotechnical evaluation and if potentially unstable slope conditions exist, the geotechnical recommendations that would be developed through that study would be implemented by CalAm to diminish the potential for slope failure. Therefore, the potential impact related to landslide susceptibility is considered less than significant.

All Other Project Components

All other project components would be located in relatively flat to gently-sloping topography and would therefore have a low to no susceptibility to landslides. Therefore, there would be no impact for all other project components.

Impact Conclusion

Impacts associated with landslides would be less than significant for the Main System–Hidden Hills Interconnection Improvement. For all other project components, no impact would occur.

Mitigation Measures

None proposed.

Impact 4.2-6: Exposure of people or structures to substantial adverse effects related to expansive soils. (*Less than Significant*)

Unless properly removed or reconditioned during construction, expansive soils could exert additional pressures on foundations and below-grade facilities, producing shrinkage cracks that allow water infiltration and compromise the integrity of backfill material. Depending on the depth of buried pipelines, soil in expansion or contraction could lead to lateral pipeline stress and stress of structural joints. Lateral stresses could, over time, lead to pipeline rupture or leaks in the coupling joints. Shrinkage cracks could form in native soils adjacent to the pipeline trench or in backfill material if expansive soils are used. If shrinkage cracks extend to sufficient depths, groundwater can infiltrate into the trench, causing piping (progressive erosion of soil particles along flow paths) or settlement failure of the backfill materials. Settlement failure can also occur if expansive soils are used in backfill and undergo continued expansion and contraction. Over time these soils could settle, resulting in misalignment or damage to buried facilities.

The effects of expansive soils could damage foundations of aboveground structures, paved service roads, and concrete slabs. Surface structures with foundations constructed in expansive soils would experience expansion and contraction depending on the season and the amount of surface water infiltration. The expansion and contraction, also referred to as linear extensibility, could exert enough pressure on the structures to result in cracking, settlement, and uplift.

Castroville Pipeline, Carmel Valley Pump Station, Main System–Hidden Hills Interconnection Improvements, and Ryan Ranch–Bishop Interconnection Improvements

Table 4.2-4 lists the properties of all of the soil units on or within which project components would be constructed. Proposed components that would be placed on or in soils with moderate to high expansion or linear extensibility potential include the Castroville Pipeline, Carmel Valley Pump Station, the Main System-Hidden Hills Interconnection Improvements, and the Ryan Ranch–Bishop Interconnection Improvements.

As discussed in Section 4.2.3, Approach to Analysis, the project geotechnical engineer for CalAm has completed a preliminary geotechnical assessment of the pipeline route and project facility sites and would complete a final geotechnical design investigation prior to project construction. The geotechnical evaluation of the project sites includes field sampling and testing of surface soils to determine the presence of expansive soils. The investigation of and treatment for expansive soils is considered standard engineering practice for most development projects. Completion of a geotechnical evaluation and implementation of its recommendations reduces the likelihood that expansive soils could impact project components. In addition, all project elements and pipeline facilities would be designed consistent with AWWA standards for pipelines (discussed in the Approach to Analysis, Section 4.2.3), which account for problematic soils and require remedies for adverse soils in order to adhere to specific standards for pipeline trench excavation, pipe bed material, and backfill. Methods to address expansive soils include removal of the expansive soils or treating the expansive soils by mixing the soil with lime or other additives that reduce the potential for expansion. Given all of these requirements and compliance with standards, the potential for expansive soils to adversely impact project components is low and therefore this impact is less than significant.

All Other Project Components

All other project components would be located in soils with a low linear extensibility potential. Therefore, there would be no impact.

Impact Conclusion

With compliance with applicable construction requirements and design criteria, this impact would be less than significant for the Castroville Pipeline, Carmel Valley Pump Station, Main System–Hidden Hills Interconnection Improvements, and Ryan Ranch–Bishop Interconnection Improvements. There would be no impact for the other project components.

Mitigation Measures

None proposed.

Impact 4.2-7: Exposure of structures to substantial adverse effects related to corrosive soils. (*Less than Significant*)

Soils with a high conductivity can corrode unprotected underground metal pipes and electrical conduits. Over time, pipe corrosion could lead to pipeline failure, resulting in localized surface flooding of water or localized settlement of surface soils at the location of the failure. Failed subsurface electrical conduits could result in electrical short-circuiting. Soils with an acidic pH can corrode unprotected concrete. Over time, concrete corrosion could lead to the degradation of concrete resulting in the cracking and failure of concrete foundations and other support structures. Failed foundations and support structures could result in the breakage of equipment or pipelines and possibly result in temporary shutdown of operations interrupting the public water supply.

MPWSP Desalination Plant, ASR-5 and ASR-6 Wells, ASR Pipelines, and Ryan Ranch–Bishop Interconnection Improvements

Table 4.2-4 lists the properties of all of the soil units within which project components would be constructed. Clayey soils are potentially corrosive. Project components that would be located on or in soils with moderate to high concrete and unprotected steel corrosion potential include the MPWSP Desalination Plant, ASR-5 and ASR-6 Wells, ASR Pipelines, and the Ryan Ranch–Bishop Interconnection Improvements.

As discussed in Section 4.2.3, Approach to Analysis, the project geotechnical engineer for CalAm has completed a preliminary geotechnical assessment of the pipeline route and would complete a final geotechnical design investigation prior to project construction. The geotechnical evaluation of the project area boundaries includes an evaluation for the presence of corrosive soils. Managing corrosive soils is standard engineering practice especially for pipeline projects. If corrosive soils are identified during the final geotechnical design study, the project geotechnical engineer would recommend remedies to eliminate damage from corrosive soils, and those recommendations would be implemented by CalAm. Methods to reduce corrosion of metal and concrete caused by soils include avoidance and removal or the use of cathodic protection. In addition, all project elements and pipeline facilities would be designed consistent with AWWA standards for pipelines (discussed in the Approach to Analysis, Section 4.2.3), which account for problematic soils and require remedies for adverse soils in order to adhere to specific standards for pipeline trench excavation, pipe bed material, and backfill.

All Other Project Components

All other project components would be located in sandy soils with a low corrosivity potential. Therefore, there would be no impact.

Impact Conclusion

The presence of corrosive soils would be evaluated and addressed through the final geotechnical investigation prior to project construction. As previously discussed, the CBC and local permitting regulations require a geotechnical investigation. If the investigation finds corrosive soils, the geotechnical engineer would recommend avoidance, removal, or cathodic protection, and CalAm would be required to implement those recommendations. Therefore, the impact of corrosive soils is considered less than significant for the MPWSP Desalination Plant, ASR-5 and ASR-6 Wells, ASR Pipelines, and the Ryan Ranch–Bishop Interconnection Improvements. There would be no impact for the other project components.

Mitigation Measures

None proposed.

Impact 4.2-8: Exposure of people or structures to substantial adverse effects related to land subsidence. (*No Impact*)

When groundwater is extracted from a confined aquifer, subsidence of the overlying land surface can occur. This type of subsidence is usually associated with severe, long-term withdrawal in excess of recharge that eventually leads to overdraft of the aquifer. As groundwater is pumped out, water is removed from the soil pore spaces leading to a reduction in soil strength. The subsurface conditions more conducive to subsidence include clay or organic-rich soils. Sand- and gravel-rich soils are less prone to subsidence because the larger grains comprise a skeleton less dependent on water pressure for support. The subsidence can result in damage to infrastructure such as buildings or pipelines, or can result in a decrease in the volume of available aquifer storage.

Subsurface Slant Wells

Overdrafting of the Salinas Valley Groundwater Basin has taken place over an extended time, and saltwater has replaced the freshwater in those affected areas, thereby preventing subsidence (Monterey County, 2010). According to the *Monterey County General Plan*, subsidence is not a critical hazard in the county. As described in Section 3.2.1.1 of Chapter 3, Description of the Proposed Project, the subsurface slant wells would be 900 to 1,000 feet long and extend offshore. The slant wells would be screened at depths corresponding to both the Dune Sand Aquifer and the underlying 180-Foot-Equivalent Aquifer of the Salinas Valley Groundwater Basin. These aquifer units are composed predominantly of sand and gravel. Geologic units composed of sands and gravels are less prone to subsidence because the granular structure is better able to support the overlying weight of soil. In addition, because the subsurface slant wells would draw water from the offshore coastal aquifers, seawater would replace the water pumped from the slant wells, as discussed in Section 4.4, Groundwater Resources. The continuous replacement of water would keep the pore spaces between the grains filled with water, further supporting the granular structure. Consequently, the soil structure above the slant wells would be unable to subside as a result of pumping and there would be no impact from subsidence impacts associated with the subsurface slant wells.

ASR-5 and ASR-6 Wells

The screened sections of the proposed ASR-5 and ASR-6 Wells would be located about 1,000 feet bgs in the sandstone portions of the Santa Margarita Formation in the Seaside Groundwater Basin. The sandstone structure of the geologic unit would be expected to support the granular structure during groundwater pumping, especially considering the depth. In addition, the proposed project would typically extract water injected and stored in the ASR system in the same water year. Therefore, the water pumped into the system during the winter and spring would be extracted during the following summer or fall. Furthermore, for the first 25 years of the proposed project, 700 acre-feet annually would be left in the Seaside Groundwater Basin to restore water extracted in years prior to this project. This means that the overall groundwater levels in the Seaside Groundwater Basin would increase as a result of the proposed project. This would result in a decreased potential for surface ground subsidence and there would be no subsidence impacts associated with the ASR-5 and ASR-6 Wells. Also note that the ASR wells are proposed to be located at least 2 miles away from the active, offshores traces of the Chupines Fault Zone, as shown on EIR/EIS Figure 4.2-4. Therefore, the injection of water would not have the potential to activate movement on an active fault.

All Other Project Components

None of the other project components would extract groundwater. Therefore, there would be no impact for all other project components.

Impact Conclusion

Given the existing lack of clay in the aquifer units to be pumped and the management of groundwater levels to reduce or eliminate overdraft, there would be no impacts related to subsidence caused by the ASR injection/extraction wells. Given the continuous recharge of seawater to the slant wells, there would be no impact related to subsidence caused by the slant wells. For all other project components, there would be no impacts.

Mitigation Measures

None proposed.

Impact 4.2-9: Exposure of people or structures to substantial adverse effects related to alternative wastewater disposal systems. (*Less than Significant*)

This impact analyzes alternate wastewater locations relative to the physical suitability of the proposed locations to infiltrate water. The potential impacts relative to water quality are discussed in Section 4.3, Surface Water Hydrology and Water Quality.

Subsurface Slant Wells

After completing the construction of the subsurface slant wells, the wells would be developed to remove sand, silt, and clay from the well and clean out the well screen and sand pack[22] around the well screen. As described in Section 3.2.1.1, subsurface slant wells, the development water would be discharged to pump-to-waste vaults located at the well heads for the percolation of turbid water back into the sand (see **Figure 3-3**) or conveying it to the existing discharge pipeline for the test slant well and discharging it to the ocean via the MRWPCA ocean pipeline and outfall. The pump-to-waste vault would be a precast 12-foot-long, 8-foot-wide, and 1-foot-tall concrete vault covered with a metal grate and underlain by clean gravel and permeable geotextile fabric. The sand, silt and clay would remain in the pit; the water would infiltrate back down to groundwater. If the materials at and beneath were to have low permeability, the water would not be able to infiltrate back into the underlying aquifer.

The area where the water would be placed is composed of Oceano Loamy Sand (see **Table 4.2-4**). However, in the specific area of the slant wells, the materials are dune sands with little to no fine-grained components (silt and clay) or soil components (organic materials) that would impede infiltration. The high permeability of the dune sand would be suitable for the infiltration of water.

ASR-5 and ASR-6 Wells

After completing the construction of the ASR wells, the wells would be developed to remove sand, silt, and clay from the well and clean out the well screen and sand pack around the well

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[22] Sand or gravel packs are sand or gravel installed between the well casing and the surrounding native materials and filters out finer-grained materials from entering the well.

screen. The development water would be discharged to the natural depression shown on **Figure 3-9b**. The sand, silt and clay would remain in the depression; the water would infiltrate back down to groundwater. If the materials at and beneath were to have low permeability, the water would not be able to infiltrate back into the underlying aquifer.

The area where the water would be placed is composed of Baywood Sand (see **Table 4.2-4**). The materials are predominantly sands with little fine-grained components (silt and clay) or soil components (organic materials) that would impede infiltration. The high permeability of the sandy materials would be suitable for the infiltration of water.

All Other Project Components

None of the other project components would require the disposal of wastewater. Therefore, there would be no impact for all other project components.

Impact Conclusion

The alternate wastewater disposal locations for the subsurface slant wells and the ASR wells are sandy areas that would be suitable for the infiltration of water and potential impacts related to the suitability of the locations for wastewater disposal would be less than significant. For all other project components, there would be no impacts. The potential impacts relative to water quality are discussed in Section 4.3, Surface Water Hydrology and Water Quality.

Mitigation Measures

None proposed.

Impact 4.2-10: Accelerate and/or exacerbate natural rates of coastal erosion, scour, or dune retreat, resulting in damage to adjoining properties or a substantial change in the natural coastal environment. (*Less than Significant with Mitigation*)

The sea level in Monterey Bay has been rising for years and is expected to continue rising over the next several decades (ESA, 2013). The Monterey Bay coastline is expected to retreat inland due to the rising sea level and the resulting erosion (ESA, 2014). Erosion and bluff retreat would result in a beach and surf zone that is inland of its current location. The primary concern associated with the proposed project is that coastal retreat could migrate the beach inland such that the subsurface slant well casings, concrete well head vaults, electrical panels, and certain sections of conveyance pipelines would become located on the beach within the project lifetime. As discussed above in the Coastal Retreat Study section, the exposure of the project components to wave action, storm events, and rip embayments could alter the existing natural beach dynamics and the coastal environment, resulting in an increase in beach erosion and/or an interruption in the sand supply to other beaches along the Monterey Bay that would be considered an impact of the proposed project. In addition, beach erosion and bluff retreat caused by the rise in sea level would be a predicted environmental condition that could adversely affect certain components of the project sometime in the future.

The project components that could become located on the beach due to coastal retreat are the subsurface slant wells and associated infrastructure (e.g., well heads, pipelines, and electrical control panels) in the CEMEX active mining area. The area of the slant wells is within the coastal erosion hazard zones that were delineated in the coastal retreat study prepared to evaluate potential coastal erosion hazards associated with the proposed project. The assumptions and methodologies used in the coastal retreat study are discussed above in Section 4.2.3, Approach to Analysis.

Subsurface Slant Wells

The coastal retreat study (ESA, 2014) anticipated that the subsurface slant wells in the CEMEX active mining area could become located on the beach within the project lifetime. It is important to note that predicting the future rate of coastal retreat is an approximation based on anticipated future climate conditions that may vary substantially from actual climate conditions. The coastal retreat study assumes a worst case scenario for planning purposes; the actual amount or rate of coastal retreat could be less.

As described in Sections 3.2.1.1, the seawater intake system would include 10 subsurface slant wells: the existing test slant well, which would be converted to a production well, and the 9 additional new slant wells that would be constructed as part of the proposed project. The subsurface slant wells would originate at an above-ground well head vault behind the beach and radiate out a distance of between 900 and 1,000 feet at an angle of 19 degrees off the horizontal for the existing test slant well and about 14 degrees for all other slant wells off the horizontal toward the Monterey Bay. As shown in **Figure 3-3**, some wells would radiate out in clusters and other wells would be single wells. However, all of the slant wells to be installed would originate from a line about 800 feet back from the shoreline. The wells would extend to the west beneath the sea floor and be screened in the Dune Sand Aquifer and the 180-Foot Equivalent Aquifer.

Figures 4.2-7 and **4.2-8** are coastal profiles developed from the coastal retreat study that show the predicted cross-sectional profile of the coastal bluffs at the CEMEX mining facility through 2060. The methodology and assumptions applied to developing these erosion profiles are discussed above in Section 4.2.3, Approach to Analysis, and in the coastal retreat study (see **Appendices C1 and C2**). The cross-sectional profiles in **Figures 4.2-7** and **4.2-8** show a projected future profile (solid line) and an extremely eroded profile or “lower profile envelope” (dashed line) for the time horizons of 2010, 2040, and 2060. These modeled erosion profile envelopes account for long-term erosion and sea level rise, additional seasonal scour from rip embayments that would predominantly occur in winter, and the additional erosion that would occur from a 100-year storm event.

As originally proposed by CalAm, some slant well clusters were considered in preliminary locations that the coastal retreat study conservatively indicated could either be undermined or exposed, or undergo damage during a large storm event. Consequently, the final design locations for these wells were relocated approximately 400 feet further inland from the originally proposed locations to the locations shown on **Figures 4.2-7**, **4.2-8**, and **3-3**.

Based on the profile, the proposed slant wells would now be located behind the predicted 2060, 100-year lower profile envelope. The coastal retreat study determined that under a conservative predicted erosion rate and considering the additional scour caused by a 100-year storm event in that time horizon, the proposed slant wells would remain buried in the dunes and would not become exposed on the beach until sometime after 2060. The rate of bluff retreat used in the coastal retreat study is conservative in that it may not account for natural accretion of sand on the beach and bluffs that could occur during years of below normal storm activity. As a result, it is possible that the 2060 bluff retreat envelope shown on the profile may not be realized until years after 2060. According to the evaluation criteria for coastal erosion (see Section 4.2.4, Evaluation Criteria, above), the proposed project would cause a significant impact if it accelerated and/or exacerbated natural rates of coastal erosion, scour, or dune retreat resulting in a substantial adverse change in the coastal environment. The proposed slant wells would not be exposed during the useful life of the slant production wells (anticipated to be 20 to 25 years) and would not contribute to further coastal erosion or changes in the beach environment. Therefore, the proposed location of the proposed slant wells would not represent a potential erosion hazard and would not contribute to a significant impact of the proposed project.

Based on the profile, the well head and insertion point for the existing test slant well is about 300 feet closer to the ocean than the nine proposed subsurface slant wells. The test slant well is anticipated to be within the 2060 future 100-year storm coastal erosion profile and lower profile envelope. As noted above, the modeled coastal retreat rate is conservative and the actual rate of coastal retreat may be less.

The coastal erosion modeling anticipates that the beach could migrate inland to the location of the test slant well by the year 2060. Assuming the pilot program being conducted for the test slant well confirms the CEMEX active mining area to be a viable location for the Seawater Intake System, the test slant well would be converted into a permanent well and incorporated into the seawater intake system with a well head vault. Given the test slant well's forward location on the beach at the estimated 2060 future 100-year storm coastal erosion profile and lower profile envelope, it is possible that the well casings and concrete wellhead vault might become exposed on the beach sometime during the operational life of the project. If exposed, the subsurface slant well could contribute to accelerated and/or exacerbated natural rates of coastal erosion, scour, and dune retreat that could alter the natural coastal environment. In addition, exposure of these structures could adversely affect scenic resources and recreational uses on the beach.

All Other Proposed Facilities

None of the other project components are close enough to the coast to be vulnerable to coastal retreat. Therefore, there would be no impact on coastal erosion. But the brine generated by the desalination plant could scour the seafloor as it is released from the existing outfall diffuser. A comparison of the jet plume velocity with oceanic current measurements and estimates based on ocean circulation models at Monterey Bay, indicate that the currents produced by the jet plumes are on the same order of magnitude and similar to the ambient ocean currents for average values and considerably smaller when compared to the maximum currents estimated and observed in Monterey Bay and at the outfall location. **Table 4.2-8** summarizes the ambient ocean currents at

Monterey Bay at a 30m depth and the estimated current velocities of the jet plume at the moment it touches the sea floor for the worst case scenario discussed Section 4.3, Surface Water Hydrology and Water Quality. This impact would be less than significant.

TABLE 4.2-8
COMPARISON OF JET PLUME AND AMBIENT OCEAN CURRENTS AT MONTEREY

	Mean (ft/s)	Maximum (ft/s)
Ocean Currents – ROMS[a]	0.13	0.76
Ocean Currents – ADCP[b]	0.16	
Wave Induced Currents[c]	0.3	1.87
Jet Plume Centerline[d]		0.4
Jet Plume - 3 ft from centerline[e]		0.02

NOTES:
a Ocean currents from ROMS model from January 2011 to March 2012 at the outfall location 30 m depth
b ADCP measurements of Tenera (2014) at a depth of 30 m near the mouth of Monterey Cannon
c Wave induced currents at 30 m depth based on 5 years of wave measurements from January 2007 to December 2012 (NDBC, 2013, ID buoy 46236).
d Visual plume results for scenario P2 at the centerline.
e From Phillip Roberts Appendix D1. The entrained velocity of the jet plume decreases rapidly with distance from the jets in inverse proportion to the distance r. So at a distance of 3 ft from the jet centerline, the velocity will fall to about 0.02 ft/s

Consistency with Plans & Policies

In addition to the physical impacts described above, as noted in **Table 4.2-6**, the MPWSP could conflict with applicable land use plans, policies, or ordinances related to coastal erosion that were adopted for the purpose of avoiding or mitigating an environmental effect. Specifically, coastal-erosion-induced exposure of the subsurface slant wells would conflict with California Coastal Act Sections 30235 and 30253; Marina General Plan Policy 4.102.4; Marina Local Coastal Land Use Plan Geotechnical Guidelines; Monterey Harbor Land Use Plan Policies 3.b, 3.c, and 3.d; Del Monte Beach Land Use Plan Policies 3.1, 3.3, 3.4, 3.7, and 3.11; and Monterey County General Plan Policy S-1.6. As discussed in the subsequent paragraphs, **Mitigation Measure 4.2-10 (Slant Well Abandonment Plan)** would require abandonment of the subsurface slant wells before coastal retreat migrates the beach inland to the location of the subsurface slant wells. With these measures implemented, the MPWSP would be brought into conformance with the above-noted policies.

Impact Conclusion

The anticipated future presence of the test slant well on the beach due to coastal retreat would result in a significant impact. **Mitigation Measure 4.2-10 (Slant Well Abandonment Plan)** would reduce the impact to a less-than-significant level by requiring CalAm to monitor coastal retreat rates and initiate well decommissioning before the beach migrates inland to the location of the subsurface slant wells. As previously discussed, the proposed new slant wells would be located inland of the modeled anticipated inland extent of coastal retreat. However, the rate of coastal retreat may vary due to unforeseen changes in climate change. Therefore, this mitigation measure shall also apply to all of the slant wells.

Mitigation Measures

Mitigation Measure 4.2-10 applies to all slant wells.

Mitigation Measure 4.2-10: Slant Well Abandonment Plan.

CalAm shall monitor and report the rate of coastal retreat and implement the following corrective measure:

1. CalAm shall conduct annual monitoring of the rate of coastal retreat relative to the slant wells at the CEMEX site by measuring the distance from the wellhead to the western dune face. The data shall be reported no later than June 30 each year to the agency issuing the Coastal Development Permit and shall establish an annual erosion rate to be used to estimate the year at which the wells and associated pipelines have 5 years before exposure, assuming that at least one 100-year storm event will have occurred within that exposure timeframe.

2. Beginning at least 5 years prior to the anticipated exposure of the slant wells, CalAm shall implement the planning and permitting necessary to abandon the slant wells in accordance with state well destruction standards. An application to destroy the slant well would be submitted to the Monterey County Environmental Health Bureau, Drinking Water Protection Services Unit, for approval. The abandonment plans shall be prepared in coordination with the property owner.

3. Once an estimated exposure window is established through annual monitoring and a removal date is identified, CalAm shall remove the slant wells from service prior to their exposure. Slant well abandonment activities would be restricted to the snowy plover non-nesting season (October 1 through February 28) to avoid impacts on nesting plovers and other sensitive species. The wellhead vault, electrical panel, buried electrical conduit, and discharge piping would all be excavated and removed, followed by backfilling and compaction of the excavated vault location and trenches. The well abandonment shall be conducted in coordination with the property owner.

4. The slant well casing shall be pressure grouted such that the screened section is sealed, pursuant to the requirements of State of California Well Standards Bulletin 74-81 and 74-90, Part III Section 23. The section of well casing and pipelines at risk of exposure shall be cut and removed to a depth of five feet below the 2060, 100-year lower profile envelope as determined by the 2014 Coastal Erosion Study (ESA, 2014) or as directed by any permit condition.

Secondary Impacts of Mitigation Measure 4.2-10

Slant well abandonment would take approximately 4 weeks and all abandonment activities would occur within the original construction footprint. Re-grading of the CEMEX access road would be necessary at the conclusion of abandonment activities, consistent with property owner requirements.

Potential secondary impacts associated with implementation of **Mitigation Measure 4.2-10 (Slant Well Abandonment Plan)** would be similar to the impacts associated with construction activities such as mobilization, site clearance, grading, excavation, and other earthmoving activities in the original construction footprint. However, slant well abandonment would not involve drilling or excavation but would involve cutting and removing the well casing.

Slant well abandonment could result in secondary impacts on water quality, including:

- Increased soil erosion and the potential for a hazardous chemical release. See Impact 4.3-1, in Section 4.3.5.1. Mandatory compliance with the NPDES Construction General Permit requirements would require the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which would prevent significant construction-related impacts on water quality. The Plan would be required to identify standard Best Management Practices to be implemented to control erosion and reduce sedimentation. Site monitoring by the applicant's erosion-control specialist would be undertaken and a follow-up report would be prepared that documents the progress and/or completion of required erosion-control measures both during and after slant well abandonment activities. No synthetic plastic mesh products could be used in any erosion control materials. All plans would be required to show that sedimentation and erosion control measures are installed prior to any other ground disturbing work.

Slant well abandonment could result in potentially significant but mitigable secondary impacts on terrestrial biological resources, including:

- Special-Status Species. See Impact 4.6-1 in Section 4.6.5.1. Implementation of Mitigation Measures 4.6-1a through 4.6-1g, 4.6-1i, 4.6-1n, 4.6-1p, 4.12-1b, and 4.14-2 would reduce impacts to a less-than-significant level.
- Sensitive natural communities and critical habitat. See Impact 4.6-2 in Section 4.6.5.1. Implementation of Mitigation Measures 4.6-1a through 4.6-1d, 4.6-1n, 4.6-1p, 4.6-2a, and 4.6-2b would reduce impacts to a less-than-significant level.
- Introduction or spread of invasive non-native species. See Impact 4.6-5 in Section 4.6.5.1. Implementation of Mitigation Measures 4.6-1a and 4.6-1p would reduce impacts to a less-than-significant level.

Slant well abandonment could result in potentially significant but mitigable secondary impacts related to hazards and hazardous materials, including:

- The potential to encounter contaminated soil/and or groundwater. See Impact 4.7-2 in Section 4.7.5.1. Implementation of Mitigation Measures 4.7-2a and 4.7-2b would reduce the impacts to a less-than-significant level.

Slant well abandonment could result in potentially significant but mitigable secondary impacts on air quality, including:

- The potential to violate ambient air quality standards associated with ozone, NO_2, and, PM_{10}. See Table 4.10-5, Estimated Maximum Daily Construction Emissions, which includes the estimated emissions for construction of the slant wells. Slant well abandonment would produce a fraction of the emissions associated with the slant well construction period since abandonment would take 4 weeks rather than 15 or more months, and because there would be no drilling; construction emissions would only occur as a result of grading, excavation, and earth moving activities. Since slant well abandonment is projected to occur decades after the completion of construction, it would not contribute to total maximum daily project construction emissions, and impacts would be less than significant with mitigation for PM_{10}. Mitigation Measures 4.10-1a through 4.10-1c would apply to slant well abandonment.

Slant well abandonment could result in potentially significant but mitigable secondary impacts on greenhouse gas (GHG) emissions, including:

- The potential to incrementally contribute to climate change from GHG emissions. See Table 4.11-3, Total GHG Emissions from Project Construction, which includes the estimated emissions for construction of the slant wells. Slant well abandonment would produce a fraction of the emissions associated with the slant well construction period since abandonment would take 4 weeks rather than 15 or more months, and because there would be no drilling; construction emissions would only occur as a result of grading, excavation, and earth moving activities. Although slant well abandonment would contribute to overall project (lifetime) emissions, when amortized over the 40-year period described in Impact 4.11-1, these emissions would add only marginally to total annual amortized emissions shown in Table 4.11-5. Impacts would be less than significant with implementation of Mitigation Measure 4.18-1, which would apply to slant well abandonment.

Slant well abandonment could result in potentially significant but mitigable secondary impacts on aesthetic resources, including:

- Nighttime lighting. See Impact 4.14-2 in Section 4.14.6.1. Slant well abandonment could adversely affect nighttime views of this mostly undeveloped stretch of coastline from the viewpoint of Highway 1 motorists and coastal Marina residents. If slant well abandonment involves nighttime lighting, implementation of Mitigation Measure 4.14-2 would reduce impacts to a less-than-significant level.

4.2.6 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects.

Impact 4.2-C: Cumulative impacts related to geology, soils, and seismicity. (*Less than Significant with Mitigation*)

Although the Monterey Bay area is located within a seismically active region with a wide range of geologic and soil conditions, these conditions can vary greatly within a short distance. Accordingly, geologic, soils, and seismic impacts tend to be site-specific and depend on the local geology and soil conditions. For these reasons, the geographic scope for potential cumulative geologic and seismic impacts consists of the project component locations and the immediate vicinity. The timeframe during which the MPWSP could contribute to cumulative geology, soils, and seismicity effects includes the construction and operations phases.

Cumulative Impacts during Project Construction

As described in Impact 4.2-1, construction activities have the potential to cause soil erosion and loss of topsoil. Two of the MPWSP's water conveyance pipelines (Castroville and New Desalinated Water Pipelines) and TAMC's Monterey Peninsula Light Rail Project (No. 38 in Table 4.1-2 in Section 4.1) would be constructed adjacent to each other and within the same alignment. The alignments may cross each other at the northern end of the Castroville Pipeline. The Marina Station project (No. 12) would be constructed on either side of Del Monte Boulevard where the new Desalinated Water Pipeline would be constructed. The new Transmission Main would cross through the southwest portion of the area that may be redeveloped as part of the Main Gate Specific Plan (No. 18).

If the projects are constructed at the same time, the erosion effects could be cumulatively significant. However, the state Construction General Permit would require each project to prepare and implement a SWPPP. The SWPPPs would describe BMPs to control runoff and prevent erosion for each project. Through compliance with this requirement, the potential for erosion impacts would be reduced. The Construction General Permit has been developed to address cumulative conditions arising from construction throughout the state, and is intended to maintain cumulative effects of projects subject to this requirement below levels that would be considered significant. For example, two adjacent construction sites would be required to implement BMPs to reduce and control the release of sediment and/or other pollutants in any runoff leaving their respective sites. The runoff water from both sites would be required to achieve the same action levels, measured as a maximum amount of sediment or pollutant allowed per unit volume of runoff water. Thus, even if the runoff waters were to combine after leaving the sites, the sediments and/or pollutants in the combined runoff would still be at concentrations (amount of sediment or pollutants per volume of runoff water) below action levels and would be cumulatively less than significant. Similarly, the impacts of the MPWSP water conveyance pipelines combined with TAMC's Monterey Peninsula Light Rail Project, the Marina Station, the Main Gate Specific Plan, and/or Sanitary Sewer System Rehabilitation Program would not cause a significant cumulative impact related to soil erosion (Impact 4.2-1) and the proposed project's contribution to cumulative impacts on soil erosion would be less than significant.

Two of the MPWSP's water conveyance pipelines (Castroville and New Desalinated Water Pipelines) and TAMC's Monterey Peninsula Light Rail Project (No. 38) would be constructed adjacent to each other and within the same alignment adjacent to active farmland and potentially in areas of sensitive natural communities dependent on the topsoil. If the projects are constructed at the same time, the loss of topsoil impacts could be cumulatively significant, and the proposed project would have a significant contribution to this significant cumulative loss of topsoil. The proposed project's contribution to this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts on Sensitive Communities Environmentally Sensitive Habitat Areas)** and **Measure 4.16-1 (Minimize Disturbance on Farmland**) because these measures require that topsoil be salvaged, stockpiled separately from subsoils, and returned to its appropriate location in the soil profile during backfilling activities. Thus, after mitigation, topsoil would be replaced and there would be no substantial residual contribution to a cumulative impact. It is unknown whether the TAMC's Monterey Peninsula Light Rail Project would implement similar mitigation measures, although it is likely that existing regulations would require mitigation measures for sensitive natural communities. In any case, with implementation of the mitigation measures for the proposed project, the proposed project's contribution to a significant cumulative impact would be reduced to a level that is less than significant.

Cumulative Impacts during Project Operations

With the exception of the existing Slant Test Well project (No. 47), which is assumed to become a component of the proposed project, and TAMC's Monterey Peninsula Light Rail Project (No. 38), none of the other projects listed in **Table 4.1-2** would have a footprint that overlaps with that of a proposed project component. The Test Slant Well and TAMC's Monterey Peninsula Light Rail Project are not located on known active faults. The Test Slant Well is not located on expansive soils. Because of the localized nature of the anticipated project impacts, the other projects listed in **Table 4.1-2** would not combine with those of the proposed project to cause or contribute to potential cumulative geologic, soil, or seismic impacts associated with fault rupture (Impact 4.2-2) or expansive soils (Impact 4.2-6) (*no impact*).

As described in Impacts 4.2-3, 4.2-4, and 4.2-7, seismically induced groundshaking, liquefaction and lateral spreading, and corrosive soils could cause pipeline leaks or ruptures. State and local building regulations and standards, described in Section 4.2.2, Regulatory Framework, have been established to address and reduce the potential for such impacts to occur. The proposed project and cumulative projects identified in **Table 4.1-2** would be required to comply with applicable provisions of these laws and regulations. Through compliance with these requirements, the potential for impacts such as pipeline leaks or ruptures would be reduced. As explained in Section 4.2.2, the purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction; by design, it is intended to reduce the cumulative risks from buildings and structures. Therefore, based on compliance with these requirements, the incremental impacts of the proposed project combined with impacts of other projects in the area would not cause a significant cumulative impact related to seismically induced groundshaking (Impact 4.2-3), liquefaction and lateral spreading (Impact 4.2-4), or corrosive soils (Impact 4.2-7) and the proposed project's contribution to cumulative effects would be less than significant.

As discussed in Impact 4.2-5, the Main System-Hidden Hills Interconnection Improvements are proposed for an area with high to moderate landslide susceptibility. As indicated on **Figure 4-1**, there are no cumulative projects in the vicinity of the Main System-Hidden Hills Interconnections Improvements site. Moreover, as discussed in Impact 4.2-5, upon completion of construction activities, the pipeline would be buried below the street, the surface would be restored to the approximate pre-construction paved condition (e.g., slope and drainage), and the risk of the proposed project initiating ground movement would be the same as pre-construction conditions. As a result, the proposed project would not cause or contribute to any potential cumulative effect related to landslide (Impact 4.2-5) (*no impact*).

As discussed in Impact 4.2-8, the proposed project would have no impact related to subsidence caused by the ASR injection/extraction wells or the subsurface slant wells. Because the Slant Test Well would become permanent and operated as part of the MPWSP seawater intake system during proposed project operations, its operational extraction of water is considered as part of the impact analysis for the proposed project and is not an additional extraction within the cumulative scenario. Therefore, the proposed project would not cause or contribute to a cumulative subsidence impact (*no impact*).

As discussed in Impact 4.2-9, the proposed project would have no impact related to exposing people or structures to substantial adverse effects related to alternative wastewater disposal systems. Therefore, the use of alternate wastewater disposal would not cause or contribute to a cumulative alternate wastewater disposal impact (*no impact*).

As discussed in Impact 4.2-10, coastal retreat due to sea level rise is anticipated to result in coastal erosion and bluff retreat. Over time, coastal retreat is anticipated to migrate beaches inland, and structures located within the areas of coastal retreat could become located on beaches. The presence of structures on beaches could exacerbate shoreline erosion and scour and/or be subject to damage or failure associated with severe storm events. Several cumulative projects are located at the coast, particularly the sandy beach areas of Monterey Bay: Fort Ord Dunes State Park Campground (No. 46), Monterey Bay Shores Resort (No. 19), The Collection at Monterey Bay Resort (No. 56), City of Seaside 90-inch Bay Avenue Outfall Phase 1 (No. 43), and City of Sand City Coastal Desalination Plant (No. 6). The exposure of structures on the beach from one or more of these sites could result in increased scour and erosion that could be cumulatively significant. Because over the project lifetime, the subsurface slant well casings, concrete well head vaults, electrical panels, and certain sections of conveyance pipelines could become located on the beach and therefore could exacerbate shoreline erosion and scour, the proposed project would have a significant contribution to this significant cumulative impact. The proposed project's contribution would be reduced to a less-than-significant level through implementation of **Mitigation Measure 4.2-10 (Slant Well Abandonment Plan)**, which would require CalAm to monitor coastal retreat rates and initiate well decommissioning before the subsurface slant wells become located on the active beach. Thus, after mitigation, no project structures would become located on the active beach, and the residual contribution to a cumulative impact related to coastal erosion would be negligible. One project, the CEMEX Removal Plan and Reclamation Plan (No. 63), would end sand mining at the CEMEX site, remove structures from the beach, and implement reclamation practices that may slow coastal retreat at this location compared to rates of retreat with sand mining, though to an unknown extent. It is unknown whether the other listed cumulative projects also have plans to remove structures from the beach prior to exposure or install protective structures in the event that coastal retreat reaches their structures. In any case, with implementation of the mitigation measure, the proposed project's contribution to a significant cumulative impact related to coastal erosion would be reduced to a level that is less than significant.

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4.3 Surface Water Hydrology and Water Quality

Sections

Figures

Tables

This section analyzes the potential for the Monterey Peninsula Water Supply Project (MPWSP or proposed project) which includes 10 slant wells at CEMEX, to adversely affect surface water hydrology and water quality in inland freshwater bodies and in Monterey Bay National Marine Sanctuary (MBNMS) ocean waters[1] in the southern portion of Monterey Bay. Impacts on groundwater resources are evaluated in Section 4.4, Groundwater Resources. The secondary effects of potential project-related changes in ocean water quality on marine biological resources are evaluated in Section 4.5, Marine Biological Resources. Impacts related to coastal erosion are evaluated in Section 4.2, Geology, Soils, and Seismicity.

Comments received on the April 2015 Draft EIR expressed concerns over the potential for hypoxia[2] to occur near the seabed as a result of proposed MPWSP operational discharges. Specifically, there was concern that high salinity discharges from the MRWPCA outfall would restrict oxygen supply near the seabed and result in stress or mortality to benthic organisms and other marine resources. Additionally, comments raised concerns regarding the adequacy of model analyses related to salinity and water quality; the travel path of the operational discharge plume; salinity levels within and beyond the area of initial dilution following discharge; and the potential for a dense operational discharge plume to travel along the sea floor and result in impacts on marine resources as a result of elevated salinity and associated toxic effects to habitat and wildlife. These issues are addressed in Section 4.3.5.2 under Impact 4.3-4 and Impact 4.3-5. Comments related to impacts on marine biological resources resulting from operational discharges are addressed in Section 4.5, Marine Biological Resources and are based, in part, on the water quality analyses presented in Impacts 4.3-4 and 4.3-5. Additional sampling and modeling were conducted to address many of these concerns and are addressed in Section 4.3.5.2.

As a result of comments received on the January 2017 Draft EIR/EIS, revisions have been made to this EIR/EIS section. Those changes include:

- *Clarifications and revisions to Setting/Affected Environment and Regulatory Setting sections.*
- *Additional dilution model analysis to assess dilution and water quality impacts for a wider range of potential operational discharge scenarios.*
- *Incorporation of additional water quality data into the assessment of potential water quality impacts from operational discharges.*
- *Revisions relating to compliance with Ocean Plan water quality objectives for two constituents for certain operational discharge scenarios based on revised model analysis and additional water quality data.*
- *Removal of biologically active filtration from Mitigation Measure 4.3-5.*
- *Addition of end gate modification for the existing diffuser outfall structure in Mitigation Measure 4.3-5.*

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1 "Ocean water" is defined as water located above the seafloor.

2 Hypoxia, or oxygen depletion, is an environmental phenomenon where the concentration of dissolved oxygen in the water column decreases to a level that can no longer support living aquatic organisms. The impacts of hypoxia are often described as creating a so-called "dead zone" in the marine environment.

- *Addition of an assessment of the efficacy of end gate modification to increase dilution for operational discharges.*
- *Addition of an assessment of secondary impacts from implementing end gate modification under Mitigation Measure 4.3-5.*
- *Additional model assessment to determine the feasibility of retrofitting the existing outfall diffuser with incline jets to achieve compliance with all Ocean Plan water quality objectives.*
- *Revision of Mitigation Measure 4.3-5 such that retrofit of the diffuser is elevated to the primary mitigation strategy for mitigating water quality impacts based on model assessment.*

4.3.1 Setting/Affected Environment

The study area for evaluation of surface water hydrology and water quality impacts is the Salinas River watershed, Carmel River watershed, and the southern portion of Monterey Bay south of Elkhorn Slough within MBNMS.

4.3.1.1 Climate and Topography

The climate in the study area is moderate throughout the year with warm, dry summers and cool, moist winters. The average temperature is approximately 60 degrees Fahrenheit (°F) (Monterey County, 2008). Rainfall occurs primarily between November and April. Average annual rainfall in the county is approximately 18 inches.

The study area lies within the southern portion of the Coast Ranges province. The topography in the study area is dominated by a rugged coastline and the Diablo, Gabilan, and Santa Lucia mountain ranges with peaks of up to 5,844 feet above mean sea level (msl). Elevations in the project area range from approximately 10 feet above msl in the CEMEX active mining area to roughly 300 feet above msl along General Jim Moore Boulevard in Seaside. The topography of the project area results in part from the gently to moderately rolling sand dunes that are present along the coastal areas in the north to the city of Monterey in the south. Active, wind-blown dunes generally extend less than a 0.5-mile inland, and older, more stabilized dunes extend up to 4 miles inland.

4.3.1.2 Regional Surface Water Hydrology

The project area is located in the Salinas River and Carmel River watersheds (see **Figure 4.3-1**), which are discussed below. The headwaters of the Salinas and Carmel Rivers, the primary watercourses in the region, originate in the Santa Lucia and Gabilan Mountains (Monterey County, 2008). In general, the overall drainage pattern in the county is from southeast to northwest. The Salinas River drains into Monterey Bay and the Carmel River drains into Carmel Bay both of which are within MBNMS. A third major watershed in the region, the Pajaro River watershed, lies north of the project area and includes the Elkhorn Slough subwatershed. The Pajaro River enters Monterey Bay at the northern tip of Monterey County. The Pajaro River Watershed lies north of and outside of the project area and is not discussed further.

Salinas River Watershed

With the exception of the Main System-Hidden Hills Interconnection Improvements and the Carmel Valley Pump Station, all of the proposed project facilities would be located in the Salinas River watershed. The Salinas River drains approximately 3,950 square miles and has the largest drainage area in Monterey County. The Salinas River watershed is bounded by the Santa Lucia Mountains to the west and the Gabilan Mountains to the east (Monterey County, 2008). Historically, the Salinas River joined with Elkhorn Slough in Moss Landing prior to discharging into Monterey Bay; this river segment is now referred to as the Old Salinas River. Today, the Salinas River drains directly into Monterey Bay approximately 4 miles south of Moss Landing (CCoWS, 2006). In the project area, within the Salinas River watershed, the Canyon del Rey subwatershed extends east of Monterey and Seaside (see **Figure 4.3-1**). The Canyon del Rey subwatershed covers approximately 13.8 square miles and is located along the Seaside/Del Rey Oaks/Highway 68 corridor (Monterey County, 2010b). Canyon Del Rey Creek discharges seasonally to Monterey Bay via Laguna del Rey.

Average annual flows to the ocean from the Salinas River are around 282,000 acre-feet per year, most of which occurs from November through March. This period corresponds to the months of peak seasonal rainfall and coincides with a seasonal drop in irrigation in the valley (Monterey County, 2008). The Salinas River hydrology during the dry season is largely determined by water releases from the Nacimiento and San Antonio reservoirs. During spring and summer, operation of the two reservoirs regulates flow to minimize ocean outflow and maximize groundwater recharge through the Salinas River bed (Kozlowski et al., 2004). Water from the reservoirs[3] is used for groundwater recharge and managed so that the flows reach the lower Salinas River and percolate without being lost to the ocean (Kozlowski et al., 2004).

Carmel River Watershed

The Carmel River watershed covers an area of 255 square miles. From its headwaters in the Santa Lucia Mountains, the Carmel River flows for 36 miles, draining into Carmel Bay just south of the city of Carmel-by-the-Sea (Monterey County, 2010b). The larger tributaries of the Carmel River include Garzas Creek, San Clemente Creek, Tularcitos Creek, Pine Creek, Danish Creek, Cachagua Creek, and Miller Fork. The Main System-Hidden Hills Interconnection Improvements and the Carmel Valley Pump Station would lie within the Carmel River watershed.

Monterey Bay

Monterey Bay is a bay of the Pacific Ocean on California’s Central Coast within MBNMS. The bay extends between the city of Santa Cruz and the Monterey Peninsula. MBNMS was designated in 1992 as a federally protected marine area off of California's Central Coast. It stretches from Marin to Cambria, encompasses a shoreline length of 276 miles and 4,601 square nautical miles of ocean, and extends an average distance of 30 miles from shore. The shoreline of Monterey Bay is composed primarily of less resistant sand dune and sedimentary deposits that form the ancient sand dune terraces and provide the opportunity for farmland around the communities of Watsonville,

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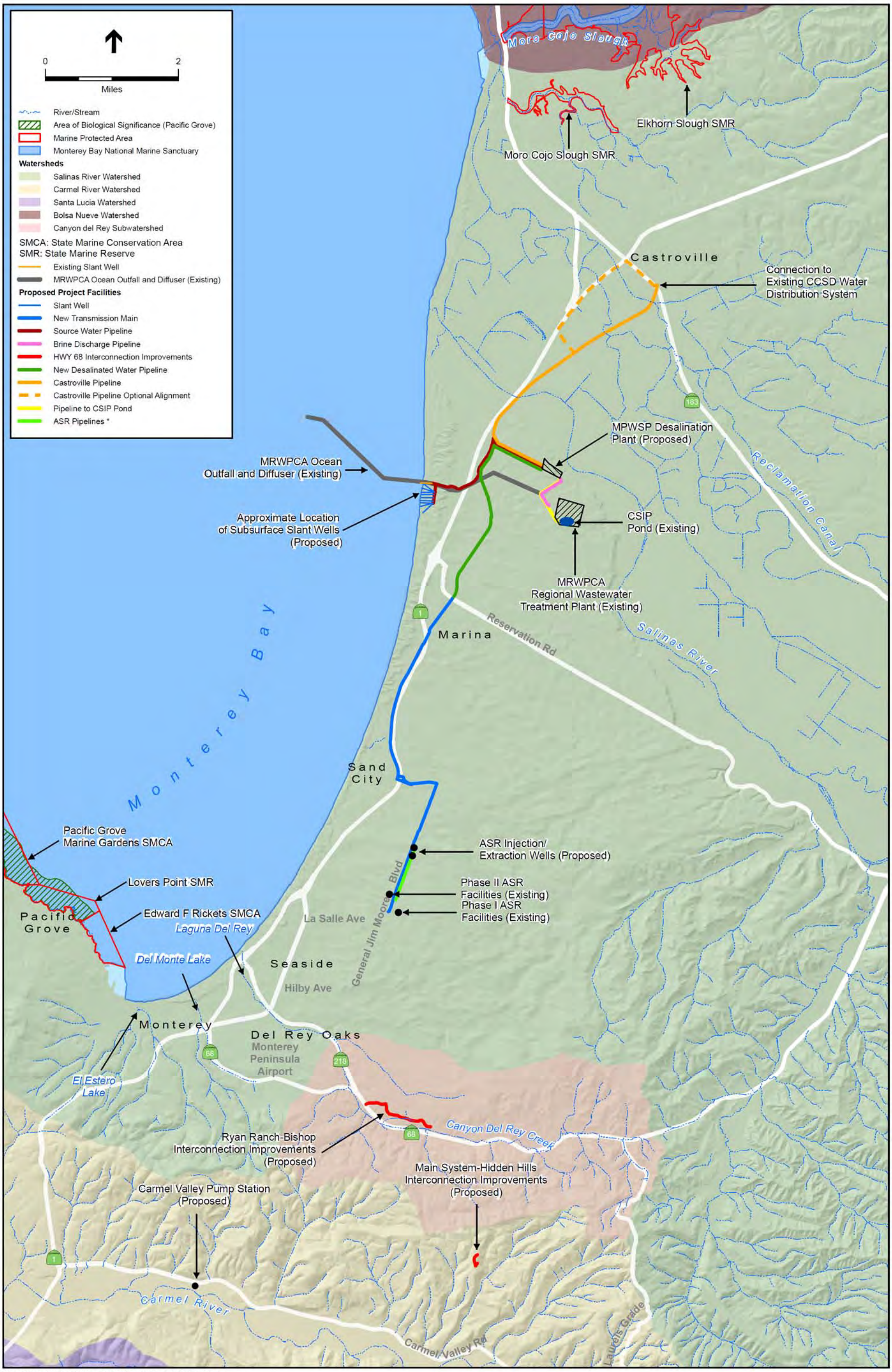
[3] This does not include the modifications to the Nacimiento Dam spillway and operation of the rubber dam associated with the Salinas Valley Water Project.



SOURCE: DWR, 2004; SWRCB, 2005; NOAA, 2012

NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

205335.01 Monterey Peninsula Water Supply Project

Figure 4.3-1
Surface Water Resources in the Project Area

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Castroville, Marina, Sand City, and Seaside. The primary freshwater inputs to Monterey Bay are through the San Lorenzo, Pajaro, Salinas and Carmel Rivers but other water bodies such as the Moro Cojo Slough feed into the Monterey Bay (see **Figure 4.3-1**). Beneath Monterey Bay is the Monterey Submarine Canyon, one of the deepest submarine canyons on the west coast of the United States (MBARI, 2016). The canyon head lies just offshore of Moss Landing. From there, the main channel meanders 470 kilometers (292 miles) seaward and is approximately 12 kilometers at its widest point, with a maximum rim to floor relief of 1,700 meters (5,577 feet) (MBNMS, 2016a). The Monterey Canyon system includes two additional canyon heads, Soquel Canyon and Carmel Canyon, which flank Monterey Canyon to the north and south, respectively.

The oceanographic features primarily affecting waters of Monterey Bay are seasonal upwelling and the California Current System, which consists of the California Current, the California Undercurrent, and the Davidson Current. The California Current is a large scale upper ocean current that transports cold, subarctic water with lower salinity from the North Pacific south along the North American coast where it mixes with warm, saltier equatorial water (ESA, 2015). Beneath this near-surface current and relatively close inshore (within 100 kilometers or 62 miles), is the California Undercurrent that transports warm subtropical water northward. During winter months the California Undercurrent becomes the inshore countercurrent or Davidson current (Flow Science Inc., 2014). Seasonal upwelling and the California Current System and its influence on Monterey Bay water quality is discussed further in Section 4.3.1.3 (below).

4.3.1.3 Surface Water Quality

The quality of surface water is primarily a function of land uses in the project area. Pollutants and sediments are transported in watersheds by stormwater runoff that reaches streams, rivers, storm drains, and reservoirs. Local land uses influence the quality of the surface water through point source discharges (i.e., discrete discharge from a wastewater treatment plant) and nonpoint source discharges (e.g., storm runoff). Some of the most prominent water quality problems in the project area are erosion and sedimentation, pollutants in urban runoff, nitrate contamination, and inorganic constituents (Monterey County, 2010b). Surface water quality for the two primary watersheds in the project area and Monterey Bay is described below.

Salinas River and Carmel River Watersheds

Urban runoff has the potential to directly affect water quality in the Salinas River and in Monterey Bay (Monterey County, 2008). As further discussed in Section 4.3.2.1, below, the lower Salinas River water quality is impaired by pesticides and nutrients. Relatively less urbanization has occurred in the Carmel River watershed as compared to the Salinas River watershed. However, because most of the urban uses are close to the Carmel River, they present the potential for direct impacts on surface water quality. According to a Carmel River Watershed Conservancy[4] monitoring report (2004), excess sediment in the Carmel River occurs due to various land uses and road designs.

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[4] The Carmel River Watershed Conservancy monitors the health of the Carmel River watershed resources including creeks, streams, and wildlife habitat.

Monterey Bay

This section characterizes baseline water quality conditions in Monterey Bay/MBNMS with a focus on salinity and temperature (which can affect ocean water density and receiving water mixing dynamics) as well as water quality constituents that are regulated by the State Water Resources Control Board (SWRCB) and the Central Coast Regional Water Quality Control Board (RWQCB) (see Section 4.3.2, Regulatory Framework, below, for additional information regarding water quality regulations). Ocean climate, a physical driver that affects water quality in Monterey Bay, is also described here. When turbulence associated with ocean currents or surface waves exceed the threshold required for initiating motion of seabed materials, the resuspension of bottom sediments, which occurs naturally, can affect water quality by producing short-term and localized increases in suspended sediment concentrations and turbidity levels in near bottom waters. Suspended sediments also occur in surface waters following storm events that result in discharges from coastal rivers. Ocean currents may transport these river-derived sediments substantial distances alongshore or offshore from the origin. For additional details related to sediment dynamics and physical processes in Monterey Bay, see Section 4.5, Marine Biological Resources.

Salinity and Temperature

The seawater in Monterey Bay is a mixture of water masses from different parts of the Pacific Ocean with warmer, saltier water from the equatorial zone and colder, fresher water from the arctic regions. Near-shore surface temperatures vary from 46.4°F (8°C) during winter and early spring to 62.6°F (17°C) during fall. Near-shore surface salinities vary from 33.2 practical salinity units (psu) to 34.0 psu[5] when upwelling[6] is strong. Streams and rivers can locally affect salinity, but even during flood conditions, when freshwater inputs to Monterey Bay peak, the salinity of Monterey Bay surface waters does not fall below 31 psu (MBNMS, 2013b). Salinity tolerances of organisms present in Monterey Bay are discussed in detail in Section 4.5, Marine Biological Resources. In general, as discussed in detail in Section 4.5.5.2, the species present in the study area are tolerant of differing ranges of salinities depending on the organism and the life-stage in question. As an example, most cephalopods (e.g. squid) have an ideal range of salinity of 32 to 38 ppt, and are tolerant of salinities at levels outside this range. For general context, marine organisms in the study area have been demonstrated to tolerate salinities up to 36 ppt with no adverse effects on survival, growth, and behavior (see Table 4.5-9).

Bograd and Lynn (2003) compared nearshore salinity and temperatures in Monterey Bay during two periods: 1950-1976 and 1977-1999 and found very little variation. The difference in nearshore salinities between the periods was approximately 0.2 parts per thousand (ppt) or psu[7] and the difference in nearshore temperatures was approximately 1.4 °F. As such, the reported seasonal salinity and temperature is provided here as representative of baseline conditions. Additional temperature and salinity data is presented below as part of the characterization of

5 Unit used to measure salinity in terms of the concentration of dissolved salts in water. Equivalent to parts per thousand (ppt).
6 Upwelling is the process by which the warmer water at the ocean surface is pushed away by wind and replaced by colder, denser water that rises up from the subsurface.
7 The unit ppt is equivalent to psu.

ocean climate, seasonal ocean water density and physical processes (such as waves and currents) that influence water quality.

Dissolved Oxygen

Dissolved Oxygen (DO) is typically used as a general index for the health of receiving waters (such as in the *Water Quality Control Plan for Ocean Waters of California* or Ocean Plan, discussed below in Section 4.3.2.2). Adequate DO is vital for aquatic life and higher concentrations are generally considered to be desirable. Dissolved oxygen content in water is, in part, a function of water temperature and salinity (discussed above). The ability of oxygen to dissolve in water decreases as the temperature and salinity of water increases. As the temperature and/or salinity of water increases, water loses the ability to hold dissolved oxygen and the concentration goes down. Salinity also has properties that can facilitate the creation of hypoxic[8] zones. Because salt water is more dense than fresh water, under certain conditions (typically observed in estuaries and coastal lagoons), a less dense layer of fresh or low salinity water can form on top of a denser layer of high salinity water on the bottom. Such a scenario can prevent adequate mixing of the water column and prevent oxygenated water from getting to the lower depths, resulting in the heavier, saltier layer at the bottom to become oxygen-depleted. However, DO varies according to many other factors, including photosynthesis and biological and chemical oxygen demand associated with decomposition of organic material. Monterey Bay is a dynamic environment that includes variable concentrations of DO. Ambient DO levels in Monterey Bay at a depth of approximately 100 feet have ranged from 4.25 milligrams per liter (mg/L) to 8.00 mg/L (KLI, 1998; KLI, 1999); typically, DO in the range of 5 to 8 mg/L is considered protective of fish and marine biota depending on the species and life-stage.

Other Constituents

The water quality of Monterey Bay is a function, in part, of different constituents present in the water, as well as the seasonal ocean climate (discussed below) in the Bay that affects the concentration of the constituents present. The waters of Monterey Bay contain numerous legacy pesticides[9] such as organochlorine pesticides, Dieldrin and dichloro-diphenyl-trichloroethane (DDT), as well as chemical products in current use such as organophosphate pesticides, polynuclear aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs).[10] The largest source of contaminants is agricultural runoff into the Pajaro and Salinas Rivers. Seasonal data collected by the Central Coast Long-term Environmental Assessment Network11 (CCLEAN) between 2001 and 2013 indicate numerous instances where water quality objectives and human health alert levels in Monterey Bay were exceeded due to the presence of contaminants (CCLEAN, 2011 and

8 Hypoxia occurs when the amount of dissolved oxygen in water becomes too low to support most aquatic life (typically below 2 mg/l).

9 Legacy pesticides are persistent pesticides that have been banned from use but are still commonly found in the environment.

10 PCBs are also legacy contaminants.

11 CCLEAN is a long-term water quality monitoring program designed to help municipal agencies and resource managers protect the quality of the nearshore marine waters in the Monterey Bay. CCLEAN is a collaborative program between the cities of Watsonville and Santa Cruz, MRWPCA, Carmel Area Wastewater District, Dynegy Moss Landing Power Plant, and Central Coast Regional Water Quality Control Board (CCLEAN, 2013).

2014). Nearshore waters of Monterey Bay have failed to meet the Ocean Plan water quality objective for the protection of human health (i.e., concentrations are higher than numeric water quality objectives) for PCBs, Dieldrin, chlordanes, and DDTs. PCBs in the northern portion of Monterey Bay have increased significantly since 2006 and annual average concentrations across all samples have increased exponentially (CCLEAN, 2014). Annual data reported indicate that waters of Monterey Bay exceeded the Ocean Plan 30-day average PCB water quality objective of 1.9×10^{-5} micrograms per liter (µg/L)[12] for most of the years between 2004 and 2013. Additional details related to water quality objectives and Monterey Bay water quality is provided in Section 4.3.2.2, below, under the subsection California Ocean Plan Water Quality Objectives.

Monterey Bay also receives point source discharges from pipelines and other structures. These permitted discharges are subject to prohibitions and water quality requirements established by the Central Coast RWQCB such as effluent limitations, periodic monitoring, annual reporting, and other requirements designed to protect the overall water quality of Monterey Bay. (see Section 4.3.2, Regulatory Framework, below, for additional information regarding water quality regulations pertaining to MBNMS). In the project area, some of these permitted discharges include stormwater discharges from the cities of Sand City, Seaside, Monterey, Del Rey Oaks, and Pacific Grove, and unincorporated portions of Monterey County, and treated wastewater from the Monterey Regional Water Pollution Control Agency (MRWPCA) Regional Wastewater Treatment Plant located on Charles Benson Road in Marina. Another permitted point discharge in Monterey Bay is located 7 miles north of the project area in Moss Landing associated with a natural gas power plant operated by Dynegy, whose cooling water is discharged.[13]

Monterey Bay Ocean Climate

Ocean climate refers to oceanographic conditions, including temperature, salinity, current, and wave patterns prevailing over a period of time. An understanding of the ocean climate in Monterey Bay is important because the climatic conditions within the Bay influences the seasonal density of Bay receiving waters. The seasonal density of receiving waters is an important consideration related to the proposed operational discharges of the MPWSP and the mixing and dilution mechanics associated with such discharges that can influence receiving water quality. There are three known ocean climate seasons in Monterey Bay (Roberts, 2016):

- Upwelling Period: a wind-induced upwelling period that is characterized by strong currents, high salinities and cooler surface waters. Typically occurs March to September when steady northwesterly/westerly winds cause offshore transport of surface waters, resulting in deep, colder, nutrient-rich water to rise to the surface (upwelling).
- Oceanic or California Current Period: characterized by average currents, low salinity and warmer water. Typically occurs September to November when winds relax and upwelling ceases, allowing previously upwelled water to sink and be replaced by warm oceanic waters from offshore.

12 This objective for protection of human health is listed in the Ocean Plan and is discussed further in Section 4.3.2.2, State Regulatory Framework, below.
13 Based on *Waste Discharge Requirements Order No. 00-041 NPDES No. CA0006254* issued to Duke Energy North America Moss Landing Power Plant (RWQCB, 2000).

- Davidson Current Period (also called the "low thermal gradient phase"): characterized by slow currents and freshwater inputs (lower salinity). Typically occurs November to March when winter storm conditions prevail, causing downwelling in Monterey Bay and lower currents in the nearshore area.

These three individual seasons overlap extensively and do not recur with exact consistency. For more information on ocean climate seasons as they relate to water quality in Monterey Bay, see **Appendix D1** (Roberts, 2017) **and D2** (Flow Science Inc., 2014). Besides the ocean climate seasons, the physical mixing of the ocean water is influenced by the ocean water density, physical processes such as waves and currents, and physical features on the ocean floor. Baseline conditions characterizing each of these factors are described below.

As described above, the salinity and temperature of the ambient receiving ocean water determines its density, which in turn affects the mixing and dilution dynamics of discharges or surface waters (such as rivers, streams and stormwater) flowing into the ocean. Monthly measurements of conductivity-temperature-depth (CTD) were collected at four locations proximate to the MRWPCA outfall (see Figure 1 in **Appendix D1**) between February 2014 and December 2015 to document baseline ocean conditions. The profiles were averaged by ocean climate season (described above) to obtain representative water column densities, as well as salinity and temperature conditions near the seabed where the existing MRWPCA diffuser is located (**Table 4.3-1**).

TABLE 4.3-1
SEASONAL AVERAGE TEMPERATURE, SALINITY, AND DENSITY PROPERTIES AT MRWPCA OUTFALL DIFFUSER

Ocean Season	Temperature (°C)	Salinity (ppt)	Density (kg/m3)
Davidson	14.46	33.34	1024.8
Upwelling	11.48	33.89	1025.8
Oceanic	13.68	33.57	1025.1

SOURCE: Roberts, 2016.

The processes influencing the physical mixing of Bay receiving waters with inputs from other sources is enhanced by turbulence induced by currents and waves. Current velocities can be different throughout the water column. Tidally-driven currents can cause large pulses of water movement along the Monterey Submarine Canyon. Wave action, particularly during stormy periods, can vertically stir the water. The ocean water density and the physical processes (waves and currents) vary as a result of seasonal weather cycles and can also be severely modified by global ocean climate events, such as the Pacific Decadal Oscillation (SWRCB, 2012a).

Physical features on the ocean floor, such as regional bathymetry[14] and structures such as pipelines (which can influence localized mixing and dilution) also influence mixing and dilution

[14] National Oceanic and Atmospheric Administration (2014) refers to bathymetry as the ocean's depth relative to sea level, although it has come to mean "submarine topography," or the depths and shapes of underwater terrain.

dynamics. The bathymetry in the vicinity of the MRWPCA outfall structure is relatively flat with an average slope of 1 percent to the west of the diffuser for 5 miles. The rim of Monterey Submarine Canyon is less than 4 miles to the northwest of the project area.

4.3.1.4 Flooding

Flooding can occur when excessive precipitation generates stormwater runoff that exceeds the carrying capacity of the drainage system. Flooding can also occur due to dam or levee failure, tsunamis, especially high tides, coastal storms, and/or sea level rise.

Flood Hazard Zones

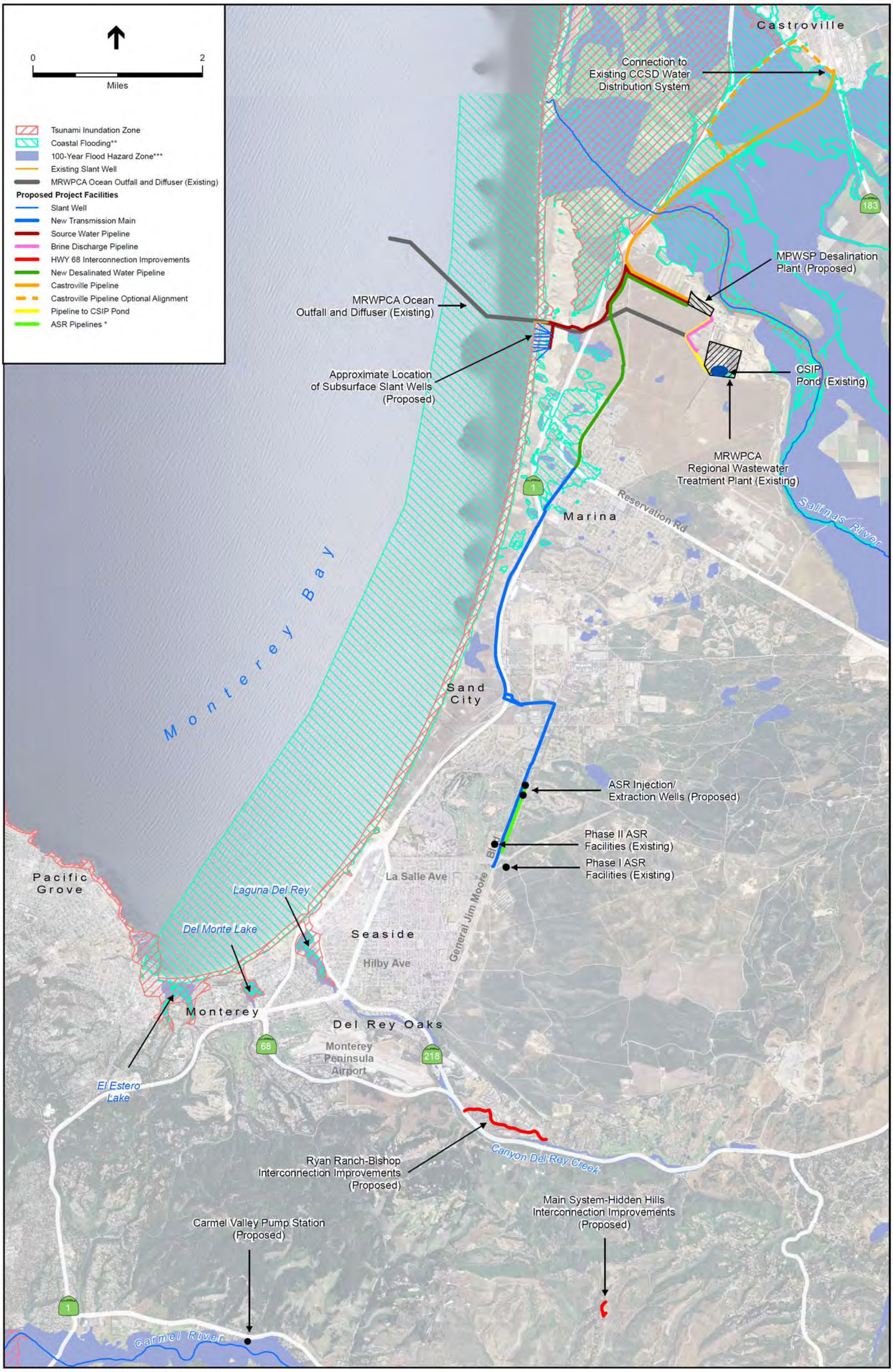
The Federal Emergency Management Agency (FEMA) delineates regional flooding hazard areas in Monterey County as part of the National Flood Insurance Program. Official Flood Insurance Rate Maps (FIRMs) for the project area indicate areas that have a 1 percent chance of flooding in any given year (100-year flood hazard zone). The 100-year flood hazard zones along the coast experience flooding coincident with high tide events typically combined with a wintertime storm surge. Significant flood events occurred in Monterey County in January 1995, March 1995, and February 1998 (MCWRA, 2013). During these events, major water bodies, including the Salinas River and Carmel River, experienced flooding and Monterey County was declared a federal disaster area.

The FEMA 100-year flood hazard zone in the project vicinity is shown in **Figure 4.3-2**. Portions of the proposed Source Water Pipeline and new Transmission Main in Marina; most of the Castroville Pipeline and Castroville Pipeline Optional Alignment 1 located north of the Salinas River, and the Carmel Valley Pump Station in unincorporated Monterey County are sited within a FEMA 100-year flood hazard zone. None of the other proposed facilities would be located within designated flood hazard areas.

Dam or Levee Failures

Dams located within the project vicinity include Los Padres Dam on the Carmel River; and Nacimiento and San Antonio Dams on the Salinas River. Historically, CalAm diverted surface water supplies from the Carmel River at Los Padres and San Clemente Dams to serve CalAm's Monterey District service area (Monterey District). However, the storage capacity of both dams was reduced substantially by the gradual accumulation of sediment over the years of operation (CCoWS, 2009; DWR, 2012). Los Padres Dam, built in response to an increase in sediment accumulation behind the downstream San Clemente Dam, has been reduced to 60 percent of original capacity. Removal of San Clemente Dam was completed in summer of 2015 (CalAm, 2016). Nacimiento and San Antonio Dams are owned and operated by the Monterey County Water Resources Agency (MCWRA).

The three remaining dams—Los Padres, Nacimiento, and San Antonio Dams—are regulated by the design and operational requirements established by the California Division of Safety of Dams (DSOD) and are administered by Monterey County. California Water Code Section 6000, et seq.



SOURCE: DWR, 2004; SWRCB, 2005; NOAA, 2012

NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

**Represents the extent of a 100-year coastal flood under current projections (year 2010) from Monterey Bay SLR study (ESA PWA 2014).

***Represents the 100-year FEMA floodplain.

205335.01 Monterey Peninsula Water Supply Project

Figure 4.3-2

Flood Hazards in the Project Area

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and 23 California Code of Regulations (CCR) 301, et seq. establish the authority and responsibility of the DSOD, including periodic safety inspections of dams, completion of studies that predict the flood zones created by sudden dam failure, and development of emergency response plans in the advent of pending dam failure, including a program for emergency warning and evacuation prepared by the Monterey County Office of Emergency Services (Monterey County, 2007). The DSOD requires the determination of a dam inundation area, which is an area downstream of a dam that would be inundated or otherwise affected by the failure of the dam and accompanying large flood flows (California Office of Emergency Services, 2011). Based on the County-wide dam inundation map, the Castroville Pipeline and Castroville Pipeline Optional Alignment 1 would be located within the dam inundation zone for Nacimiento and San Antonio Dams (Monterey County, 2010b).

In Monterey County, levees along portions of the Salinas and Carmel Rivers were constructed as part of U.S. Army Corps of Engineers or U.S. Department of Agriculture flood control projects, or by local flood control programs administered by the MCWRA and other stakeholders. All of these levees and floodwalls are required to undergo periodic inspections for safety and performance as part of routine maintenance plans (Monterey County, 2007).

Tsunami Hazards

A tsunami is a large wave or series of waves generated by an earthquake, volcanic eruption, or coastal landslide. Tsunami damage is typically confined to low-lying coastal areas. The United States Geologic Survey (USGS) evaluated the potential community exposure to tsunami hazards along the California coastline, including Monterey Bay (Wood et. al., 2013). The report estimated the maximum onshore wave run-up[15] from a tsunami would reach an elevation of 18.37 feet[16] in the city of Monterey. This degree of run-up would inundate a large portion of the city. Seaside and the unincorporated areas near the mouth of the Salinas River could also be subject to large areas of inundation (see **Figure 4.3-2**). Following the tsunami in Japan in 2011, the maximum wave height at Monterey Harbor was recorded at 2.4 feet (Monterey County, 2014).

The Monterey County Office of Emergency Services (OES) is responsible for developing and maintaining a state of readiness in preparation of any emergency, including tsunamis that could adversely affect any part of Monterey County (OES, 2010). According to the *Tsunami Incident Response Plan* prepared by the Monterey County OES and incorporated cities in the county, a locally generated tsunami may occur if a large enough earthquake occurs in or near Monterey Bay (OES, 2007). Such an earthquake could produce a tsunami that reaches shore in a matter of minutes. The plan states that within Monterey County, there is a low likelihood of experiencing a tsunami. The most likely tsunami, though still relatively unlikely compared to other hazards, is from a distant event, where there would be more than one hour to respond to a tsunami warning. The Tsunami Incident Response Plan lists individual response areas along the Monterey County

15 *Wave run-up* refers to the maximum vertical extent of a wave up rush on a beach or a structure.
16 The maximum onshore run-up elevation presented in the 2013 USGS report (Wood et. al., 2013) is based on modeled scenarios (for distant sources) and past events (for local sources).

and outlines the response agencies, evacuation routes, routes to avoid, safe areas, and special considerations for neighboring areas.

Coastal Flooding and Sea Level Rise

Coastal flooding can occur when there is a short- or long-duration increase in sea level during a period of extreme precipitation and runoff. Wave run-up along the coastal areas of Monterey County also contributes to coastal flooding. Wave run-up may cause coastal erosion by directly impacting coastal bluffs, dislodging material, and redistributing it to the foreshore and nearshore. Storms in the Pacific Ocean in the months of November through February, in conjunction with high tides and strong winds, can cause significant wave run-up.

Coastal flooding can be exacerbated by the physical characteristics of the continental shelf and shoreline. As part of the California Coastal Analysis and Mapping Project, FEMA is performing the Open Pacific Coast Study, a detailed coastal engineering analysis and mapping of the Pacific Coast of California. The results of the study will be used to remap the coastal flood risk and wave hazards for the California coastline, including Monterey County (FEMA, 2016).

Sea level rise at a global level is a phenomenon generally attributed to global climate change. Climate change is expected to result in more extreme weather events, both heavier precipitation events that can lead to flooding as well as more extended drought periods. According to a report by the Intergovernmental Panel on Climate Change (IPCC), the global average sea level rose at an average rate of 1.8 millimeters (0.07 inch) per year from 1961 to 2003 and at an average rate of about 3.1 millimeters (0.12 inch) per year from 1993 to 2003 (IPCC, 2007). The more recent Assessment Report predicts mean sea level could, depending on future emissions, rise by up to 7 meters (23 feet) over a millennium or more, assuming near-complete loss of the Greenland ice sheet (IPCC, 2014, p. 12).

The National Research Council estimates sea level in California to rise by 4.6 to 24 inches by 2050 and 17 to 66 inches by 2100 (NRC, 2012). The Pacific Institute report (2009) predicts that sea level rise along the California coast could increase by 55 inches by 2100. This projection may be an underestimation because the climate models used did not account for ice-melt from Antarctica and Greenland (Pacific Institute, 2009). Based on monthly mean sea level data from 1973 to 2006, the mean sea level in Monterey Bay is increasing by approximately 1.35 millimeters (0.053 inches) per year (NOAA, 2013a). Sea level rise will likely increase the rate of coastal erosion and related coastal hazards (see Section 4.2, Geology, Soils, and Seismicity for more information regarding coastal erosion and coastal hazards). As shown in **Figure 4.3-3**, within the project area, portions of the subsurface slant wells and Source Water Pipeline in Marina and the Castroville Pipeline in unincorporated Monterey County would lie in areas that would be subject to coastal flooding and sea level rise.

SOURCE: Pacific Institute, 2009

NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

205335.01 Monterey Peninsula Water Supply Project

Figure 4.3-3

Areas Subject to Sea Level Rise in the Project Area

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4.3.2 Regulatory Framework

This section provides an overview of federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as "regulatory requirements") relevant to surface water hydrology and water quality. A brief summary of each is provided, along with a finding regarding the project's consistency with those regulatory requirements. The consistency analysis is based on the project as proposed, without mitigation. Where the project, as proposed, would be consistent with the applicable regulatory requirement, no further discussion of project consistency with that regulatory requirement is provided. Where the project, as proposed, would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to the specific impact discussion in Section 4.3.5, Direct and Indirect Effects of the Proposed Project, below, where the potential inconsistency is addressed in more detail. Where applicable, the discussion in Section 4.3.5 identifies feasible mitigation that would resolve or minimize the potential inconsistency.

4.3.2.1 Federal Regulations

Clean Water Act

Under the Clean Water Act (CWA) of 1977, the United States Environmental Protection Agency (USEPA) seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters by implementing water quality regulations. The National Pollutant Discharge Elimination System (NPDES) permit program under section 402 of the CWA controls water pollution by regulating sources that discharge pollutants into waters of the United States. The USEPA has delegated authority of issuing NPDES permits in California to the California State Water Resources Control Board (SWRCB), which has nine regional boards. The Central Coast RWQCB regulates water quality in the project area (further discussion of the NPDES program and permits in California relevant to the proposed project is provided in Section 4.3.2.2, below). Additionally, determinations of consistency of the proposed MPWSP with specific applicable SWRCB regulations, plans and policies are provided in Section 4.3.2.2, below.

Section 303(d) List of Impaired Water Bodies and Total Maximum Daily Loads

Section 303(d) of the CWA requires that each State identify water bodies or segments of water bodies that are "impaired" (i.e., do not meet one or more of the water quality standards established by the state, even after point sources of pollution have been equipped with the minimum required levels of pollution control technology). Inclusion of a water body on the Section 303(d) List of Impaired Water Bodies triggers development of a Total Maximum Daily Load (TMDL) for that water body and a plan to control the associated pollutant/stressor on the list. The TMDL is the maximum amount of a pollutant/stressor that a waterbody can assimilate and still meet the water quality standards. Typically, a TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources.

Table 4.3-2 lists the impaired water bodies in the project area, including the pollutants that cause the impairments, and the potential sources of the pollutants.

TABLE 4.3-2
303(D) LIST OF IMPAIRED WATER BODIES IN THE PROJECT VICINITY

Water Body	Impairments/Pollutants
Salinas River	
Old Salinas River Estuary	Pesticides, Nutrients
Salinas Reclamation Canal	Ammonia (unionized), Chlorpyrifos, Copper, Diazinon, E. coli, Fecal Coliform, Low Dissolved Oxygen, Nitrate, Pesticides, pH, Priority Organics, Sediment Toxicity, Turbidity, Unknown Toxicity
Salinas River (Lower estuary to Gonzales Road crossing)	Chlordane, Chloride, Chlorpyrifos, DDD (Dichlorodiphenyldichloroethane), Diazinon, Dieldrin, Electrical Conductivity, E. coli, Fecal Coliform, Nitrate, PCBs, Pesticides, pH, Sodium, Total Dissolved Solids, Toxaphene, Turbidity, Unknown Toxicity
Salinas River Lagoon (North)	Nutrients, Pesticides
Tembladero Slough	Chlorophyll-a, Chlorpyrifos, Diazinon, Enterococcus, E. coli, Fecal Coliform, Nitrate, Nutrients, Pesticides, pH, Sediment Toxicity, Total Coliform, Turbidity, Unknown Toxicity
Carmel River	None
Lake El Estero	None
Del Monte Lake	None
Laguna del Rey	None
Monterey Bay	
Monterey Bay South (Coastline)	None
Monterey Harbor	None

SOURCE: RWQCB, 2015.

National Marine Sanctuaries Act, MBNMS Regulations and Desalination Guidelines

Pursuant to the National Marine Sanctuaries Act (NMSA or Act), originally referred to as the Marine Protection, Research, and Sanctuaries Act of 1972, the primary purpose of the NMSA is to identify, designate and manage areas of the marine environment of special national significance due to their conservation, recreational, ecological, historical, research, educational, or aesthetic qualities. Under the NMSA, it is unlawful for any person to destroy, cause the loss of, or injure any sanctuary resource managed under law or regulations for that sanctuary. NMSA general regulations define sanctuary resource as any living or nonliving resource that contributes to the conservation, recreational, ecological, historical, research, educational or aesthetic value of the sanctuary, including any algae and other marine plants, marine invertebrates, brine-seep biota, phytoplankton, zooplankton, fish, seabirds, sea turtles, and marine mammals.

MBNMS was designated in 1992 in recognition that the area provides a highly productive ecosystem and a wide variety of marine habitat, including outstanding concentrations of pinnipeds, whales, otters, and seabirds, abundant fish stocks, a variety of crustaceans, and invertebrates.

In addition to the statute, each sanctuary has unique regulatory prohibitions codified within a separate subpart of 15 CFR Part 922. Subpart M contains the regulations specific to MBNMS. The importance of sanctuary resources relevant to water quality is emphasized among the MBNMS statutory, regulatory, and management priorities. The importance of water quality to sanctuary resources is further emphasized in the 2008 MBNMS *Final Management Plan*, which includes a desalination action plan (MBNMS 2008). The desalination action plan details numerous strategies for the protection of MBNMS resources, including one to develop specific guidelines for desalination projects to be sited in MBNMS (discussed below).

MBNMS regulations that are relevant to the construction and operation of desalination plants include a prohibition on discharging material or other matter into the sanctuary and a prohibition on activities that alter the submerged lands (aka seabed) as a result of the installation of desalination facility structures on or beneath the ocean floor (e.g. an intake or outfall pipeline). In particular, MPWSP activities that would be subject to MBNMS approval include the seawater intake from aquifers below the ocean floor, and the discharge of brine into sanctuary ocean waters from an existing ocean outfall, approximately two miles off shore and 90-110 feet below sea level. Any actions that have the potential to alter the seabed would require an MBNMS Authorization of a Coastal Development Permit issued by the CCC. Operational discharges into sanctuary waters would require MBNMS authorization of an NPDES permit issued by the RWQCB (see Section 1.3.2 for additional information). NOAA may also issue Special Use Permits to establish conditions of access to, and use of, any sanctuary resource or to promote public use and understanding of a sanctuary resource. Special Use Permits may only be authorized if that activity is compatible with the purposes for which the sanctuary is designated and with protection of sanctuary resources; and that activities carried out under the permit be conducted in a manner that does not destroy, cause the loss of, or injure sanctuary resources. (See Section 1.3.2 for additional information.)

Guidelines for Desalination Plants in MBNMS

In 2010, MBNMS in collaboration with the California Coastal Commission, California Central Coast Regional Water Quality Control Board, and NOAA Fisheries, published a report titled *Guidelines for Desalination Plants in Monterey Bay National Marine Sanctuary* (MBNMS 2010), which implements the desalination action plan included in the MBNMS *Final Management Plan* (described above). These include non-regulatory guidelines that were developed to help ensure that any future desalination plants in the sanctuary would be sited, designed, and operated in a manner that results in minimal impacts on the marine environment. The Guidelines address numerous issues associated with desalination including site selection, construction and operational impacts, monitoring and reporting, plant discharges, and intake systems.

The following guidelines are pertinent to the analysis of impacts presented in Section 4.3.5:

- All desalination plants should be designed to minimize impacts from the discharge. Desalination project proponents should investigate the feasibility of diluting brine effluent by blending it with other existing discharges. The proponent should evaluate the use of measures to minimize the impacts from desalination plant discharges including discharging to an area with greater circulation or at a greater depth, increasing in the number of diffusers, increasing the velocity while minimizing the volume at each outlet, diluting the brine with seawater or another discharge, or use of a subsurface discharge structure. The project proponent should provide a detailed evaluation of the projected short-term and long-term impacts of the brine plume on marine organisms based on a variety of operational scenarios and oceanographic conditions. Modeling should address different types of seasonal ocean circulation patterns, including consideration of "worst case scenarios."

- Results of accepted plume models should be included, to illustrate how the plume will behave during variable oceanographic conditions. The plume model should estimate salinity concentrations at the discharge point, as well as where and when it would reach ambient ocean concentrations. The extent, location, and duration of the plume where the salinity is 10 percent above ambient salinity should also be provided.
- The project proponent should provide information on the physical and chemical parameters of the brine plume including salinity, temperature, metal concentrations, pH, and oxygen levels. These water quality characteristics of the discharge should conform to California Ocean Plan requirements and should be as close to ambient conditions of the receiving water as feasible.
- A continuous monitoring program should be implemented to verify the actual extent of the brine plume, when deemed necessary (see Monitoring on page 4.3-13) and to determine if the plume is impacting Essential Fish Habitat (EFH), critical habitat, or sanctuary resources. If it is, then mitigation for the EFH impact will be required.

The issues discussed in the Guidelines relating to siting, constructing, and operating a desalination facility within MBNMS and the recommendations for reducing, avoiding, and minimizing impacts on sanctuary resources are reflected in the requirements of the California Ocean Plan (described in detail under State Regulations in Section 4.3.2.2, below). The Ocean Plan was recently amended (effective January, 2016) to specifically control potential adverse impacts on marine life associated with desalination facility intakes using seawater as source water and brine discharges. Further, the Ocean Plan includes specific enforceable numeric water quality objectives and other requirements pertaining to siting, constructing, and operating a desalination facility that are consistent with the Guidelines. The requirements set forth in the Ocean Plan were informed by the SWRCB collaborating with the Southern California Coastal Water Research Project to evaluate methods of brine disposal and monitoring strategies. Additionally, the amendments to the Ocean Plan were assessed in a SWRCB staff report analyzing desalination facility intakes and brine discharges which provides the rationale for how implementing such measures reduce potential environmental impacts from desalination facilities (SWRCB, 2015). To reflect this evolution of regulatory requirements supported by evidence based research, the Ocean Plan requirements are used, in part, as key thresholds of significance in the evaluation criteria for assessing impacts. The Ocean Plan requirements are generally more stringent and have more specificity regarding assessment and monitoring requirements than the Guidelines. As such, the Ocean Plan requirements are substantially consistent with the Guidelines. Section 6.4 includes a comprehensive list of Guideline recommendations and summarizes the proposed project's consistency with those guidelines.

As proposed, the MPWSP would involve water quality and marine biological resource impacts that could indirectly affect Sanctuary managed resources in a manner that would be potentially inconsistent with the provisions of the National Marine Sanctuaries Act as well as the guidelines (MBNMS, 2010) that relate to water quality and associated MBNMS managed resources for desalination plants in MBNMS. Impacts on sanctuary resources from brine discharges, and mitigation measures to avoid the impacts, are discussed in detail in Impact 4.3-4 and Impact 4.3-5 as well as in Section 4.5, Marine Biological Resources.

NOAA (MBNMS) Memorandum of Agreement with State and Federal Agencies

NOAA (MBNMS) entered into a Memorandum of Agreement (MBNMS, 2016e) with the State of California, USEPA, and the Association of Monterey Bay Area Governments, which addresses the process for implementing the following water quality regulations applicable to State waters within MBNMS (MBNMS, 2013a):

- NPDES permits issued by the State of California under Section 13377 of the California Water Code; and
- Waste Discharge Requirements issued by the State of California under Section 13263 of the California Water Code.

The Memorandum of Agreement specifies how the review process for applications for leases, licenses, permits, approvals, or other authorizations will be administered within State waters in MBNMS in coordination between the State and the Sanctuary's permit programs. The MBNMS Superintendent develops and follows a management plan that ensures protection of these resources, provides for research and education, and facilitates recreational and commercial uses that are compatible with the primary goal of resource protection. MBNMS also implements the Water Quality Protection Program to enhance and protect the chemical, physical, and biological integrity of the sanctuary. The program is a partnership of many local, state, and federal government agencies and calls for education, funding, monitoring, and development of treatment facilities and assessment programs to protect water quality (MBNMS, 2016c). The MPWSP would be consistent with the requirements outlined above because, prior to issuance of any permits or licenses, a review and authorization process by MBNMS is required to ensure such permits and licenses are protective of MBNMS resources and are consistent with relevant plans, policies, and guidelines.

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972 provides for management of the nation's coastal resources, including the Great Lakes, and balances economic development with environmental conservation. In 1990, Congress passed the Coastal Zone Act Reauthorization Amendments (CZARA) to address nonpoint source pollution problems in coastal waters. The California Coastal Commission has jurisdiction for CZMA implementation throughout the state.[17]

[17] Except within the San Francisco Bay-Delta where the Bay Conservation and Development Commission has authority for implementation of CZMA within its jurisdictional area.

Section 6217 of CZARA and Section 319 of the CWA require California and 28 other states to develop coastal nonpoint source pollution control programs that incorporate required management measures to reduce or prevent polluted runoff to coastal waters from specific sources. Management measures are defined in Section 6217 of the CZARA as economically achievable measures to control the addition of pollutants to coastal waters, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. These management measures are incorporated by states into their coastal nonpoint source pollution programs (USEPA, 1993) and coastal management programs. (See Section 4.3.2.2, below, for additional discussion of how the CZMA is regulated at the state level.)

The California Coastal Act contains numerous enforceable policies that are directed at protecting and, where feasible, restoring coastal water quality. The California Coastal Commission applies the Coastal Act's water quality policies when reviewing applications for coastal development permits in California state waters. The Coastal Commission also applies the water quality policies when reviewing federally licensed and permitted activities to ensure they are consistent with the State's coastal management program in accordance with the CZMA federal consistency provision.

The Coastal Commission considers an application for a coastal development permit to cover the requirement for an applicant submitting a consistency certification to the Coastal Commission if the activity is located in state waters. Typically, the Coastal Commission will provide its response (concurrence, conditional concurrence, or objection) in its staff report for the coastal development permit.

Executive Order 11988 and National Flood Insurance Program

Under Executive Order 11988, Floodplain Management of May 24, 1977, FEMA is responsible for management of floodplain areas defined as the lowland and relatively flat areas adjoining inland and coastal waters subject to a one percent or greater chance of flooding in any given year. Also, FEMA administers the National Flood Insurance Program, which requires that local governments covered by federal flood insurance enforce a floodplain management ordinance that specifies minimum requirements for any construction within the 100-year flood zone (one percent chance of occurring in a given year). FEMA prepares Flood Insurance Rate Maps (FIRMs) that that indicate areas prone to flooding. MCWRA is responsible for issuing permits within designated flood zones in the project area and would ensure consistency with requirements for development within a floodplain. Local municipalities are responsible for permitting development on floodplains within their jurisdictions.

4.3.2.2 State Regulations

Porter-Cologne Water Quality Control Act

The Porter-Cologne Act (Division 7 of the California Water Code) provides the basis for water quality regulation within California and defines water quality objectives as the limits or levels of water constituents that are established for reasonable protection of beneficial uses. The Porter-

Cologne Act allows the California SWRCB to adopt statewide water quality control plans (such as “Basin Plans” as well as the California Ocean Plan) which serve as the legal, technical, and programmatic basis of water quality regulation for a region or along the coast. The Act also authorizes the NPDES program under the CWA, which establishes effluent limitations and water quality requirements for discharges to waters of the state. The California Ocean Plan, Basin Plan for the Central Coast and the NPDES permits relevant to the proposed MPWSP are discussed further below, as well as determinations of consistency of the MPWSP with these regulatory requirements.

California Toxics Rule

Under the California Toxics Rule (CTR), the USEPA has proposed water quality criteria for priority toxic pollutants for inland surface waters, enclosed bays, and estuaries. These federally promulgated criteria create water quality standards for California waters. The CTR satisfies CWA requirements and protects public health and the environment. The USEPA and the SWRCB have the authority to enforce these standards, which are incorporated into the NPDES permits (discussed below) that regulate existing discharges in the project area. The MPWSP would be consistent with the CTR requirements because such requirements would be incorporated into NPDES permits applicable to construction and operation of the MPWSP and CalAm would be required to comply with the permit requirements.

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) provides for the long-term management of lands within California’s coastal zone boundary. The Coastal Act includes specific policies for management of natural resources and public access within the coastal zone. Of primary relevance to surface water hydrology and water quality are Coastal Act policies concerning protection of the biological productivity and quality of coastal waters. For example, Article 4 of the Act details policies related to the marine environment, such as biological productivity and water quality. Specifically, and relevant to surface water hydrology and water quality, the Act requires the quality of coastal waters, streams, wetlands, estuaries appropriate to maintain optimum populations of marine organisms and for the protection of human health, to be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges, controlling runoff, and substantial interference with surface waterflow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams (Cal. Pub. Res. Code §§ 30231).

A preliminary assessment of project consistency with these priorities is provided here. Final determinations regarding project consistency are reserved for the Coastal Commission. Operational discharges of the MPWSP under certain scenarios may exceed Ocean Plan water quality objective thresholds. Exceedances of these thresholds would be potentially inconsistent with Coastal Act policies. This issue is discussed further in Impact 4.3-5.

State Marine Protected Areas

Within Monterey Bay, there are three conservation areas relevant to the study area (shown in **Figure 4.3-1**): Pacific Grove State Marine Conservation Area, Edward F. Ricketts State Marine Conservation Area, and Lovers Point State Marine Reserve, designated as such under the Marine Life Protection Act and administered by the California Department of Fish and Wildlife. These designated areas are further discussed in Section 4.5, Marine Biological Resources.

California Ocean Plan

The *Water Quality Control Plan for Ocean Waters of California* (or Ocean Plan; SWRCB, 2016), adopted by the SWRCB in May 2015 and effective January 2016, establishes water quality objectives and beneficial uses for waters of the Pacific Ocean adjacent to the California Coast outside of estuaries, coastal lagoons, and enclosed bays. The Ocean Plan establishes effluent quality requirements and management principles for specific waste discharges. The Ocean Plan was recently amended to establish a receiving water limitation for brine discharges from desalination facilities (discussed in detail under Salinity, below), and to ensure the protection of beneficial uses by establishing a consistent statewide analytic framework for new desalination facilities for the best available site, design, technology, and mitigation measures feasible in order to minimize intake and mortality of all forms of marine life. The water quality requirements and objectives of the Ocean Plan are incorporated into NPDES permits for ocean discharges, such as the *Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant* (Order No. R3-2014-0013, NPDES Permit No. CA0048551) for discharges of treated wastewater from the MPWPCA Regional Wastewater Treatment Plant to Monterey Bay (MRWPCA's NPDES permit is discussed in more detail below).

The 2016 Ocean Plan includes the following provisions that are applicable to the proposed project:

- Waste management systems that discharge into the ocean must be designed and operated in a manner that will maintain the indigenous marine life and a healthy and diverse marine community.
- Waste discharged to the ocean must be essentially free of substances that will accumulate to toxic levels in marine waters, sediments or biota.
- Waste effluents must be discharged in a manner which provides sufficient initial dilution to minimize the concentrations of substances not removed in treatment.

The Ocean Plan prohibits discharges into Areas of Special Biological Significance (ASBS), except with an approved exception. ASBS are designated by the SWRCB (**Figure 4.3-1**) and require protection of species or biological communities to the extent that alteration of natural water quality is undesirable. In the Monterey region, Old Salinas River Estuary, Pacific Grove, Carmel Bay, and Point Lobos are designated as ASBS and are located near Monterey Bay within the boundaries of MBNMS (SWRCB, 2013a). **Table 4.3-3** below lists the water bodies in the project area described above along with beneficial uses identified by the Central Coast RWQCB.

TABLE 4.3-3
DESIGNATED BENEFICIAL USES OF SURFACE WATER BODIES IN THE PROJECT VICINITY

	Beneficial Uses																			
Water Bodies	**MUN**	**AGR**	**GWR**	**IND**	**COMM**	**SHELL**	**COLD**	**EST**	**MIGR**	**RARE**	**SPWN**	**BIOL**	**WARM**	**WILD**	**REC-1**	**REC-2**	**NAV**	**MAR**	**FRSH**	**ASBS**
Salinas Reclamation Canal					X								X	X	X	X				
Tembladero Slough					X	X		X		X	X		X	X	X	X				
Old Salinas River Estuary					X	X	X	X	X	X	X	X	X	X	X	X				
Salinas River Lagoon (North)					X	X	X	X	X	X	X	X	X	X	X	X				
Pacific Ocean (Monterey Bay)				X	X	X			X	X	X			X	X	X	X	X		X
Carmel River	X	X	X	X	X		X		X	X	X	X	X	X	X	X			X	
Carmel River Estuary			X		X	X	X	X	X	X	X	X		X	X	X				
Carmel Bay				X	X	X				X					X	X		X		X

ACRONYMS:
MUN – Municipal and Domestic Supply
IND – Industrial Service Supply
COLD – Cold Freshwater Habitat
REC-2 – Non-Contact Water Recreation
FRSH – Freshwater Replenishment
REC-1 – Water Contact Recreation
SPWN – Spawning, Reproduction, and/or Early Development
BIOL – Preservation of biological Habitats of Special Significance
AGR – Agricultural Supply
COMM – Ocean, Commercial, and Sport Fishing
MIGR – Migration of Aquatic Organisms,
RARE – Preservation of Rare and Endangered Species
ASBS – Areas of Special Biological Significance
WARM – Warm Freshwater Habitat
GWR – Groundwater Recharge
SHELL – Shellfish Harvesting
EST – Estuarine Habitat
WILD – Wildlife Habitat
NAV – Navigation

SOURCE: RWQCB, 2011b; 2014.

The recently amended Ocean Plan also contains the following four primary components intended to control potential adverse impacts on marine life associated with desalination facility intakes using seawater as source water and brine discharges (SWRCB, 2015; 2016):

1. Clarify SWRCB's authority over desalination facility intakes and discharges;
2. Provide guidance to the regional water boards regarding the determination required by Water Code section 13142.5 (b) for the evaluations of the best available site, design, technology, and mitigation measures to minimize the intake and mortality of marine life at new or expanded desalination facilities.
3. A narrative receiving water limitation for salinity applicable to all desalination facilities to ensure that brine discharges to marine waters meet the biological characteristics' narrative water quality objective[18] and do not cause adverse effects to aquatic life beneficial uses.
4. Monitoring and reporting requirements that include effluent monitoring, as well as monitoring of the water column bottom sediments and benthic community health to ensure that the effluent plume is not harming aquatic life beyond the brine mixing zone (BMZ).

18 The 2016 Ocean Plan Section II. E (biological characteristics water quality objective) requires that, "marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded."

To inform the recent amendments to the Ocean Plan, the SWRCB contracted with the Southern California Coastal Water Research Project to evaluate methods of brine disposal and monitoring strategies, which resulted in a technical report on *Management of Brine Discharges to Coastal Waters* (SWRCB, 2012a). Additionally, the amendments to the Ocean Plan were assessed in a SWRCB staff report analyzing desalination facility intakes and brine discharges (SWRCB, 2015). The SWRCB (2015) staff report assessed the proposed Ocean Plan amendments and provides the rationale for how implementing such measures reduce potential environmental impacts from desalination facilities. As discussed in Section 4.3.2.1, above, the Ocean Plan requirements pertaining to desalination facilities are substantially consistent with the recommendations described in the *Guidelines for Desalination Plants in Monterey Bay National Marine Sanctuary* (MBNMS 2010) for siting and operating a desalination facility within MBNMS to reduce, avoid, and minimize impacts on sanctuary resources.

The SWRCB (2015) states, "subsurface intakes extract marine water from beneath the ground, filtering the seawater through the geological features of the sea floor. Because the water is naturally filtered as it moves through sediments, it generally contains lower levels of contaminants such as suspended solids, silts, organic contaminants, oil, and grease. Similarly, subsurface intakes provide a natural barrier to suspended sediments … dissolved or suspended organic compounds …debris, or oil or chemical spills…. This gives subsurface intakes a significant environmental advantage over surface water intakes because mitigation for surface intake entrainment has to occur throughout the operational lifetime of the facility." Such findings are also relevant to the water quality or the constituent concentrations found in Monterey Bay where the seawater extracted from the bay through the subsurface intakes would be used as source water for the MPWSP Desalination Plant. The SWRCB acknowledges that slant wells also minimize aboveground shoreline structures and can provide substantially greater length of well screen in the target aquifer, an important advantage when there is limited aquifer thickness (SWRCB, 2015). The SWRCB recommends the option of using subsurface intakes as its preferred technology and allowing surface water intakes where subsurface intakes are found infeasible (SWRCB, 2015). These recommendations are reflected in the current requirements of the 2016 Ocean Plan for new desalination facilities along the California coast (discussed below).

Concerning brine discharge from a desalination plant, the Ocean Plan requires an owner or operator to first evaluate the availability and feasibility of diluting brine by commingling it with wastewater. If wastewater is unavailable, then multiport diffusers are the next preferred method of brine disposal (SWRCB, 2016). Consistent with such measures, the brine discharge from the MPWSP Desalination Plant is proposed to be discharged through a multiport diffuser of an existing outfall and commingled with the MRWPCA wastewater that is currently discharged through the outfall whenever the wastewater is available (see the water quality impact related to the brine discharge in Section 4.3.5 Direct and Indirect Effects of the Proposed Project).

Ocean Plan Water Quality Objectives

To protect the beneficial uses of the surface water bodies shown in **Table 4.3-3**, the Ocean Plan establishes water quality objectives for bacterial, physical, chemical, biological, and radioactive constituents (**Table 4.3-4**). The Ocean Plan water quality objectives are to be met after the initial dilution of a discharge into the ocean. The Ocean Plan defines initial dilution as the process which results in the rapid and irreversible turbulent mixing of wastewater with ocean water around the point of discharge. Initial dilution occurs in an area known as the zone of initial dilution (ZID), within which the density of the discharge is substantially different from that of the receiving water. Typically, constituent concentrations are permitted to exceed water quality objectives within the ZID, which is limited in size. Thus, in the case of MPWSP, the Ocean Plan water quality objectives would apply to the edge of the ZID (Flow Science, Inc., 2014 in **Appendix D2**). Dilution occurring within the ZID from an operational discharge is conservatively calculated as the minimum probable initial dilution (Dm). The water quality objectives established in the Ocean Plan are considered in the context of the calculated Dm to derive the NPDES effluent limits for a wastewater discharge in-pipe (i.e., prior to ocean dilution).

For typical wastewater discharges, the ZID is the zone adjacent to the discharge point where momentum and buoyancy-driven mixing produces rapid dilution of the discharged effluent (Flow Science, Inc., 2014; SWRCB, 2012a). Municipal wastewater effluent, being effectively freshwater, is less dense than seawater and thus rises (due to buoyancy) while it mixes with ocean water, whereas desalination brine, when discharged directly, is more dense than seawater and thus sinks while it mixes with ocean water. The mixing and dilution are also affected by the density of the effluent being discharged. **Figure 4.3-4** illustrates the likely trajectories of positively and negatively buoyant effluent plumes from a horizontal discharge (such as that proposed as part of the MPWSP) for illustrative purposes. As effluent travels away from the discharge port, it entrains ambient seawater, which increases the diameter of the plume and decreases the plume concentration. Thus, the edge of the ZID depends, in part, on the discharge plume density. If the effluent density is lower than the ambient salinity, it rises and becomes a buoyant plume (see **Figure 4.3-4a**). Here, the edge of the ZID is located at the point where the effluent plume reaches the water surface or attains a depth level where the density of the diluted effluent plume becomes the same as the density of ambient water (i.e., the “trap” level). The effluent plume spreads within and beyond the trap level and forms a rising plume. If the effluent density is greater than the ambient salinity, it produces a negatively buoyant plume that sinks toward the seabed (see **Figure 4.3-4b**). In this case, the edge of the ZID is located at the point where the discharge plume contacts the sea floor.

In addition to establishing water quality objectives, the Ocean Plan lays out the implementation provisions with an equation to derive constituent concentrations that are compared with the water quality objectives. The constituent concentrations are calculated using the background concentrations of the constituents as one of the factors.[19] The background concentrations are provided for only five constituents: arsenic, copper, mercury, silver, and zinc; and for other constituents it is assumed to be zero (SWRCB, 2016).

[19] The calculation also uses the constituent concentrations and dilution factor estimated for the discharge that is studied.

TABLE 4.3-4
WATER QUALITY OBJECTIVES IN THE 2016 OCEAN PLAN

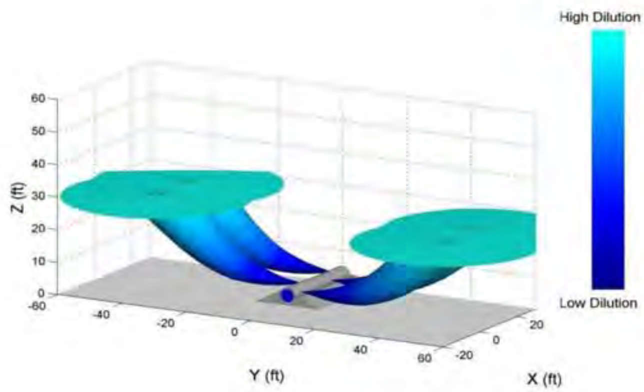
Water Quality Objectives for Protection of Marine Life				
		Limiting Concentrations		
	Units of Measurement	**6-month Median**	**Daily Maximum**	**Instantaneous Maximum**
Arsenic	µg/L	8	32	80
Cadmium	µg/L	1	4	10
Chromium (Hexavalent)	µg/L	2	8	20
Copper	µg/L	3	12	30
Lead	µg/L	2	8	20
Mercury	µg/L	0.04	0.16	0.4
Nickel	µg/L	5	20	50
Selenium	µg/L	15	60	150.
Silver	µg/L	0.7	2.8	7
Zinc	µg/L	20	80	200
Cyanide	µg/L	1	4	10
Total Chlorine Residual	µg/L	2	8.0	60
Ammonia (expressed as Nitrogen)	µg/L	600	2400	6000
Acute Toxicity	TUa	N/A	0.3	N/A
Chronic Toxicity	TUc	N/A	1	N/A
Phenolic Compounds (non-chlorinated)	µg/L	30	120	300
Chlorinated Phenolics	µg/L	1	4	10
Endosulfan	µg/L	0.009	0.018	0.027
Endrin	µg/L	0.002	0.004	0.006
HCH	µg/L	0.004	0.008	0.012
Radioactivity	Not to exceed limits specified in Tile 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, Section 30253 of the California Code of Regulations.			

Water Quality Objectives for Protection of Human Health-Noncarcinogens		
	30-day Average (micrograms per liter or µg/L)	
Chemical	**Decimal Notation**	**Scientific Notation**
acrolein	220	2.2×10^{2}
antimony	1,200	1.2×10^{3}
bis(2-chloroethoxy) methane	4.4	4.4×10^{0}
bis(2-chloroisopropyl) ether	1,200	1.2×10^{3}
chlorobenzene	570	5.7×10^{2}
chromium (III)	190,000	1.9×10^{5}
di-n-butyl phthalate	3,500	3.5×10^{3}
dichlorobenzenes	5,100	5.1×10^{3}
diethyl phthalate	33,000	3.3×10^{4}
dimethyl phthalate	820,000	8.2×10^{5}
4,6-dinitro-2-methylphenol	220	2.2×10^{2}
2,4-dinitrophenol	4.0	4.0×10^{0}
ethylbenzene	4,100	4.1×10^{3}
fluoranthene	15	1.5×10^{1}
hexachlorocyclopentadiene	58	5.8×10^{1}
nitrobenzene	4.9	4.9×10^{0}
thallium	2	$2. \times 10^{0}$
toluene	85,000	8.5×10^{4}
tributyltin	0.0014	1.4×10^{-3}
1,1,1-trichloroethane	540,000	5.4×10^{5}

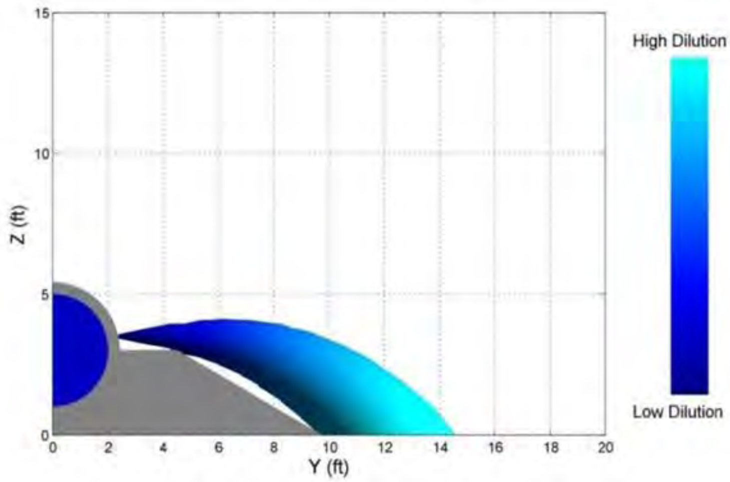
TABLE 4.3-4 (Continued)
WATER QUALITY OBJECTIVES IN THE 2016 OCEAN PLAN

Water Quality Objectives for Protection of Human Health-Carcinogens		
Chemical	30-day Average (micrograms per liter or µg/L)	
	Decimal Notation	Scientific Notation
acrylonitrile	0.10	1.0×10^{-1}
aldrin	0.000022	2.2×10^{-5}
benzene	5.9	5.9×10^{0}
benzidine	0.000069	6.9×10^{-5}
beryllium	0.033	3.3×10^{-2}
bis(2-chloroethyl) ether	0.045	4.5×10^{-2}
bis(2-ethylhexyl) phthalate	3.5	3.5×10^{0}
carbon tetrachloride	0.90	9.0×10^{-1}
chlordane	0.000023	2.3×10^{-5}
chlorodibromomethane	8.6	8.6×10^{0}
chloroform	130	1.3×10^{2}
DDT	0.00017	1.7×10^{-4}
1,4-dichlorobenzene	18	1.8×10^{1}
3.3'-dichlorobenzidine	0.0081	8.1×10^{-3}
1,2-dichloroethane	28	2.8×10^{1}
1,1-dichlorethylene	0.9	9×10^{-1}
dichlorobromomethane	6.2	6.2×10^{0}
dichloromethane	450	4.5×10^{2}
1,3-dichloropropene	8.9	8.9×10^{0}
dieldrin	0.00004	4.0×10^{-5}
2,4-dinitrotoluene	2.6	2.6×10^{0}
1,2-diphenylhydrazine	0.16	1.6×10^{-1}
halomethanes	130	1.3×10^{2}
heptachlor	0.00005	5×10^{-5}
heptachlor epoxide	0.00002	2×10^{-5}
hexachlorobenzene	0.00021	2.1×10^{-4}
hexachlorobutadiene	14	1.4×10^{1}
hexachloroethane	2.5	2.5×10^{0}
isophorone	730	7.3×10^{2}
N-nitrosodimethylamine	7.3	7.3×10^{0}
N-nitrosodi-N-propylamine	0.38	3.8×10^{-1}
N-nitrosodiphenylamine	2.5	2.5×10^{0}
Polyaromatic hydrocarbons (PAHs)	0.0088	8.8×10^{-3}
Polychlorinated biphenyls (PCBs)	0.000019	1.9×10^{-5}
TCDD equivalents	0.0000000039	3.9×10^{-9}
1,1,2,2-tetrachloroethane	2.3	2.3×10^{0}
tetrachloroethylene	2.0	2.0×10^{0}
toxaphene	0.00021	2.1×10^{-4}
trichloroethylene	27	2.7×10^{1}
1,1,2-trichloroethane	9.4	9.4×10^{0}
2,4,6-trichlorophenol	0.29	2.9×10^{-1}
vinyl chloride	36	3.6×10^{1}

SOURCE: SWRCB, 2016.



(a) Illustration of a Rising Plume



(b) Illustration of a Sinking Plume

SOURCE: Flow Science, Inc., 2014 (see Appendix D2)

Figure 4.3-4
Illustrations of the Trajectory and Behavior of a Brine Discharge Plume

As discussed under Other Constituents in Section 4.3.1.3, Surface Water Quality, above, near-shore water quality in Monterey Bay is monitored by the Central Coast Long-term Environmental Assessment Network (CCLEAN). The CCLEAN program design includes some, but not all constituents that are regulated by the Ocean Plan (listed in **Table 4.3-4**). A review of the most recent monitoring data reported under CCLEAN for the past 8 years (2008-2015) indicates exceedances of maximum concentrations of several constituents over the water quality objectives listed in **Table 4.3-4**. **Table 4.3-5** below summarizes exceedances (denoted in bold) of Ocean Plan water quality objectives listed in **Table 4.3-4** documented under baseline conditions under CCLEAN. Aldrin was not detected.

**TABLE 4.3-5
WATER QUALITY IN MONTEREY BAY
(CONSTITUENT CONCENTRATIONS REPORTED UNDER CCLEAN 2008-2015)**

Constituent	Reported Average Concentration (µg/L)*	Reported Maximum Concentration (µg/L)*	Ocean Plan Water Quality Objectives (µg/L)
Endosulfan	0.0000039	0.0000390	0.009 (6-month median)
Endrin	0.0000006	0.0000160***	0.002 (6-month median)
HCH	0.0001679	0.0003930	0.004 (6-month median)
Fluoranthene	0.0003068	0.0010800	15 (6-month median)
Aldrin**	0.0000000	0.0000000**	0.000022 (30-day average)
Chlordane	0.0000155	**0.0001140**	0.000023 (30-day average)
DDT	0.0000548	**0.0003190**	0.00017 (30-day average)
Dieldrin	0.0000168	**0.0000510**	0.00004 (30-day average)
Heptachlor	0.0000003	0.0000050	0.00005 (30-day average)
Polyaromatic hydrocarbons (PAHs)	0.0000007	0.0000050	0.0088 (30-day average)
Polychlorinated biphenyls (PCBs)	**0.0023236**	**0.0069071**	0.000019 (30-day average)
Toxaphene**	0.0001414	**0.0012139*****	0.00021 (30-day average)

NOTES:
* Concentrations higher than the Ocean Plan water quality objectives in Table 4.3-4, above, **are shown in bold**.
** Aldrin was not detected.
*** Endrin and Toxaphene were detected in 1 and 2 samples, respectively.

SOURCE: CCLEAN, 2016.

As shown in **Table 4.3-5**, maximum concentrations detected in Monterey Bay for chlordane, dieldrin, DDT, and both average and maximum concentrations of PCBs currently exceed the Ocean Plan water quality objectives. In the case of endrin, aldrin, and toxaphene, the actual average and maximum concentrations are shown. In the case of toxaphene, the average value of the range of reporting limits used also exceeded the water quality objectives. In summary, the background concentrations or ambient levels of constituents in Monterey Bay vary with time. The exceedances in **Table 4.3-5** are used as a conservative estimate using representative data and are considered as baseline or existing water quality conditions in the bay in the impact analysis discussed in Section 4.3.5 Direct and Indirect Effects of the Proposed Project, below. Operational discharges of the MPWSP under certain scenarios would be potentially inconsistent with the provisions of the Ocean Plan water quality objectives because, in the absence of mitigation measures, the brine may exceed water quality objective thresholds at the edge of the ZID. This issue is discussed further in Impact 4.3-5.

Ocean Plan Salinity Requirements

The current Ocean Plan includes new requirements to address brine discharges from desalination facilities along the California coast. The most relevant of these to the proposed MPWSP is contained in Section III.M.3, "Receiving Water Limitation for Salinity". The receiving water limitation for salinity requires that discharges not exceed a daily maximum of two (2) parts per thousand (ppt) above natural background salinity measured no further than 100 meters (328 ft) horizontally from each discharge point, representing the Brine Mixing Zone (BMZ)[20] the actual shape of which is determined by the diffuser. The value of 2 ppt represents the maximum incremental increase above natural background salinity allowed at the edge of the BMZ. There is no vertical limit to this zone and to determine the effluent limit necessary to meet the receiving water limitation, the Ocean Plan includes a required methodology for brine discharges. In addition, the owner or operator of a desalination facility must meet the dilution standard at the edge of the BMZ or minimum initial dilution (Dm; discussed above), whichever is smaller. Dilution must be determined using applicable water quality models that have been approved by the regional water boards in consultation with State Water Board staff. Operational discharges of the MPWSP would be consistent with the provisions of the Ocean Plan salinity requirements because all operational discharge scenarios would be below the specified maximum incremental increase of 2 ppt above natural background salinity allowed at the edge of the BMZ (see **Impact 4.3-4** for details).

Ocean Plan Monitoring Requirements

Included in the recent amendments to the Ocean Plan is the requirement for a monitoring and reporting program (Section III.M.4, “Monitoring and Reporting Program”; SWRCB, 2016). The monitoring requirements for operation of a new desalination facility are such that the owner or operator of a desalination facility must submit a Monitoring and Reporting Program to the regional water board for approval. The Monitoring and Reporting Program must include provisions for monitoring of effluent and receiving water characteristics and impacts on all forms of marine life. The Monitoring and Reporting Program must, at a minimum, include monitoring for benthic community health, aquatic life toxicity, hypoxia, and receiving water characteristics. Further, the Monitoring and Reporting Program must be consistent with the standard monitoring procedures detailed in Appendix III of the Ocean Plan, which specifies monitoring plan framework, scope, and methodological design and additional details for determining compliance with the receiving water limitation in chapter III.M.3. Additionally, receiving water monitoring for salinity must be conducted at times when the monitoring locations detailed in the Monitoring and Reporting Program are most likely affected by the discharge.

Monitoring requirements in the Ocean Plan that are relevant to the operation of the MPWSP also require an owner or operator to perform facility-specific monitoring to demonstrate compliance with the receiving water limitation for salinity (described above), and to evaluate the potential effects of the discharge within the water column, bottom sediments, and the benthic communities. Baseline biological conditions must be established at the discharge location as well as at a reference location outside the influence of the discharge prior to commencement of construction. To achieve this requirement, the owner or operator is required to conduct biological surveys (e.g.,

[20] At the time of publication of the April 2015 Draft EIR the Ocean Plan did not include a water quality objective for elevated salinity levels from operation of a desalination facility. As such, the analysis of salinity related water quality impacts was based on determining salinity increases at the edge of the ZID, as is done for other water quality constituents. Subsequent to the publication of the April 2015 Draft EIR, the Ocean Plan was amended to include a salinity standard, compliance with which is determined at the edge of the BMZ.

Before-After Control-Impact studies) that evaluate the differences between biological communities at a reference site and at the discharge location before and after the discharge commences. The pertinent regional water board uses the data and results from the surveys and any other applicable data for evaluating and renewing the requirements set forth in a facility's NPDES permit (in the case of the proposed project, the MRWPCA's outfall). Such monitoring is required to continue until the RWQCB and MBNMS determines that a regional monitoring program is adequate to ensure compliance with the receiving water limitation. The Monitoring and Reporting Plan would require review and approval by the RWQCB and MBNMS prior to implementation of the MPWSP, and would be revised if necessary, as part of the NPDES permit process. The MPWSP would be consistent with the Monitoring and Reporting Plan requirements of the Ocean Plan because such requirements form a part of the NPDES permit process and, further, CalAm would submit and, once approved by the RWQCB and MBNMS, execute a facility-specific Monitoring and Reporting Plan.

Thermal Plan

The *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California* (or Thermal Plan) adopted by the SWRCB in 1995 establishes temperature requirements for existing and new discharges in California coastal waters, interstate waters, enclosed bays, and estuaries. Water quality objectives for existing discharges into coastal waters require that wastes with elevated temperature comply with limitations necessary to assure protection of the beneficial uses and ASBSs (see also the discussion of the Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant [Order No. R3-2014-0013, NPDES Permit No. CA0048551], below, for discharges of treated wastewater from the Regional Wastewater Treatment Plant to Monterey Bay). The Thermal Plan defines new discharges as "discharges that are not presently taking place" and elevated-temperature wastes as "liquid, solid, or gaseous material including thermal waste[21] discharged at a temperature higher than the natural temperature of receiving water". The Thermal Plan establishes the following standards for all new discharges (SWRCB, 1995):

- The maximum temperature of thermal waste discharges shall not exceed the natural temperature of receiving waters by more than 20°F.
- The discharge of elevated temperature wastes shall not result in increases in the natural water temperature exceeding 4°F at the shoreline, the surface of any ocean substrate, or the ocean surface beyond 1,000 feet from the discharge system. The surface temperature limitation shall be maintained at least 50 percent of the duration of any complete tidal cycle.

During the non-irrigation season, the brine from the MPWSP Desalination Plant could be blended with treated wastewater from the MRWPCA's Regional Wastewater Treatment Plant, if available, prior to discharge via the MRWPCA outfall into Monterey Bay. The temperature requirements above are included in the MRWPCA's NPDES Permit (R3-2014-0013), discussed below, and would apply to brine-only discharges from the MPWSP Desalination Plant (during

[21] Cooling water and industrial process water used for the purpose of transporting waste heat.

periods when there is no wastewater available for blending), as well as combined discharges (when the brine would be blended with the treated wastewater). Operational discharges of the MPWSP would be consistent with the provisions of the thermal plan because MPWSP operational discharges would not operate in combination with a power plant or other operation requiring use of ocean waters for cooling for thermal control. As such, there would be no heating mechanism or any process that would increase the temperature of the source water as it passes through the treatment units.

Anti-Degradation Policy

The SWRCB Anti-Degradation Policy, formally known as the Statement of Policy with Respect to Maintaining High Quality Water in California (SWRCB Resolution No. 68-16), restricts degradation of surface and ground waters. Specifically, this policy protects water bodies where existing quality is higher than necessary for the protection of beneficial uses and requires that existing high quality be maintained to the maximum extent possible.

Under the Anti-Degradation Policy, any actions that can adversely affect water quality in all surface and ground waters must: (1) be consistent with maximum benefit to the people of California; (2) not unreasonably affect present and anticipated beneficial use of the water; and (3) not result in water quality less than that prescribed in water quality plans and policies. Furthermore, any actions that can adversely affect surface waters are also subject to the federal Anti-Degradation Policy (40 CFR Section 131.12) developed under the CWA. Operational discharges of the MPWSP would be consistent with the provisions of the SWRCB Anti-Degradation Policy because discharges from the proposed project that could affect surface water quality would be required to comply with the Anti-Degradation Policy, which is included as part of the NPDES permit requirements for point discharges (discussed below).

Nonpoint Source Pollution Control Program

In accordance with Section 319 of the Clean Water Act and Section 6217 of the CZARA of 1990, SWRCB and the California Coastal Commission jointly submitted the Plan for California's Nonpoint Source (NPS) Pollution Control Program to the USEPA and NOAA on February 4, 2000. The NPS Pollution Control Program provides a single unified, coordinated statewide approach to address nonpoint source pollution (USEPA, 2012). A total of 28 state agencies are working collaboratively through the Interagency Coordinating Committee to implement the NPS Pollution Control Program. California's Critical Coastal Areas (CCA) Program is a non-regulatory planning tool to foster collaboration among local stakeholders and government agencies, to better coordinate resources and focus efforts on coastal-zone watershed areas in critical need of protection from polluted runoff. A coastal area is designated as a CCA if it: has a 1998 303(d)-listed impaired coastal water body that flows into a Marine Managed Areas; flows into a Wildlife Refuge or Waterfront Park/Beach; flows into an Area of Special Biological Significance;[22] or was on the original 1995 CCA list, which is comprised of watersheds that flow into an 1994 303(d)-listed

[22] There are 34 ASBS ocean areas along the California coast monitored and maintained for water quality under the regulatory authority of the SWRCB.

impaired bay or estuary. The CCAs in the project area and vicinity include the Old Salinas River Estuary, Salinas River, Carmel Bay, Point Lobos, and Pacific Grove (CCC, 2012).

Central Coast Water Quality Control Plan (Basin Plan)

The *Water Quality Control Plan for the Central Coast* (or Basin Plan) prepared by the Central Coast RWQCB (2011b) identifies the designated beneficial uses of surface waters in the Central Coast region (see **Table 4.3-3**). The Basin Plan establishes quantitative and qualitative water quality objectives for protection of the beneficial uses, and establishes policies to guide the implementation of these water quality objectives. In addition to the water quality objectives in the Ocean Plan (see **Table 4.3-4**, above), the following objectives of the Basin Plan apply to all ocean waters, including Monterey Bay and Carmel Bay:

- **Dissolved Oxygen:** The mean annual dissolved oxygen concentration shall not be less than 7.0 mg/L, nor shall the minimum dissolved oxygen concentration be reduced below 5.0 mg/L at any time.
- **pH:** The pH value shall not be depressed below 7.0, nor raised above 8.5.
- **Radioactivity:** Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life; or result in the accumulation of radionuclides in the food web to an extent which presents a hazard to human, plant, animal, or aquatic life.

The water quality objectives are incorporated in the individual NPDES permits. For example, the MRWPCA's NPDES Permit No. CA0048551 (Order No. R3-2014-0013) for discharges of treated wastewater from the Regional Wastewater Treatment Plant to Monterey Bay would be amended to include the brine discharge resulting from the proposed project.

NPDES Waste Discharge Program

In California, administration of the NPDES program has been delegated by the US EPA to the State Board. Through the RWQCBs, point source dischargers are required to obtain NPDES permits (or, in California under authority of Porter-Cologne, Waste Discharge Requirements). Point sources include municipal and industrial wastewater facilities and stormwater discharges. There are two types of NPDES permits: individual permits tailored to an individual facility and general permits that cover multiple facilities within a specific category. Effluent limitations serve as the primary mechanism in NPDES permits for controlling discharges of pollutants to receiving waters. When developing effluent limitations for an NPDES permit, a permit applicant must consider limits based on both the technology available to control the pollutants (i.e., technology-based effluent limits) and limits that are protective of the water quality standards of the receiving water (i.e., water quality-based effluent limits if technology-based limits are not sufficient to protect the water body). For inland surface waters and enclosed bays and estuaries, the water-quality-based effluent limitations are based on criteria in the National Toxics Rule and the California Toxics Rule, and objectives and beneficial uses in the Basin Plan. For ocean discharges, the Ocean Plan contains beneficial uses, water quality objectives, and effluent limitations (described in detail above). NPDES permits for discharges into Monterey Bay must be authorized by MBNMS.

NPDES Construction General Permit

The State of California adopted a revised Construction General Permit on September 2, 2009 (Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ and 2012-0006-DWQ) (General Construction NPDES Permit). The General Construction NPDES Permit regulates construction site storm water management. Dischargers whose projects disturb one or more acres of soil, or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the general permit for discharges of stormwater associated with construction activity. The proposed project would be required to comply with the permit requirements to control stormwater discharges from the construction sites. Construction activity subject to this permit includes clearing, grading, and disturbances to the ground, such as stockpiling or excavation, as well as construction of buildings and linear underground projects (LUP), including installation of water pipelines and other utility lines. Portions of the proposed project would fall under the Type 1 LUP category if the following conditions are met:

a) Construction occurs on unpaved improved roads, including their shoulders or land adjacent to them;

b) The areas disturbed during a single construction day are returned to their preconstruction condition, or to an equivalent condition (i.e., disturbed soils such as those from trench excavation are hauled away, backfilled into the trench, and/or placed in spoils piles and covered with plastic), at the end of that same day;

c) Vegetated areas disturbed by construction activities are stabilized and revegetated at the end of the construction period; and

d) When required, adequate temporary soil stabilization best management practices (BMPs) are installed and maintained until vegetation has reestablished to meet the permit's minimum cover requirements for final stabilization.

In the project area, the Construction General Permit is implemented and enforced by the Central Coast RWQCB, which administers the stormwater permitting program. To obtain coverage under this permit, project operators must electronically file Permit Registration Documents, which include a Notice of Intent, a Stormwater Pollution Prevention Plan (SWPPP), and other compliance-related documents. An appropriate permit fee must also be mailed to SWRCB. The SWPPP identifies BMPs that must be implemented to reduce construction effects on receiving water quality based on potential pollutants. The BMPs identified are directed at implementing both sediment and erosion control measures and other measures to control potential chemical contaminants. In addition, the SWPPP is required to contain a visual monitoring program and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment. Examples of typical construction BMPs include scheduling or limiting certain activities to dry periods, installing sediment barriers such as silt fence and fiber rolls, and maintaining equipment and vehicles used for construction. Non-stormwater management measures include installing specific discharge controls during certain activities, such as paving operations, vehicle and equipment washing and fueling. The SWPPP also includes descriptions of the BMPs to reduce pollutants in stormwater discharges after all construction phases have been completed at the site (post-construction BMPs). Dischargers are responsible for notifying the RWQCB of violations or incidents of non-compliance, as well as for submitting annual reports identifying deficiencies of the BMPs and how the deficiencies were corrected.

The Construction General permit includes several new requirements (as compared to the previous Construction General Permit, 99-08-DWQ), including risk-level assessment for construction sites, an active storm water effluent monitoring and reporting program during construction (for Risk Level II and III sites), rain event action plans for certain higher risk sites, and numeric effluent limitations (NELs) for pH and turbidity as well as requirements for qualified professionals that prepare and implement the plan. The risk assessment and SWPPP must be prepared by a state-qualified SWPPP Developer and implementation of the SWPPP must be overseen by a state-qualified SWPPP Practitioner.

RWQCB Dewatering Requirements

NPDES General Permit for Discharges with Low Threat to Water Quality

Construction of the proposed facilities would require excavation and trenching activities. Such activities in areas with shallow groundwater or that are located adjacent to surface water bodies could require dewatering to create a dry area. Discharges of dewatering effluent to the local stormwater drainage system or to vegetated upland areas are conditionally exempt provided they meet the water quality criteria in the General Waste Discharge Requirements (General WDRs). The RWQCB requires that the dewatering effluent be tested for possible pollutants; the analytical constituents for these tests are generally determined based on the source of the water, the land use history of the construction site, and the potential for the effluent to impact the quality of the receiving water body.

The *General WDRs NPDES General Permit for Discharges with Low Threat to Water Quality* (Order No. R3-2011-0223, NPDES No. CAG993001) (RWQCB, 2011a) applies to low-threat discharges, which are defined as discharges containing minimal amounts of pollutants and posing little or no threat to water quality and the environment. Discharges that meet the following criteria are covered under this permit:

a) Pollutant concentrations in the discharge do not: (1) cause, (2) have a reasonable potential to cause, or (3) contribute to an excursion above any applicable water quality objectives, including prohibitions of discharge;

b) The discharge does not include water added for the purpose of diluting pollutant concentrations;

c) Pollutant concentrations in the discharge will not cause or contribute to degradation of water quality or impair beneficial uses of receiving waters;

d) Pollutant concentrations in the discharge do not exceed the limits in the permit unless the Executive Officer determines that the applicable water quality control plan (i.e., Ocean Plan and/or State Implementation Policy) does not require effluent limits;

e) The discharge does not cause acute or chronic toxicity in receiving waters; and

f) The discharger demonstrates the ability to comply with the requirements of this General Permit.

The project-related discharges that could fall under the General WDRs include: discharges of dewatering effluent; water produced from one-time draining of existing pipelines to construct new connections; and disinfection water from these same existing pipelines and newly constructed pipelines before being put into service, all of which could be discharged to vegetated upland areas or to the local stormwater drainage system. These discharges may be treated and discharged on a continuous or a batch basis. For discharges from construction sites smaller than one acre that are part of a larger common plan of development or that may cause significant water quality impacts, the discharge may require coverage under the construction stormwater permit or an individual NPDES permit.

Waiver of Waste Discharge Requirements

California Water Code Section 13269 authorizes the Central Coast RWQCB to waive WDRs for specific discharges or specific types of discharges where such a waiver is consistent with any applicable state or regional water quality control plan and is in the public interest. The *General Waiver of WDRs for Specific Types of Discharges* (Resolution R3-2014-0041) (General Waiver) (RWQCB, 2014) contains specific conditions for the specific discharges and is consistent with the Central Coast Basin Plan. Waivers may be granted for discharges to land and may not be granted for discharges to surface waters or conveyances there to that are subject to the federal CWA requirements for NPDES permits.

Under the MPWSP, drilling fluids, such as water, bentonite mud, or environmentally inert biodegradable additives, would be used for well construction. The threat to water quality of such materials depends primarily on the additives used. If the drilling fluids are free of appreciable additives (additive quantities in conformance with industry standards), the used slurry may be spread on pastures or fields, provided that contact with surface water is avoided and runoff is prevented (RWQCB, 2014). The muds and clay slurry generated during the drilling and development of the subsurface slant wells and the proposed ASR-5 and ASR-6 Wells in the Fitch Park military housing area would fall under the category of “Water Supply Well Drilling Muds” in the General Waiver.

The water extracted during well development falls under the category of “water supply discharges” in the General Waiver (RWQCB, 2014). Water supply discharges that would occur under the proposed project include all water produced during drilling and development of the subsurface slant wells and ASR-5 and ASR-6 Wells. Under the General Waiver, these discharges would be waived from WDRs and from the requirement of submitting a waste discharge report; however, they would be subject to the following conditions (RWQCB, 2014).

Water Supply Well Drilling Muds:

a) The discharge shall be spread off-site on Army property over an undisturbed, vegetated area capable of absorbing the top-hole water and filtering solids in the discharge, and spread in a manner that prevents a direct discharge to surface waters.

b) The pH of the discharge shall be between 6.5 and 8.3.

c) The discharge shall not contain oil or grease[23].

d) The discharge area shall not be within 100 feet of a stream, body of water, or wetland, nor within streamside riparian corridors.

Water Supply Discharges:

a) The discharger shall implement appropriate management practices to dissipate energy and prevent erosion.

b) The discharger shall implement appropriate management practices to preclude discharge to surface waters and surface water drainage courses. The discharger shall immediately notify the Central Coast RWQCB staff of any discharge to surface waters or surface water drainage courses.

c) The discharge shall not have chlorine or bromine concentrations that could impact groundwater quality.

d) The discharge area shall not be located within 100 feet of a stream, body of water, or wetland, nor within streamside riparian corridors.

However, the MPWSP would not be inconsistent with such requirements as all drilling fluids would be recirculated into and out of the borings using a mud tank located next to the drill rig. Drill cuttings would be removed from the drilling mud using a shaker table and then the drilling mud would be re-used. Once the drill bit reaches groundwater, the construction contractor would pump out all of the drilling fluid slurry and put it in a storage container for offsite hauling and disposal.

NPDES Municipal Stormwater Permit

The NPDES General Permit for (WDRs for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) (Order No. 2013-0001-DWQ, NPDES No. CAS000004) regulates stormwater discharges from small Municipal Separate Storm Sewer Systems (MS4) into waters of the U.S. (SWRCB, 2013b). An “MS4” is defined as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains): (i) designed or used for collecting or conveying stormwater; (ii) which is not a combined sewer; and (iii) which is not part of a Publicly Owned Treatment Works as defined at Title 40 of the Code of Federal Regulations (CFR) Section 122.2 (MRSWMP, 2011).

The Phase II Municipal General Permit requires regulated small MS4s to develop and implement BMPs, measurable goals, and timetables for implementation, designed to reduce the discharge of pollutants to the maximum extent practicable and to protect water quality.[24] The permittees under

[23] Oil and grease includes hydraulic fluids.
[24] Phase I stormwater permits provide permit coverage for medium (serving between 100,000 and 250,000 people) and large (serving 250,000 people) municipalities.

the small MS4 (Phase II) General Permit[25] in the project area include Monterey County and cities therein. Additionally, the Presidio of Monterey is a Phase II non-traditional MS4 permittee with requirements applicable within the Ord Military Community in Seaside. Each permittee is required to prepare and implement a stormwater management plan (SWMP) and regulate stormwater runoff from development and redevelopment projects through post-construction stormwater management requirements (RWQCB, 2013).

Several of the proposed facilities such as the subsurface slant wells at CEMEX, the MPWSP Desalination Plant in unincorporated Monterey County, and the ASR-5 and ASR-6 Wells and ASR Conveyance Pipelines in the Presidio of Monterey – Ord Military Community in Seaside would be subject to the stormwater control requirements in the respective local jurisdictions.

A Memorandum of Agreement for the Monterey Regional Stormwater Pollution Prevention Program was prepared and executed by MRWPCA and by the entities in the southern Monterey Bay area (Monterey County and cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside) to form the Monterey Regional Stormwater Management Program (MRSWMP). MRWPCA acts as the administrative agent for the MRSWMP. The purpose of the MRSWMP is to implement and enforce a series of BMPs to reduce the discharge of pollutants from the MS4s to the “maximum extent practicable,” to protect water quality, and to satisfy the appropriate water quality requirements of the CWA (City of Monterey, 2011). The Phase II Program contains six Minimum Control Measures (MRSWMP, 2011):

- Public Education and Outreach;
- Public Participation/Involvement;
- Illicit Discharge Detection and Elimination;
- Construction Site Runoff Control;
- Post-Construction Runoff Control; and
- Pollution Prevention/Good Housekeeping.

The MRSWMP lists BMPs and associated Measurable Goals for the six Minimum Control Measures. The Measurable Goals must include, as appropriate, the months and years for scheduled actions, including interim milestones and frequency of the action. It is through the implementation and evaluation of these BMPs and Measurable Goals that the permittees ensure that the objectives of the Phase II NPDES Program are met (MRSWMP, 2011).

In July 2013, the Central Coast RWQCB adopted Resolution No. R3-2013-0032, which prescribes new Post-Construction Requirements for projects that create or replace 2,500 square feet or more of impervious area and receive their first discretionary approval for design elements after March 6, 2014. **Table 4.3-6** summarizes the new post-construction requirements for different categories of projects, which would include the MPWSP.

[25] Phase II stormwater permits provide permit coverage for smaller municipalities (populations less than 100,000), including non-traditional Small MS4s, which are facilities such as military bases, public campuses, prisons, and hospital complexes.

TABLE 4.3-6
OVERVIEW OF POST-CONSTRUCTION REQUIREMENTS FOR STORMWATER MANAGEMENT

Project Categories	Performance Requirements
Tier 1 Projects Projects that create or replace 2,500 square feet or more of impervious surface.	**Implement One or More Low Impact Design (LID) Measures:** Limit disturbance of natural drainage features. Limit clearing, grading, and soil compaction. Minimize impervious surfaces. Minimize runoff by dispersing runoff to landscape or using permeable pavements.
Tier 2 Projects Projects that create or replace 5,000 square feet or more net impervious surface.	**Tier 1 requirements, plus treat site runoff:** Treat runoff generated by the 85th percentile 24-hour storm event with an approved and appropriately sized LID treatment system prior to discharge from the site.
Tier 3 Projects Projects that create or replace 15,000 square feet or more of impervious surface.	**Tier 2 requirements, plus:** Prevent offsite discharge from events up to the 95th percentile rainfall event using Stormwater Control Measures.
Tier 4 Projects Projects that create or replace 22,500 square feet of impervious surface.	**Tier 3 requirements, plus:** Control peak flows to not exceed pre-project flows for the 2-year through 10-year events.

SOURCE: MRSWMP, 2014.

NPDES Permit for MRWPCA Regional Wastewater Treatment Plant

MRWPCA provides wastewater treatment, disposal, and reclamation services for the cities of Monterey, Pacific Grove, Del Rey Oaks, Sand City, Marina, and Salinas; the Seaside Sanitation District; Castroville, Moss Landing, and Boronda Community Service Districts; and the former Fort Ord military base. Residential, commercial, and industrial wastewater is conveyed to the MRWPCA Regional Wastewater Treatment Plant in Monterey County located 2 miles north of Marina. The MRWPCA Regional Wastewater Treatment Plant has an average dry weather design treatment capacity of 29.6 million gallons per day (mgd) and peak wet weather design capacity of 75.6 mgd (RWQCB, 2014).

In winter months, secondary treated wastewater from the MRWPCA Regional Wastewater Treatment Plant is discharged to Monterey Bay through a diffuser positioned 11,260 feet offshore at a depth of approximately 100 feet. The diffuser is designed to convey ultimate wet weather flows of 81.2 mgd, which is the permitted rate of discharge through the outfall. The treated wastewater discharge is regulated by the RWQCB (2014) under the *Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant* (Order No. R3-2014-0013, NPDES Permit No. CA0048551). The minimum initial dilution (Dm) established in the NPDES permit at the point of discharge for operations by the MRWPCA is 1:145 (parts effluent to seawater). The Dm is used by the RWQCB to determine compliance with the water quality effluent limitations established in the NPDES permit for in-pipe water quality (i.e., prior to discharge) that are based on water quality objectives contained in the Ocean Plan.

The effluent limitations in the permit are based on and are consistent with the water quality objectives contained in the Ocean Plan.

In the summer months, up to 29.6 mgd of the secondary treated wastewater from the Regional Wastewater Treatment Plant is conveyed to the Salinas Valley Reclamation Project (SVRP) recycled water plant, where it is tertiary treated[26] and subsequently used for irrigation of 12,000 acres of farmland in the northern Salinas Valley. This reclaimed water is distributed to farmland via the Castroville Seawater Intrusion Project (CSIP) distribution system. The SVRP and CSIP reduce the region's dependence on local groundwater, thereby controlling saltwater intrusion.

The NDPES permit incorporates the Ocean Plan water quality objectives established by the SWRCB in order to ensure the protection of the beneficial uses of Monterey Bay. An amendment to the MRWPCA NPDES Permit to include discharges of brine would be required prior to the implementation of the MPWSP and operation of the MPWSP Desalination Plant. The amendment process for the NPDES Permit would require an extensive water quality assessment, which would involve MRWPCA (as the discharger defined in the current NPDES Permit) and/or CalAm (as a contributor of a new discharge) to perform testing and monitoring of the water quality of the discharges, including the testing of the source water drawn from the subsurface water intake wells and piped to the MPWSP Desalination Plant and assessing the resulting water quality of the discharges from the MPWSP Desalination Plant. Any discharge from the operation of the MPWSP Desalination Plant to Monterey Bay through the MRWPCA outfall would be subject to the Amended NPDES Permit.

As per Section 2c of the NPDES Permit, "prior to increasing the volume of brine waste discharged through the ocean outfall beyond 375,000 gallons average daily flow, the Discharger [i.e., MRWPCA] shall submit a brine waste disposal study to the Executive Officer for approval. The study shall include, at a minimum, the following elements: (1) a projection of the brine volume and characteristics, (2) an assessment of the impact of the increased brine volume on permit compliance, (3) an assessment of the impact of the increased brine volume on the minimum probable initial dilution at the point of discharge, (4) a detailed description of the brine waste disposal facilities which are proposed to accommodate the increased brine volume and facilitate blended secondary effluent and brine wastes flow metering and sampling, and (5) a schedule for the design and construction of the new brine disposal facilities."

Section VII B.1 of the NPDES Permit includes the "Reopener Provisions" which state that the [NPDES Permit] Order may be modified in accordance with the requirements set forth at 40 C.F.R. parts 122 and 124, to include appropriate conditions or limits based on newly available information, or to implement any, new State water quality objectives that are approved by the USEPA. As effluent is further characterized through additional monitoring, and if a need for

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[26] Tertiary treatment is an advanced level of treatment provided to secondary treated wastewater prior to use for irrigation under Title 22 regulations.

additional effluent limitations becomes apparent after additional effluent characterization, the Order will be reopened to incorporate such limitations."

Further, the NPDES Permit accounts for a potential exceedance of any constituent over the effluent limitation. "An existing effluent limitation for the pollutant shall remain in the permit, otherwise the permit shall include a reopener clause to allow for subsequent modification of the permit to include an effluent limitation if the monitoring establishes that the discharge causes, has the reasonable potential to cause, or contribute to an excursion above a Table 1 water quality objective" (RWQCB, 2014).

4.3.2.3 Applicable Regional and Local Land Use Plans and Policies

Table 4.3-7 presents the regional and local land use plans, policies, and regulations pertaining to surface water hydrology and water quality that are relevant to the MPWSP and that were adopted for the purpose of avoiding or mitigating an environmental effect. Project consistency with such plans, policies, and regulations is also indicated in the table. Where the analysis concludes the proposed project would be consistent with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes the proposed project would be potentially inconsistent with the applicable plan, policy, or regulation, the reader is referred to Section 4.3.5 Direct and Indirect Effects of the Proposed Project, for additional discussion. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

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TABLE 4.3-7
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.125:*** Approval of all future uses and construction within the Marina Planning Area shall be contingent upon compliance with the following policies and conditions intended to protect the quality of the area's water resources, avoid unnecessary consumption of water, and ensure that adequate water resources are available for new development.	This policy is intended to protect water quality, minimize unnecessary consumption, and provide for future resource needs.	Consistent: The project would be constructed in conformance with the State Construction General Permit and WDRs, which require specific construction-related BMPs to prevent concentrated stormwater run-on/runoff, soil erosion, and release of construction site contaminants. The project would be operated in conformance with State WDRs under the NPDES Phase II Permit (Order No. 2013-0001-DWQ, NPDES No. CAS000004), which regulates stormwater discharge into storm sewer systems. Mandatory compliance with these permits would protect water quality during construction and operation. The project would not increase water consumption and would develop supplemental water supplies for the Monterey Peninsula.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Storm Drainage	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 3.57 (1):*** All storm water runoff shall continue to be retained onsite and accommodated by localized retention basins. Retention basins associated with a particular project shall be landscaped with appropriate plant materials and shall be designed wherever possible as integral parts of a development project's common open space or parks, or to create new or enhance existing habitat. All onsite drainage facilities shall be designed to convey runoff from a 10-year frequency storm at minimum. In areas of the City where recycled water will not be readily available, the City encourages the provision of storm water reuse facilities of sufficient size to provide for landscape irrigation of development in proximity to retention basins. The adequacy of onsite and offsite drainage facilities shall be determined through the preparation of storm drainage reports and plans, approved by the City Public Works Director; such reports and plans shall be required for all new subdivisions and new commercial/industrial development proposed in Marina.	This policy is intended to minimize adverse effects of uncontrolled stormwater runoff.	Consistent: The project would conform to the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ, NPDES No. CAS000004) which require specific BMPs and measures to manage stormwater. The project would be subject to MRSWMP, which requires stormwater control requirements under the MS4 permit and implementation of erosion and stormwater control measures. The State requirements are incorporated in the municipal stormwater permit.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Storm Drainage	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 3.57 (2):*** Pretreatment of stormwater runoff from roads, large parking areas, and other extensive paved areas used by vehicles shall be provided using appropriate means such as primary settlement structures, routing through settlement ponds, or routing through adequately long natural swales or slopes. In addition, all development plans shall conform to the requirements of the City's National Pollution Discharge Elimination System permit and City ordinances, and all subdivisions and new commercial/industrial development shall identify Best City of Marina General Plan 74 Management Practices (BMP's) appropriate or applicable to uses conducted onsite to effectively prevent the discharge of pollutants in stormwater runoff. 3. Stormwater systems shall be constructed in a manner which prevents soil erosion. Appropriate measures to avoid such impacts include the dispersal of runoff, installation of energy dissipaters where dispersal is not practical and concentration of runoff water is necessary, and retention of vegetation or revegetation of affected surfaces.	This policy is intended to minimize adverse effects of uncontrolled stormwater runoff.	Consistent: The project would conform to the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ, NPDES No. CAS000004) which require specific BMPs and measures to manage stormwater. The State requirements are incorporated in the municipal stormwater permit. The project would be subject to the MRSWMP requirements under the MS4 permit and would be required to implement erosion and stormwater control measures.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone and inland areas)	Marina Municipal Code	Chapter 15.48 – Flood Damage Prevention	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Chapter 15.48 - Flood Damage Prevention*** states provisions for flood prevention and reduction of flood hazards. A special flood hazard area is an area that is subject to one percent or greater change of flooding in a given year, which is the FEMA 100-year floodplain. The code also sets requirements for new storm drainage facilities.	This section is intended to prevent and reduce damage from floods.	<u>Consistent:</u> Within the city of Marina, portions of the Source Water Pipeline and new Transmission Main would be constructed in a 100-year flood hazard area. However, these underground pipelines would not impede or redirect flood flows. None of the aboveground facilities in the city of Marina would be located in the 100-year floodplain.
City of Marina (coastal zone and inland areas)	Marina Municipal Code	Chapter 16.08 – Design Requirement by Type of Subdivision	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main Pipeline	***Section 16.08.080 (F) Erosion Control.*** [Implement] silt basins, structures, planting or other forms of erosion control when necessary in the opinion of the Planning Commission.	This section is intended to control erosion.	<u>Consistent:</u> The project conforms to the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ, NPDES No. CAS000004) which require specific BMPs and measures to manage stormwater and control erosion. The State requirements are incorporated in the municipal stormwater permit. The project would be subject to the MRSWMP, which requires stormwater control requirements under the MS4 permit and implementation of erosion control measures.
City of Marina (coastal zone & inland area)	Marina Municipal Code	Title 8 - Health and Safety	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Section 8.46.130 Requirement to prevent, control, and reduce storm water pollutants (b) Responsibility to Implement Best Management Practices.*** Notwithstanding the presence or absence of BMP requirements promulgated pursuant to subparagraphs (a), (b), (c), and (d) of this section, each person engaged in activities or operations, or owning facilities or property which will or may result in pollutants entering storm water, the storm drain system, or waters of the U.S. shall implement best management practices to the extent they are technologically achievable to prevent and reduce such pollutants. The owner or operator of each commercial or industrial establishment shall provide reasonable protection from accidental discharge of prohibited materials or other wastes into the city storm drain system and/or watercourses. Facilities to prevent accidental discharge of prohibited materials or other wastes shall be provided and maintained at expense of the owner or operator.	This section is intended to protect water quality by preventing, controlling, and reducing pollutants (including sediment) from entering stormwater, the storm drain system, and waters of the U.S.	<u>Consistent:</u> The project would conform to the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ, NPDES No. CAS000004) that require specific BMPs and measures to manage stormwater. The State requirements are incorporated in the municipal stormwater permit. The project would be subject to the MRSWMP, which requires stormwater control requirements under the MS4 permit and implementation of erosion and stormwater control measures to protect water quality.
City of Marina (coastal zone & inland area)	Marina Municipal Code	Title 8 - Health and Safety	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Section 8.46.130 Requirement to prevent, control, and reduce storm water pollutants (c) Construction Sites.*** The city's BMP Guidance Series will include appropriate best management practices to reduce pollutants in any storm water runoff from construction activities. The city shall incorporate such requirements in any land use entitlement and construction or building-related permit to be issued relative to such development or redevelopment. The owner and developer shall comply with the terms, provisions, and conditions of such land use entitlements and building permits as required in this chapter and the city storm water utility ordinance. Construction activities subject to BMP requirements shall continuously employ measures to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts on water quality, contamination, or unauthorized discharge of pollutants.	This section is intended to protect water quality by preventing, controlling, and reducing pollutants (including sediment) from entering stormwater, the storm drain system, and waters of the U.S.	<u>Consistent:</u> The project would conform to the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ, NPDES No. CAS000004) that require specific BMPs and measures to manage stormwater. The proposed project would be subject to the MRSWMP, which requires stormwater control requirements under the MS4 permit and implementation of erosion and water quality control measures.
City of Marina (coastal zone)	Marina Local Coastal Program Land Use Plan	Policy	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	**Policy 17.** To insure protection and restoration of ocean's water quality and biological productivity.	This policy is intended to protect ocean water quality and biological productivity.	<u>Consistent:</u> The project would conform to the State Construction General Permit and WDRs (the NPDES Phase II Permit, Order No. 2013-0001-DWQ, NPDES No. CAS000004), which require i specific construction-related BMPs to prevent concentrated stormwater run-on/runoff, soil erosion, and release of construction site contaminants to protect water quality.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Monterey (inland area)	Monterey City Code	Chapter 31.5 - Storm Water Management	Ryan Ranch–Bishop Interconnection Improvements	***Section 31.5-12. Prohibitions of Illegal Discharges.*** No person or entity shall discharge or cause to be discharged into the municipal Storm Drain System or waters of the state, any materials, including but not limited to Pollutants or waters containing any Pollutants that cause or contribute to a violation of applicable water quality standards, other than storm water.	This section is intended to prevent discharges into the municipal Storm Drain System or waters of the state that could affect water quality.	<u>Consistent:</u> The project would conform to the State Construction General Permit and the Chapter 31.5 of the City Code, which require specific construction-related BMPs to prevent erosion and the release of contaminants to protect water quality.
City of Monterey (inland area)	Monterey City Code	Chapter 31.5 - Storm Water Management	Ryan Ranch–Bishop Interconnection Improvements	***Section 31.5-12. Requirement to Prevent, Control, and Reduce Storm Water Pollutants***. (c) Construction Sites. BMPs to reduce pollutants in any storm water runoff activities shall be incorporated in any land use entitlement and/or construction or building-related permit. The owner and developer shall comply with the terms, provisions, and conditions of such land use entitlements and/or building permits as required by the City and as required by the NPDES General Permit and as amended thereto.	This section is intended to prevent pollutants (including sediment) from entering stormwater runoff.	<u>Consistent:</u> The project would conform to the State Construction General Permit and the Chapter 31.5 of the City Code, which require specific construction-related BMPs to prevent erosion and the release of contaminants.
City of Monterey (inland areas)	Monterey City Code	Chapter 31.5 – Storm Water Management	Ryan Ranch-Bishop Interconnection Improvements	***Section 31.5-15 - Requirement to Prevent, Control, and Reduce Storm Water Pollutants. (b) New Development and Redevelopment.*** The City may require any owner or person developing real property to identify appropriate BMPs to control the volume, rate, and potential pollutant load of stormwater runoff from new development and redevelopment projects as may be appropriate to minimize the generation, transport and discharge of pollutants. The City shall incorporate such requirements in any land use entitlement and construction or building-related permit to be issued relative to such development or redevelopment. The owner and developer shall comply with the terms, provisions, and conditions of such land use entitlements and building permits as required in this Article and the City Stormwater Utility Ordinance, Chapter 31.5, Article 1. The requirements may also include a combination of structural and non-structural BMPs along with their long-term operation and maintenance.	This section is intended to protect stormwater quality from pollutants associated with new development.	<u>Consistent:</u> Within the city of Monterey, the project would conform to the State Construction General Permit and WDRs, which require BMPs and measures to prevent water pollution and control any pollutant discharge so as to protect water quality.
City of Monterey (inland areas)	Monterey City Code	Chapter 9 – Building Regulations	Ryan Ranch-Bishop Interconnection Improvements	***Section 9-70.1- Establishment of Development Permit.*** A Development Permit shall be obtained before construction or development begins within any area of special flood hazards established in Section 9-69. Application for a Development Permit shall be made on forms furnished by the Floodplain Administrator and may include, but not be limited to plans prepared by a registered civil engineer in duplicate drawn to scale showing the nature, location, dimensions, and elevation of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities; along with their locations.	This section is intended to protect people and property from flood hazards.	<u>Consistent:</u> No new habitable development or redevelopment is proposed under the MPWSP within the city of Monterey.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Conservation/ Open Space	New Transmission Main, ASR Conveyance Pipeline, ASR Pump to Waste Pipeline, and ASR Recirculation Pipeline	***Policy COS.3-2:*** Work with all local, regional, State, and federal agencies to implement mandated water quality programs and regulations to improve surface water quality. *Implementation Plan COS-3.2.1: NPDES Requirements:* To reduce pollutants in urban runoff, require new development projects and substantial rehabilitation projects to incorporate Best Management Practices (BMPs) pursuant to the National Pollutant Discharge Elimination System (NPDES) permit to ensure that the City complies with applicable state and federal regulations.	This policy is intended to protect surface water quality from pollutants (including sediment) in urban runoff.	<u>Consistent:</u> The pipelines would be constructed below grade and would not increase the amount of impervious surfaces, or release pollutants. In addition, the project would conform to the State Construction General Permit and the Seaside Municipal Code, which require specific construction-related BMPs to prevent stormwater pollutants from leaving the construction sites. Once installed, the proposed pipelines would have no effect on stormwater quality or runoff.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Conservation/ Open Space	New Transmission Main, ASR Conveyance Pipeline, ASR Pump to Waste Pipeline, and ASR Recirculation Pipeline	***Policy COS-4.2*:** Protect and enhance the creeks, lakes, and adjacent wetlands for their value in providing visual amenity, habitat for wildlife, and recreational opportunities.	This policy is intended to protect beneficial uses of creeks, lakes, and adjacent wetlands.	<u>Consistent:</u> The project would conform to State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ), which require BMPs and measures to control and minimize any stormwater runoff and prevent water pollution so as to protect water quality. The project would conform with State WDRs under the NPDES Phase II Permit (Order No. 2013-0001-DWQ, NPDES No. CAS000004), which regulates stormwater discharge into storm sewer systems. For impacts related to wetlands, please refer to Section 4.6, Terrestrial Biological Resources. As discussed for wetlands in Section 4.6, Terrestrial Biological Resources, for wetlands, the project would have a less than a significant impact with mitigation.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Safety	New Transmission Main, ASR Conveyance Pipeline, ASR Pump to Waste Pipeline, and ASR Recirculation Pipeline	***Policy S-1.2*:** Protect the community from flooding hazards. *Implementation Plan S-1.2.1*: Project Flood Control. Require developers to provide flood control systems in new development areas that mitigate potential onsite flooding hazards and also avoid increasing flood hazards elsewhere.	This policy is intended to protect people and property from flood hazards.	<u>Consistent:</u> None of the MPWSP components proposed for Seaside would be located in a flood hazard area. All MPWSP facilities in Seaside would be buried below ground surface and would not present a risk of flood hazard.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Land Use	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline	***Policy LU-8.2:*** Ensure that developers provide stormwater retention/detention facilities and institute Best Management Practices that regulate runoff and siltation that meets local, State, and federal standards.	This policy is intended to ensure that developers provide stormwater retention/detention facilities.	<u>Consistent:</u> None of the MPWSP components proposed for Seaside would be located in a flood hazard area. All MPWSP facilities in Seaside would be buried below ground surface and would not present a risk of flood hazard.
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 8.46 – Urban Storm Water Quality Manage Surface management and Discharge Control	New Transmission Main, ASR Conveyance Pipeline, ASR Pump to Waste Pipeline, and ASR Recirculation Pipeline	***Chapter 8.46 Urban Storm Water Quality Manage Surface Management and Discharge Control.*** Urban Stormwater Quality Management and Discharge Control would apply to all water entering the storm drain system generated on any developed and undeveloped lands lying within the city. The chapter lists requirements to prevent, control, and reduce stormwater pollutants, protection of water courses, and notification to emergency response officials in the event of a chemical release.	This guideline is intended to manage stormwater quality and control stormwater discharges.	<u>Consistent:</u> The proposed project would be constructed and operated in conformance with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ, NPDES No. CAS000004 and Order No. R3-2014-0013), which require implementation of BMPs and measures to control and minimize stormwater discharges into nearby water bodies. The State requirements are incorporated in the local municipal code and the municipal stormwater permit.
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 8.46 - Health and Safety	New Transmission Main ASR Conveyance Pipeline, ASR Pump to Waste Pipeline, and ASR Recirculation Pipeline	***Section 8.46.130 Requirement to prevent, control, and reduce storm water pollutants (B) Responsibility to Implement Best Management Practices***. Notwithstanding the presence or absence of BMP requirements promulgated pursuant to subparagraphs A, B, C, and D of this section, each person engaged in activities or operations, or owning facilities or property which will or may result in pollutants entering storm water, the storm drain system, or waters of the U.S. shall implement best management practices to the extent they are technologically achievable to prevent and reduce such pollutants. The owner or operator of each commercial or industrial establishment shall provide reasonable protection from accidental discharge of prohibited materials or other wastes into the city storm drain system and/or watercourses. Facilities to prevent accidental discharge of prohibited materials or other wastes shall be provided and maintained at expense of the owner or operator.	This section is intended to protect surface water quality from pollutants (including sediment) associated with development.	<u>Consistent:</u> The pipelines would be constructed below grade and would not increase the amount of impervious surfaces, or releasing pollutants. In addition, the proposed project would be subject to the State Construction General Permit, and the Seaside Municipal Code, which require the implementation of specific construction-related BMPs to prevent stormwater pollutants from leaving the construction sites.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 8.46 - Health and Safety	New Transmission Main, ASR Conveyance Pipeline, ASR Pump to Waste Pipeline, and ASR Recirculation Pipeline	***Section 8.46.130 Requirement to prevent, control, and reduce storm water pollutants (C) Construction Sites***. The city's BMP Guidance Series includes appropriate best management practices to reduce pollutants in any storm water runoff from construction activities. The city shall incorporate such requirements in any land use entitlement and construction or building-related permit to be issued relative to such development or redevelopment. The owner and developer shall comply with the terms, provisions, and conditions of such land use entitlements and building permits as required in this chapter and the city storm water utility ordinance. Construction activities subject to BMP requirements shall continuously employ measures to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts on water quality, contamination, or unauthorized discharge of pollutants.	This section is intended to protect surface water quality from pollutants (including sediment) associated with development.	<u>Consistent:</u> The pipelines would be constructed below grade and would not increase the amount of impervious surfaces, or release pollutants. In addition, the proposed project would be subject to the State Construction General Permit and Seaside Municipal Code, which require the implementation of specific construction-related BMPs to prevent stormwater pollutants from leaving the construction sites.
County of Monterey (inland areas)	Carmel Valley Master Plan	Natural Resources	Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements	***Policy CV-1.20:*** Design ("D") and site control ("S") overlay district designations shall be applied to the Carmel Valley area. Design review for all new development throughout the Valley, including proposals for existing lots of record, utilities, heavy commercial, and visitor accommodations, but excluding minor additions to existing development where those changes are not conspicuous from outside of the property, shall consider the following guidelines: f. Minimize erosion and/or modification of landforms.	This policy is intended to minimize erosion.	<u>Consistent:</u> The proposed project would be constructed and operated in conformance with State Construction General Permit, which requires implementation of BMPs and measures to control and minimize erosion.
County of Monterey (inland areas)	Carmel Valley Master Plan	Natural Resources	Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements	***Policy CV-4.1:*** In order to reduce potential erosion or rapid runoff: a. The amount of land cleared at any one time shall be limited to the area that can be developed during one construction season. b. Motorized vehicles shall be prohibited on the banks or in the bed of the Carmel River, except by permit from the Water Management District or Monterey County. c. Native vegetative cover must be maintained on areas that have the following combination of soils and slope: 1. Santa Lucia shaly clay loam, 30-50% slope (SfF) 2. Santa Lucia-Reliz Association, 30-75% slope (Sg) 3. Cieneba fine gravelly sandy loam, 30-70% slope (CcG) 4. San Andreas fine sandy loam, 30-75% slope (ScG) 5. Sheridan coarse sandy loam, 30-75% slope (SoG) 6. Junipero-Sur complex, 50-85% slope (Jc)	This policy is intended to reduce potential erosion or rapid runoff.	<u>Consistent:</u> The proposed project would be constructed and operated in conformance with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ), which require implementation of BMPs and measures to control and reduce erosion and stormwater runoff. The State requirements are incorporated in the municipal stormwater permit.
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 16.08 –Grading	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills Interconnection Improvements, and Ryan Ranch-Bishop Interconnection Improvements	***Chapter 16.08 -*** The Monterey County Grading Ordinance generally regulates grading activities that involve more than 100 cubic yards of excavation and fill. Minor fills and excavations ("cuts") of less than 100 cubic yards that are not intended to provide foundations for structures, or that are very shallow and nearly flat, are typically exempt from the ordinance, as are shallow footings for small structures. Submittal requirements for a County grading permit include site plans, existing contours and proposed contour changes, an estimate of the volume of earth to be moved, and geotechnical (soils) reports. Grading activities that involve over 5,000 cubic yards of soil must include detailed plans signed by a state-licensed civil engineer. Grading is not allowed to obstruct storm drainage or cause siltation of a waterway. All grading requires implementation of	This ordinance is intended to minimize soil erosion, and loss of topsoil, and associated environmental effects.	<u>Consistent:</u> As noted in Chapter 3, Description of the Project (Proposed Project), CalAm would be required to obtain a grading permit prior to project construction. As part of the grading permit review process, CalAm would have to demonstrate conformity with the requirements of the Monterey County Grading Ordinance, including specific provisions designed to minimize soil erosion, loss of topsoil, and associated environmental effects. In addition, the proposed project would be subject to the State Construction General Permit and the Monterey County Erosion Control Ordinance, which also require the implementation of specific construction-related BMPs to minimize erosion and soil loss, and prevent stormwater pollutants from leaving the construction sites.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone and inland areas) (cont.)				temporary and permanent erosion-control measures. Grading within 50 feet of a watercourse, or within 200 feet of a river, is regulated in the Monterey County Zoning Ordinance floodplain regulations. The Monterey County Grading Ordinance requires a soil engineering and engineering geology report (Section 16.08.110: Permit – Soil Engineering and Engineering Geology Reports [Ordinance 4029, 1999; Ordinance 2534, Section 110, 1979], unless waived by the Building Official because information of record is available showing such data is not needed. The soil engineering and engineering geology report must include the following: a. Data regarding the properties, distribution and strength of existing soils b. Recommendations for grading and corrective measures for project design, as appropriate c. An adequate description of the geology of the site and potential hazards. The recommendations from the soil engineering and engineering geology report must be incorporated in the grading plans and construction specifications.		
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 16.12 -Erosion Control	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Chapter 16.12 - Erosion Control.*** Requires that specific design considerations be incorporated into projects to reduce the potential of erosion and that an erosion control plan be approved by the County prior to initiation of grading activities.	This ordinance is intended to minimize erosion and soil loss, and associated water quality impacts, among other environmental effects.	<u>Consistent:</u> As noted in Chapter 3, Description of the Project (Proposed Project), CalAm would be required to obtain a grading permit prior to project construction. As part of the grading permit review process, CalAm would have to demonstrate conformity with the requirements of the Monterey County Erosion Control Ordinance, including through preparation of an erosion control plan indicating proposed methods for the control of runoff, erosion, and sediment movement. In addition, the proposed project would be subject to the State Construction General Permit, which also requires the implementation of specific construction-related BMPs to minimize erosion and soil loss, and prevent stormwater pollutants from leaving the construction sites.
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 16.16 - Development of Floodplains	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Chapter 16.16 - Development of Floodplains.*** Establishes methods of reducing flood losses such as controlling the alteration of natural floodplains and requiring new construction in the floodplain to incorporate flood-proofing measures (Floodplain regulations in the county extend to areas within 200 feet of rivers or within 50 feet of watercourses).	This ordinance is intended to protect people, property, and the environment from the effects of development in flood hazard areas.	<u>Consistent:</u> The Carmel Valley Pump Station and Castroville Pipeline would be located in a floodplain. Once constructed, the Castroville Pipeline would be underground and would have no effect on flooding. The Carmel Valley Pump Station would be constructed in accordance with Chapter 16.16 of the Monterey County Code. None of the other proposed aboveground facilities would be constructed in a floodplain.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy OS-3.3:*** Criteria for studies to evaluate and address, through appropriate designs and BMPs, geologic and hydrologic constraints and hazards conditions, such as slope and soil instability, moderate and high erosion hazards, and drainage, water quality, and stream stability problems created by increased stormwater runoff, shall be established for new development and changes in land use designations.	This policy is intended to protect people, property, and the environment from the effects of development in geologic and hydrologic hazard areas.	<u>Consistent:</u> The proposed project would be constructed and operated in conformance with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ and NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2014-0014]), which require implementation of BMPs and measures to control and reduce erosion and pollutant discharge, thus both stormwater runoff and quality. The State requirements are incorporated in the County's Municipal Code and the municipal stormwater permit.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy OS-4.2:*** Direct and indirect discharges of harmful substances into marine waters, rivers or streams shall not exceed state or federal standards.	This policy is intended to protect the quality of marine waters, rivers, and streams.	Inconsistent: The project would conform with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ and NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2014-0041], NPDES No. CAS000004 and Order No. R3-2014-0013, NPDES Permit No. CA0048551 for the Monterey Regional Water Pollution Control Agency Treatment Plant), which require BMPs and measures to control and reduce pollutants in the point and nonpoint discharges (e.g., stormwater runoff and brine discharge) from project facilities. The State requirements are incorporated in the County's Municipal Code and the municipal stormwater permit, and would be incorporated into any new permits obtained prior to project operation such as the amendment to the NPDES permit for discharging brine from the MPWSP Desalination Plant into Bay through the existing MRWPCA outfall. Operational discharges of the MPWSP under certain scenarios may exceed Ocean Plan water quality objective thresholds. This issue is discussed in Impact 4.3-5.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy OS-4.3:*** Estuaries, salt and fresh water marshes, tide pools, wetlands, sloughs, river and stream mouth areas, plus all waterways that drain and have impact on State Monterey County General Plan designated Areas of Special Biological Significance (ASBS) shall be protected, maintained, and preserved in accordance with state and federal water quality regulations.	This policy is intended to protect and maintain the quality of coastal waterways and designated ASBSs.	Inconsistent: The project would conform with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ and NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2014-0041], NPDES No. CAS000004 and Order No. R3-2014-0013, NPDES Permit No. CA0048551 for the Monterey Regional Water Pollution Control Agency Treatment Plant), which require BMPs and measures to control and reduce pollutants in the discharges from project facilities, which eventually drain into the designated ASBSs. The State requirements are incorporated in the County's Municipal Code and the municipal stormwater permit, and would be incorporated into any new permits obtained prior to project operation such as the amendment to the NPDES permit for discharging brine from the MPWSP Desalination Plant into Bay through the existing MRWPCA outfall. Operational discharges of the MPWSP under certain scenarios may exceed Ocean Plan water quality objective thresholds. This issue is discussed in Impact 4.3-5.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-2.3:*** All new development, including filling, grading, and construction, within designated 100-year floodplain areas shall conform to the guidelines of FEMA and the National Flood Insurance Program and ordinances established by the County Board of Supervisors. With the exception of the construction of structures, Routine and Ongoing Agricultural Activities shall be exempt from this policy.	This policy is intended to protect people and property from flood hazards.	Consistent: The Carmel Valley Pump Station and Castroville Pipeline would be located in a floodplain. Once constructed, the Castroville Pipeline would be underground and would have no effect on flooding. The Carmel Valley Pump Station would be constructed in accordance with Chapter 16.16 of the Monterey County Code and FEMA requirements for construction in the flood plain. None of the other proposed aboveground facilities would be constructed in a floodplain.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-2.6:*** Drainage and flood control improvements needed to mitigate flood hazard impacts associated with potential development in the 100-year floodplain shall be determined prior to approval of new development and shall be constructed concurrently with the development.	This policy is intended to protect people and property from flood hazards.	<u>Consistent:</u> The Carmel Valley Pump Station and Castroville Pipeline would be located in a floodplain. Once constructed, the Castroville Pipeline would be underground and would have no effect on flooding. The Carmel Valley Pump Station would be constructed in accordance with Chapter 16.16 of the Monterey County Code and FEMA requirements for construction in the flood plain. None of the other proposed aboveground facilities would be constructed in a floodplain.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-2.8:*** Alternative project designs and densities to minimize development in the floodplain shall be considered and evaluated.	This policy is intended to protect people and property from flood hazards.	<u>Consistent:</u> The Carmel Valley Pump Station and Castroville Pipeline would be located in a floodplain. Once constructed, the Castroville Pipeline would be underground and would have no effect on flooding. The Carmel Valley Pump Station would be constructed in accordance with Chapter 16.16 of the Monterey County Code and FEMA requirements for construction in the flood plain. None of the other proposed aboveground facilities would be constructed in a floodplain.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-3.1:*** Post-development, offsite peak flow drainage from the area being developed shall not be greater than pre-development peak flow drainage. Onsite improvements or other methods for storm water detention shall be required to maintain post-development, offsite, peak flows at no greater than predevelopment levels, where appropriate, as determined by the Monterey County Water Resources Agency.	This policy is intended avoid potential adverse effects of increased surface runoff from new development.	<u>Consistent:</u> Within the county of Monterey, the proposed project would be subject to State WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ and NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2014-0041], NPDES No. CAS000004 and Order No. R3-2014-0013) which are set forth in the local municipal stormwater permit and which require implementation of site design and stormwater control measures such that post-project flow drainage from the site must match pre-project flows.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-3.2:*** Best Management Practices to protect groundwater and surface water quality shall be incorporated into all development.	This policy is intended to protect groundwater and surface water quality from pollutants associated with development.	<u>Consistent:</u> The proposed project would be constructed and operated in conformance with State Construction General Permit and WDRs, which require implementation of BMPs and measures to control and reduce pollutants in the discharges from project facilities that could affect water quality. The State requirements are incorporated in the County's Municipal Code and the municipal stormwater permit, and would be incorporated into any new permits obtained prior to project operation. The issue of groundwater quality is addressed further in Section 4.7, Hazards and Hazardous Materials. As discussed in Section 4.7, groundwater quality issues would be addressed through implementation of mitigation measures, thereby resolving potential conflicts with applicable groundwater quality protection policies.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-3.3:*** Drainage facilities to mitigate the post-development peak flow impact of new development shall be installed concurrent with new development	This policy is intended avoid potential adverse effects of increased surface runoff from new development.	<u>Consistent:</u> Within the county of Monterey, the proposed project would be subject to State WDRs set forth in the local municipal stormwater permit, which require implementation of site design and stormwater control measures such that post-project flow drainage from the site must match pre-project flows.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-3.5:*** Runoff Performance Standards that result in an array of site planning and design techniques to reduce storm flows plus capture and recharge runoff shall be developed and implemented, where appropriate, as determined by the Monterey County Water Resources Agency.	This policy is intended to protect groundwater and surface water quality from pollutants associated with development.	Consistent: Within the county of Monterey, the proposed project would be subject to State WDRs set forth in the local municipal stormwater permit, which require implementation of site design and stormwater control measures such that post-project flow drainage from the site must match pre-project flows.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-3.9:*** In order to minimize urban runoff affecting water quality, the County shall require all future development within urban and suburban areas to implement Best Management Practices (BMPs) as approved in the Monterey Regional Storm Water Management Program which are designed to incorporate Low Impact Development techniques. BMPs may include, but are not limited to, grassy swales, rain gardens, bioretention cells, and tree box filters. BMPs should preserve as much native vegetation as feasible possible on the project site.	This policy is intended to protect surface water quality from pollutants that may be present in stormwater runoff.	Consistent: The proposed project would be subject to State WDRs set forth in the local municipal stormwater permit, which require implementation of site design and stormwater control and treatment measures (including LID measures where necessary) to control any pollutant discharges through the runoff and to minimize site runoff such that the post-project flow drainage from the site must match pre-project flows.
County of Monterey (coastal zone)	North County Land Use Plan	Land Use and Development	Source Water Pipeline and new Desalinated Water Pipeline	***Key Policy 4.3.4:*** All future development within the North County coastal segment must be clearly consistent with the protection of the area's significant human and cultural resources, agriculture, natural resources, and water quality.	This policy is intended to provide long-term management and protection of the County's coastal resources.	Consistent: The proposed project would be implemented in conformance of State Construction General Permit and WDRs set forth in the local municipal code and stormwater permit. The WDR requirements would be incorporated into any new permits obtained prior to project operation, such as minimizing erosion and sediment control and runoff. The project's implications for cultural, agricultural, and terrestrial biological resources are discussed in EIR Sections 4.15, Cultural Resources, 4.16, Agriculture and Forestry Resources, and 4.6, Terrestrial Biological Resources, respectively, which present additional discussion of the project's conformity with applicable North County Land Use Plan policies governing these resource areas, respectively.
County of Monterey (inland areas)	North County Area Plan	Seismic, Geologic, Flood, and Fire Hazards	Castroville Pipeline	***16.2.1.1 (NC):*** Site plans for new development shall indicate all perennial or intermittent streams, creeks, and other natural drainages. Development shall not be allowed within these drainage courses, nor shall development be allowed to disturb the natural banks and vegetation along these drainage courses, unless such disturbances are with approved flood or erosion control or water conservation measures.	This policy is intended to protect streams, creeks, and natural drainages from development disturbances.	Consistent: Within the county of Monterey, the proposed project would be subject to State WDRs set forth in the local municipal stormwater permit, which require implementation of site design and stormwater control measures such that post-project flow drainage from the site must match pre-project flows. The requirements are also aimed at minimizing soil erosion and protecting water quality.
County of Monterey (inland areas)	North County Area Plan	Seismic, Geologic, Flood, and Fire Hazards	Castroville Pipeline	***16.2.11 (NC):*** New development in North County shall be required to limit peak storm runoff to pre-project or pre-soil disturbance levels, unless otherwise dictated by the Monterey County Flood control and Water Conservation District (MCFCWCD). Runoff shall be limited by construction of detention ponds or other approved measures. In areas where the potential for erosion also exists, detention ponds shall be constructed for the dual process of storm water detention and sediment control.	This policy is intended to limit peak storm runoff to pre-project or pre-soil disturbance levels for new development.	Consistent: Within the county of Monterey, the proposed project would be subject to State WDRs set forth in the local municipal stormwater permit, which require implementation of site design and stormwater control measures such that post-project flow drainage from the site must match pre-project flows. The requirements are also aimed at minimizing soil erosion and protecting water quality.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Hydrology and Water Quality Policy A-1:*** At the project approval stage, the City shall require new development to demonstrate that all measures will be taken to ensure that runoff is minimized and infiltration maximized in groundwater recharge areas.	This policy is intended to control runoff from new development.	Consistent: Within the county of Monterey, the proposed project would be subject to State WDRs set forth in the local municipal stormwater permit, which require implementation of site design and stormwater control measures such that post-project flow drainage from the site must match pre-project flows. The requirements are also aimed at minimizing soil erosion and protecting water quality.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Hydrology and Water Quality Policy C-2:*** At the project approval stage, the City shall require new development to demonstrate that all measures will be taken to ensure that onsite drainage systems are designed to capture and filter out urban pollution.	This policy is intended to control runoff from new development.	Consistent: Within the county of Monterey, the proposed project would be subject to State WDRs set forth in the local municipal stormwater permit, which require implementation of site design and stormwater control measures such that post-project flow drainage from the site must match pre-project flows. The requirements are also aimed at minimizing soil erosion and protecting water quality.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Hydrology and Water Quality Policy A-1:*** At the project approval stage, the County shall require new development to demonstrate that all measures will be taken to ensure that runoff is minimized and infiltration maximized in groundwater recharge areas.	The intent of this policy is for new development to demonstrate implementation of measures to minimize and allow infiltration of the runoff.	Consistent: There would be no aboveground improvements that would constitute new development and increase in runoff. The proposed pipelines as part of the interconnections would be located underground and the surface along the pipeline alignments would be restored to pre-construction conditions.
Fort Ord Reuse Authority (County of Monterey)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Hydrology and Water Quality Policy C-2*****:** At the project approval stage, the County shall require new development to demonstrate that all measures will be taken to ensure that onsite drainage systems are designed to capture and filter out urban pollution.	The intent of this policy is for new development to demonstrate that onsite drainage systems are implemented such that they capture and filter out urban runoff.	Consistent: There would be no aboveground improvements that would constitute new development and increase in runoff. The proposed pipelines as part of the interconnections would be located underground and the surface along the pipeline alignments would be restored to pre-construction conditions.

SOURCE: City of Marina, 2000, 1982; City of Seaside, 2004b; FORA, 1997; Monterey County 1982, 1985, 1999, 2010a, 2010b 2013.

4.3.3 Evaluation Criteria

Implementation of the proposed project (MPWSP), which would include 10 slant wells at CEMEX, would have a significant impact related to surface water hydrology and water quality if it would:

- Violate any water quality standards or waste discharge requirements;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river in a manner that would result in substantial erosion or siltation on- or offsite;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increasing the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other authoritative flood hazard delineation map;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam;
- Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche,[27] tsunami, or mudflow;
- Exceed the numeric water quality objectives established in the Ocean Plan, including those for salinity that require discharges not to exceed 2 ppt over ambient salinity levels at the edge of the regulatory Brine Mixing Zone (BMZ) associated with operation of new desalination facilities or cause dissolved oxygen concentration to be depressed more than 10 percent from that which occurs naturally as the result of the discharge of oxygen demanding waste materials; or,
- Expose people or structures to a significant risk of loss, injury, or death involving coastal flooding from sea level rise.

Based on the nature of the proposed project, there would be no impacts related to the following evaluation criteria for the reasons described below:

- ***Place Housing within a 100-Year Flood Hazard Zone.*** The proposed project would not involve construction of new housing or structures for human occupancy within a 100-year flood hazard zone. Therefore, the evaluation criterion related to the placement of housing

[27] A seiche is a rhythmic motion of water in a partially or completely landlocked water body caused by earthquakes, landslides, tsunamis, or local changes in atmospheric pressure.

within a 100-year flood hazard zone is not applicable to the proposed project and is not discussed further.

- ***Expose People or Structures to Inundation by Seiche or Mudflow.*** The proposed project would have no effect on the frequency or probability of seiches (i.e., earthquake-induced oscillating waves in an enclosed water body such as the Del Monte Lake, Laguna del Rey, or El Estero Lake in the project area) because the proposed project would not create new enclosed water bodies or affect the frequency of earthquakes (see Section 4.2.5.2). Further, as the proposed project would not include construction of habitable structures, there would be no impacts related to property loss, injury, or death from a seiche. Due to the relatively flat topography of the project area, project implementation would not expose people or property to increased mudflow hazards. Therefore, no impact related to inundation by seiche or mudflow would result from the proposed project, and this topic is not discussed further.

- ***Expose People or Structures to a Significant Risk of Loss, Injury, or Death Involving Flooding, Including Flooding as a Result of the Failure of a Levee or Dam.*** There are no dams or levees adjacent to the project area. Dams that are located in the region include Los Padres Dam on the Carmel River and Nacimiento and San Antonio Dams on the Salinas River. The Castroville Pipeline and Castroville Pipeline Optional Alignment 1 would be located within the dam inundation zone for Nacimiento and San Antonio Dams, but would be located below ground and, as such, are unlikely to become damaged during such an event and would not redirect flood flows in a manner that causes increased flood hazard offsite. None of the other proposed facilities would lie within a predicted dam inundation zone. Implementation of the proposed project would not affect reservoir operations. Therefore, the proposed project would not expose people or structures to flooding damages due to failure of a dam or levee. There would be no impact associated with potential flooding from levee or dam failure. Relevant flooding-related issues are addressed under Impacts 4.3-8 through 4.3-10 in Section 4.3.5.2, below.

- ***Violate any water quality standards or waste discharge requirements, or substantially degrade water quality, as a result of increased temperatures from operational discharges.*** Based on published literature on desalination plant discharges, temperature is a commonly studied parameter due to the commingling of the brine streams from desalination plants with power plant discharges of cooling water that have high temperatures (Roberts et al., 2010; Dawoud and Al Mulla, 2012). Such commingling of brine and power plant thermal discharges increase the temperature of operational discharges as a result of processes inherent to power plant cooling operations that involve high temperatures (Dawoud and Al Mulla, 2012). However, the proposed MPWSP Desalination Plant would not operate in combination with a power plant or other facility that uses ocean waters for cooling purposes. There would be no heating mechanism or any process that would increase the temperature of the source water as it passes through the treatment units. Therefore, the desalination process under the MPWSP would not substantially increase the temperature of the discharged effluent, and thermal impacts on receiving waters are not discussed further.

4.3.4 Approach to Analysis

This analysis evaluates the potential effects of the MPWSP (proposed project/10 slant wells at CEMEX) on surface water hydrology and water quality during project construction and operations. The reported ambient water quality parameters and constituent levels described in

Section 4.3.1.3, above, are considered to be representative of baseline concentrations; these are used, in part, to assess the proposed project's impacts on water quality. Construction-related effects on surface water hydrology and water quality relate to direct and indirect impacts that could occur during construction activities, including site preparation and clearing, excavation, dewatering, and demobilization and site restoration. Operational impacts involve long-term effects related to facility siting, operational discharges, and maintenance activities. The impact analysis is organized by construction impacts and operational impacts.

The discussion of construction impacts presented in Section 4.3.5.1, below, is based on conservative assumptions regarding project construction activities, existing site conditions, and the applicable water quality objectives established by the Construction General Permit and the local ordinances.

The discussion of operational impacts presented in Section 4.3.5.2 is based on conservative assumptions regarding operational discharges and any potential post-construction or long-term effects from building the new facilities (such as increases in storm runoff from addition of impervious surfaces). Additionally, the assessment of long-term operational discharges of desalination brine is based on analyzing adverse impacts on water quality and the environment, including consideration of the risk of hypoxia, or so-called "dead zones," occurring in the marine environment as a result of increased salinity and/or decreased dissolved oxygen. To assess these risks, model analyses were conducted to characterize projected salinity increases in the immediate vicinity of the discharge point (diffuser port upon discharge) or near-field, as well as farther away from the discharge at the regulatory compliance point represented by the edge of the BMZ, which is 100 meters (348 feet) from the discharge point (far-field). Modeling analyses were conducted for a number of likely discharge scenarios, including brine-only discharges and combined discharges where the brine effluent may be mingled with secondary treated wastewater with different seasonal characteristics during a typical operational year. Additionally, model analyses were conducted to determine whether discharges would be in compliance with numeric Ocean Plan water quality objectives. Specifically, the in-pipe concentration of a broad suite of water quality constituents was calculated. Following such calculation, a dilution model was applied to determine each water quality constituent's concentration at the regulatory point of compliance to determine Ocean Plan compliance and identify potential impacts related to water quality.

The impact analysis describes if, and to what degree, the MPWSP would change the existing hydrology, water quality, and flooding conditions described in Section 4.3.1 and how the MPWSP would comply with or exceed any regulatory requirements described in Section 4.3.2 (for certain regulations, compliance determinations are discussed in Section 4.3.2 only). The severity of an impact is determined using the evaluation criteria identified in Section 4.3.4. Impacts on water quality associated with the brine discharge are evaluated in the context of and against the requirements specified in the recently amended Ocean Plan water quality objectives (SWRCB, 2016). In response to public comments, specific analyses were conducted to address risks related to the occurrence of hypoxia, or so-called "dead zones," in the proximity of the discharge point.

4.3.5 Direct and Indirect Effects of the Proposed Project

Table 4.3-8 summarizes the significance determinations related to surface water hydrology and water quality impacts of the proposed project (10 slant wells at CEMEX).

TABLE 4.3-8
SUMMARY OF IMPACTS –
SURFACE WATER HYDROLOGY AND WATER QUALITY

Impacts	Significance Determinations
Impact 4.3-1: Degradation of water quality associated with increased soil erosion and inadvertent releases of hazardous chemicals during general construction activities.	LS
Impact 4.3-2: Degradation of water quality from construction-related discharges of dewatering effluent from open excavations and water produced during well drilling and development.	LSM
Impact 4.3-3: Degradation of water quality from discharges of treated water and disinfectant from existing and newly installed pipelines during construction.	LS
Impact 4.3-4: Violate water quality standards or waste discharge requirements or degrade water quality from increased salinity as a result of brine discharge from the operation of the MPWSP Desalination Plant.	LSM
Impact 4.3-5: Violate water quality standards or waste discharge requirements or degrade water quality as a result of brine discharge from the operation of the MPWSP Desalination Plant.	LSM
Impact 4.3-6: Degradation of water quality due to discharges associated with maintenance of the subsurface slant wells and the ASR-5 and ASR-6 Wells.	LS
Impact 4.3-7: Alteration of drainage patterns such that there is a resultant increase in erosion, siltation, or the rate or amount of surface runoff.	LS
Impact 4.3-8: Alteration of drainage patterns such that there is an increase in flooding on- or offsite or the capacity of the stormwater drainage system is exceeded.	LS
Impact 4.3-9: Impedance or redirection of flood flows following construction due to the siting of project facilities in a 100-year flood hazard area.	LS
Impact 4.3-10: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to a tsunami.	LS
Impact 4.3-11: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise.	LS
Impact 4.3-C: Cumulative impacts related to surface water hydrology and water quality.	LSM

NOTES:
LS = Less than Significant impact, no mitigation proposed
LSM = Less than Significant impact with Mitigation

4.3.5.1 Construction Impacts

Impact 4.3-1: Degradation of water quality associated with increased soil erosion and inadvertent releases of hazardous chemicals during general construction activities. (*Less than Significant*)

General Construction Activities (Applies to All Project Components)

Project construction activities would involve site clearing and earthmoving activities, excavation and soil stockpiling, and temporary storage and use of chemicals such as fuel. Earthmoving activities associated with project construction would include vegetation removal, grading, excavation, soil stockpiling, and backfilling. Prior to construction mobilization, the contractor(s) would prepare construction work areas and staging areas by removing vegetation and debris, and grading these areas to provide a relatively level surface for the movement of construction equipment.

Soil disturbing activities could result in soil erosion and the migration of soil and sediment in stormwater runoff to downgradient water bodies and storm drains. Sediment from project-related construction activities could degrade the water quality of receiving water bodies such as the Salinas River and Monterey Bay.

As part of project construction, workers would install approximately 21 miles of pipelines. Most pipeline segments would be installed using conventional open-trench construction methods. Open excavations would also be required for construction of buildings and aboveground structures, including the MPWSP Desalination Plant, ASR-5 and ASR-6 Wells, and Carmel Valley Pump Station. Grading and earthwork would be required for foundations, parking areas, and access road improvements. The combination of all project construction activities would generate an estimated 25,110 cubic yards of excess spoils and construction debris. If not properly managed, stockpiled spoils could migrate offsite during precipitation events and could result in increased sedimentation in downstream receiving waters bodies.

Construction activities could also result in the accidental release of hazardous construction chemicals such as adhesives, solvents, fuels, and petroleum lubricants that, if not managed appropriately, could adhere to soil particles, become mobilized by rain or runoff, and degrade water quality.

Project construction activities would disturb more than one acre of soil, and therefore would be subject to the NPDES Construction General Permit requirements. As required under the Construction General Permit, a Storm Water Pollution Prevention Plan (SWPPP) would be prepared by a Qualified SWPPP Developer and a Qualified SWPPP Practitioner would oversee its implementation. The SWPPP, which would include specific measures and conditions to reduce or eliminate stormwater flow carrying any pollutants or sediment from the drilling and related construction activities, would be implemented throughout the duration of construction activities. As discussed in Section 4.3.2, Regulatory Framework, above, the SWPPP is required to include specific elements such as erosion and stormwater control measures that would be implemented onsite. At a minimum, the SWPPP must include the following:

- A description of construction materials, practices, and equipment storage maintenance;
- A list of pollutants likely to contact stormwater and site specific erosion and sedimentation control practices;
- A list of provisions to eliminate or reduce discharge of materials to stormwater;
- BMPs for fuel and equipment storage;
- Non-stormwater management measures to manage pollutants generated by activities such as paving operations and vehicle and equipment washing and fueling;

- The requirement that the appropriate equipment, materials, and workers be available to respond rapidly to spills and/or emergencies. All corrective maintenance or BMPs must be performed as soon as possible, depending upon worker safety; and
- Onsite post-construction controls.

Examples of typical construction Best Management Practices (BMPs) include scheduling or limiting certain activities to dry periods of the year, installing sediment barriers such as silt fencing and fiber rolls, maintaining equipment and vehicles used for construction, and tracking controls such as stabilization of construction access points. The development and implementation of BMPs such as overflow structures designed to capture and contain any materials that are inadvertently released from the storage containers on the construction site is also required. In accordance with the Construction General Permit, a Rain Event Action Plan would be required to ensure that active construction sites have adequate erosion and sediment controls in place prior to the onset of a storm event, even if construction is planned only during the dry season.

The construction contractor(s) would also be required to develop and implement a monitoring program as required under the NPDES Construction General Permit. The contractor would be required to conduct inspections of the construction site(s) prior to anticipated storm events and after the actual storm events. During extended storm events, the inspections would be conducted after every 24-hour period. The inspections would be conducted to: identify areas contributing to stormwater discharge; evaluate whether measures to reduce pollutant loadings identified in the SWPPP are adequate, were properly installed, and are functioning in accordance with the Construction General Permit; and determine whether additional control practices or corrective measures are needed. Mandatory compliance with the NPDES Construction General Permit requirements would prevent significant construction-related impacts on water quality during general construction activities.

In addition to the NPDES Construction General Permit requirements, construction contractor(s) would be required to comply with the local City municipal codes and the County code, depending on the construction activities and the pertinent jurisdictions. For example, construction of the subsurface slant wells in the CEMEX active mining area and approximately 0.25 mile (1,320 feet) of the Source Water Pipeline would be subject to the City of Marina Municipal Code, which requires the installation of erosion control measures such as sediment fencing and adequate set back from the shoreline to withstand erosion to the extent that the reasonable economic life of the use would be guaranteed without need for shoreline protection structures. (Refer to Section 4.2, Geology, Soils, and Seismicity, for a discussion of effects associated with coastal erosion.) Mandatory compliance with the water quality protection requirements of the Construction General Permit and the accompanying regulatory process would ensure that the necessary controls to minimize soil erosion, manage runoff, and protect water quality are in place during general construction activities. Therefore, the water quality impact associated with general construction activities would be less than significant.

Impact Conclusion

For all project facilities, mandatory compliance with NPDES Construction General Permit requirements would involve implementation of erosion and stormwater control measures, which would prevent substantial adverse effects on water quality during construction. The impact on water quality associated with increased soil erosion and sedimentation, and inadvertent releases of hazardous chemicals during general construction activities, would be less than significant for all project components. No mitigation is necessary.

Mitigation Measures

None proposed.

Impact 4.3-2: Degradation of water quality from construction-related discharges of dewatering effluent from open excavations and water produced during well drilling and development. (*Less than Significant with Mitigation*)

Discharges of Water Produced during Well Drilling and Development (Subsurface Slant Wells and ASR-5 and ASR-6 Wells)

Construction activities associated with the subsurface slant wells and ASR-5 and ASR-6 Wells would involve: drilling the borehole (well drilling); constructing the well inside the borehole by installing the well casing and well screens and filling the annulus around the casing with a gravel (filter) pack and cement seal (well construction); and then surging water in and out of the well screen openings to clean the borehole and properly settle the gravel pack (well development).

Subsurface Slant Wells

Drilling of the subsurface slant wells would involve the use of water, bentonite mud, and/or the use of environmentally-inert biodegradable additives to push the drill rig through the uppermost layer of dry dune sands (the uppermost 100 feet so, when drilling at an angle). Once the drill bit reaches groundwater, the mud slurry from the upper 100 feet of drilling would be pumped out and put it in a storage container for offsite hauling and disposal. Beyond this point only the water already present in the sand and potable water would be used to circulate the drill cuttings. Once the borehole and the casing and gravel pack have been installed, potable water would be circulated through the well casing to develop the well. The effluent produced during well development, which may contain soil cuttings and formation water (water present at depth in geologic materials), would be pumped to baker tanks to allow sediment to settle out. The clarified effluent would then either be conveyed to the existing discharge pipeline for the test slant well and discharged to the ocean waters of MBNMS via the MRWPCA ocean pipeline and outfall in accordance with the MRWPCA's NPDES permit, or percolated into the ground at the CEMEX active mining area. The muds generated during drilling in the wet dune sands (beyond the first 100 feet) and development of the subsurface slant wells would fall under the category of "Water Supply Well Drilling Muds" in the General Waiver. The water produced during slant well drilling and development would be considered a "water supply discharge" under the General Waiver of

WDRs for Specific Types of Discharges (General Waiver) (RWQCB Resolution R3-2014-0041), discussed above in Section 4.3.2, Regulatory Framework. CalAm would not be required to submit a waste discharge report. However, the following conditions of the General Waiver would apply:

- The discharge shall be spread over an undisturbed, vegetated area capable of absorbing the top-hole water and filtering solids in the discharge, and spread in a manner that prevents a direct discharge to surface waters;
- The pH of the discharge shall be between 6.5 and 8.3;
- The discharge shall not contain oil or grease;
- The discharge area shall not be within 100 feet of a stream, water body, wetland, or streamside riparian corridor;
- The discharger shall implement appropriate management practices to dissipate energy and prevent erosion;
- The discharger shall implement appropriate management practices to preclude discharge to surface waters and surface water drainage courses; and
- The discharger shall immediately notify the Central Coast RWQCB staff of any discharge to surface waters or surface water drainages. The discharge shall not have chlorine or bromine concentrations that could impact groundwater quality.

Because the disposal of water produced during well drilling and development activities would comply with the conditions of the MRWPCA's NPDES permit and General Waiver, which are set to prevent impacts on water quality, there would be no injury to sanctuary resources, so the impact would be less than significant and no mitigation is proposed.

ASR Injection/Extraction Wells (ASR-5 and ASR-6 Wells)

As described in Section 3.5.7 of Chapter 3, Description of the Proposed Project, the ASR injection/extraction wells would be drilled without the use of drilling muds containing bentonite clays. However, when necessary and depending on the formation material encountered, certain commercially available additives could be combined with the drilling water to increase fluid viscosity and stabilize the walls of the boring to prevent reactive shale and clay from swelling and caving into the hole. Other products used to enhance the drilling performance help reduce the buildup of solids, decrease friction, and aid in reducing solids suspension. Drilling mud additives are commonly used by the well drilling industry for the drilling and installation of groundwater wells. Because the additives are combined with the water and are circulated through the borehole annulus during drilling, they react locally within the borehole and do not migrate into the surrounding groundwater formation. The additives are noncorrosive, biodegradable and do not contain chemicals that would contaminate the groundwater supply.

The muds and clay slurry generated during the drilling and development of the proposed ASR-5 and ASR-6 Wells in the Fitch Park military housing area would fall under the category of "Water Supply Well Drilling Muds" in the General Waiver. Water extracted during drilling and development of the ASR-5 and ASR-6 Wells would be placed in portable holding tanks to settle out solids, conveyed to a 1.4-acre natural depression located east of the intersection between San Pablo Avenue and General Jim Moore Boulevard, and subsequently percolated into the ground. Similar to the subsurface slant wells, it is anticipated that discharges of water produced during the drilling and development of the ASR-5 and ASR-6 Wells would be conducted in accordance with the General Waiver. Thus, the same conditions of the General Waiver described above for the slant wells would also apply to the ASR-5 and ASR-6 Wells.

Adherence to the conditions of the General Waiver would prevent significant adverse effects on water quality from discharges of water produced during drilling and development of the ASR-5 and ASR-6 Wells. The impact would be less than significant.

Dewatering Discharges (All Other Project Facilities)

Dewatering could be required during construction to create a dry work area if surface water or groundwater is encountered in excavations. Project construction activities, particularly open-cut trenching, jack-and-bore, and microtunneling for the installation of pipelines, could intercept shallow or perched groundwater and require temporary localized dewatering to facilitate construction.

Most of the dewatering effluent produced during construction and excavation is considered a low threat and could be discharged to land or the stormwater drainage system provided it complies with the *General WDRs for Discharges with a Low Threat to Water Quality* (Order No. R3-2011-0223, NPDES Permit No. CAG993001) (RWQCB, 2011a). The construction contractor(s) would be required to control, test, and treat the extracted water as needed to minimize or avoid water quality degradation, erosion, and sedimentation in the receiving waters. To receive coverage under the General WDRs, CalAm would submit a NOI along with the following materials to the Central Coast RWQCB (2011a):

- A list of all chemicals (including Material Safety Data Sheets) added to the water and the concentrations of such additives in the discharged effluent;
- Certified analytical results of the effluent for all priority toxic pollutants listed in Attachment D of the General WDRs. These analyses would fulfill the requirements set forth in the California Toxics Rule to evaluate the potential for water quality degradation and establish effluent limits, unless the discharge meets all requirements for a conditional exception;
- Certified analytical results of representative samples of the receiving surface water collected 50 feet upstream and 50 feet downstream from the point of discharge, respectively. Alternately, if access is limited, the samples can be collected at the first point upstream and downstream of the discharge, respectively, that is accessible for the following constituents: pH, temperature, color, turbidity, and dissolved oxygen;
- For low-threat discharges from proposed facilities, CalAm would provide analytical data for discharges from similar existing facilities, or information regarding the anticipated discharge characteristics of the proposed facility based on the specific facility design. As part of facility startup, CalAm would submit all analytical results required in Section A of the General WDRs; and

- If the concentration of any constituent in the effluent sampled under the second bullet above exceeds the applicable criterion listed in Attachment D of the General WDRs, CalAm may submit a Reasonable Potential Analysis[28] consistent with Section 1.3 of the State Implementation Policy or Appendix VI of the Ocean Plan, as applicable.

As discussed in Section 4.3.2, Regulatory Framework, and in the bulleted list above, CalAm would be required to test the dewatering effluent for possible pollutants. The analytical constituents for such tests are generally based on the source of the water, the land use history of the construction site, and potential impacts on the quality of the receiving water. If the dewatering effluent meets the water quality requirements of the General WDRs, CalAm's construction contractor(s) would discharge the dewatering effluent to vegetated upland areas or the local storm drain system in accordance with the General WDRs. It is assumed most dewatering effluent would be disposed of in accordance with the General WDRs.

As described in detail under **Impact 4.7-2**, sites with known soil and/or groundwater contamination are located close to or extend into the proposed construction alignments for pipelines. The contaminants with the potential to be encountered during project construction activities include petroleum hydrocarbons, VOCs, PAHs, and metals from gasoline service stations, and dry cleaners. The dewatering of contaminated groundwater during construction excavation activities would be considered a significant impact if the contaminated groundwater (i.e., dewatering effluent) were not handled properly and released into the environment. The impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.7-2b (Soil and Groundwater Management Plan)**, which requires CalAm or its contractor to develop a groundwater dewatering control and disposal plan that identifies locations where groundwater dewatering is likely to be required, the method to analyze groundwater for hazardous materials, and appropriate treatment and/or disposal methods. If the dewatering effluent contains contaminants that exceed the requirements of the *General WDRs for Discharges with a Low Threat to Water Quality* (Order No. R3-2011-0223, NPDES Permit No. CAG993001), the construction contractor shall contain the dewatering effluent in a portable holding tank for appropriate offsite disposal or discharge.

Impact Conclusion

The water extracted during drilling and development of the subsurface slant wells and ASR-5 and ASR-6 Wells would be disposed of in accordance with the MRWPCA's NPDES permit (for discharges via the ocean outfall) and General Waiver (RWQCB Resolution R3-2014-0041) for clarified effluent that is percolated into the ground. All discharges of water produced during well drilling and development would occur in compliance with regulatory requirements that are protective of the receiving waters. Therefore, the impact associated with discharges of water produced during drilling and development of the subsurface slant wells and ASR-5 and ASR-6 Wells would be less than significant.

With respect to general construction dewatering, it is anticipated that most dewatering effluent would be disposed of in accordance with the General WDRs (Central Coast RWQCB Order R3-

[28] A Reasonable Potential Analysis is the process for determining whether any of the constituents in a discharge causes, has reasonable potential to cause, or contributes to an exceedance of a water quality standard.

2011-0223). However, discharges of dewatering effluent exceeding the water quality limitations in the General WDRs would result in a significant impact. This impact would be reduced to a less-than-significant level with implementation of the **Mitigation Measure 4.7-2b**. Thus, for all project facilities except the subsurface slant wells and ASR-5 and ASR-6 Wells, the impact associated with discharges of dewatering effluent would be less than significant with implementation of mitigation.

Mitigation Measures

Mitigation Measure 4.7-2b applies to all project components except the subsurface slant wells and the ASR-5 and ASR-6 Wells.

Mitigation Measure 4.7-2b: Soil and Groundwater Management Plan.

(See Section 4.7, Hazards and Hazardous Materials, for the description.)

Impact 4.3-3: Degradation of water quality from discharges of treated water and disinfectant from existing and newly installed pipelines during construction. (*Less than Significant)*

Prior to constructing the connections between existing and new pipelines, segments of existing pipelines would need to be drained and disinfected before being returned to service. Newly installed pipelines (i.e., the Source Water Pipeline, new Desalinated Water Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Brine Discharge Pipeline, new Transmission Main, ASR pipelines [ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline], and the pipelines associated with the Ryan Ranch-Bishop Interconnection Improvements and Main System-Hidden Hills Interconnection Improvements) would also be disinfected before being put into service. It is anticipated that chlorine would be used for disinfection. The treated water generated from the draining of existing pipelines and the effluent generated from disinfection of newly installed pipelines would be discharged to the local storm drainage system or discharged in compliance with stormwater control requirements in the respective local jurisdictions (e.g., to percolation ponds as may be directed by U.S. Army approvals on Army-owned property). Without proper controls, these discharges could adversely affect water quality in downstream receiving water bodies by increasing turbidity (if discharged directly without appropriate treatment) or due to high chlorine (the primary disinfectant used for drinking water) concentrations. However, the discharges would be subject to the *General WDRs for Discharges with Low Threat to Water Quality* (Order No. R3-2011-0223, NPDES Permit No. CAG993001). The General WDRs require that CalAm neutralize the residual chlorine remaining in disinfection effluent such that detectable chlorine levels are less than 0.02 mg/L, and require that the total dissolved solids be within surface water and groundwater quality objectives (RWQCB, 2011a). Compliance with the General WDRs and the conditions therein would protect water quality in receiving water bodies. Therefore, the impact would be less than significant.

All Other Proposed Facilities

None of the other proposed facilities (i.e. the Slant Wells, Desalination Plant, and Carmel Valley Pump Station) are anticipated to require flushing and generate disinfection effluent prior to being brought online. Thus, no impact would result.

Impact Conclusion

Adherence to the General WDRs (Order No. R3-2011-0223, NPDES Permit No. CAG993001) would ensure this impact is less than significant for the Source Water Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Brine Discharge Pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR pipelines, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements. Construction of all other proposed project facilities would have no impact on water quality associated with discharges of treated water or disinfection effluent.

Mitigation Measures

None proposed.

4.3.5.2 Operational and Facility Siting Impacts

Impact 4.3-4: Violate water quality standards or waste discharge requirements for salinity, or degrade water quality from increased salinity as a result of brine discharge from the operation of the MPWSP Desalination Plant. (*Less than Significant with Mitigation*)

Operational discharges from the MPWSP would locally increase salinity levels and thus could violate water quality standards or waste discharge requirements or otherwise degrade the water quality of receiving waters in Monterey Bay, within MBNMS. As described in Section 4.3.2.2, the Ocean Plan establishes receiving water salinity limitations for brine discharges from desalination facilities to protect the quality of ocean waters for beneficial uses (such as aquatic habitat). This impact analysis uses the Ocean Plan's receiving water salinity limitations as significance thresholds, incorporates the Ocean Plan's requirements relating to water quality, and is consistent with the methods prescribed in the Ocean Plan for assessing increased salinity from the operation of desalination plants. In response to public comments, additional analysis is provided to address risks of increased salinity causing hypoxia, or so-called "dead zones" in the marine environment.

The Ocean Plan limits the increase of salinity of receiving water from desalination plant discharges to a daily maximum of 2 parts per thousand (ppt) above natural background salinity as measured no further than 100 meters (328 ft) horizontally from each discharge point (known as the brine mixing zone [BMZ]). For the MPWSP, the BMZ represents an area of approximately 27 acres based on the existing outfall diffuser structure (see Figure 4.3-7). While salinity increment limitations of 2 ppt must be met at the boundary of the BMZ, the Ocean Plan also requires that dischargers estimate salinity levels within the BMZ, where salinity may exceed 2.0 ppt above natural background salinity, to determine the potential frequency and intensity of impacts on marine biological resources and beneficial uses. As described in Section 4.3.3, a significant impact related to water quality, water quality standards or waste discharge requirements would occur if operational discharges from the MPWSP resulted in salinity greater than 2 ppt over ambient salinity levels at the edge of the BMZ. Consistent with Ocean Plan and MBNMS requirements, this impact analysis also evaluates the salinity and dilution dynamics of operational discharges within the BMZ by determining the Zone of Initial Dilution (ZID) for each discharge scenario and describes areas where salinity would exceed 2 ppt. The determination of the dilution dynamics, extent of the ZID, and determination of areas where salinity exceeds 2 ppt supports water quality analyses for other constituents (i.e., in addition to salinity) listed in the Ocean Plan (see Impact 4.3-5) and analysis of impacts on marine habitat and wildlife presented in Section 4.5, Marine Biological Resources. Additionally, the analysis addresses comments received during the public comment period for the April 2015 DEIR, on the fate and travel path of the discharge plume beyond the BMZ and the potential for hypoxia[29] to occur near the seabed. The Ocean Plan limits dissolved oxygen decreases as a result of operational discharges to no more than 10 percent from that which occurs naturally. Exceeding this standard for dissolved oxygen would result in a significant impact related to water quality, water quality standards or waste discharge requirements.

Introduction to the Impact Analysis for Salinity

To comprehensively assess and describe the water quality effects associated with operational discharges and increased salinity of the proposed project (10 Slant Wells at CEMEX), Impact 4.3-4 is structured as follows:

- **Operational Discharge Scenarios**: The impact analysis first describes the range of operational discharges that could occur with implementation of the MPWSP to provide context for the modeling completed in support of the project analyses.
- **Approach to Analysis**: This subsection describes the various studies and model analyses related to plume dynamics, dilution, and salinity that were completed in support of the analysis of impacts related to the Project.
- **Dense Operational Discharges - Salinity Impact Analysis**: The analysis presents an assessment of effects on receiving water salinity levels for operational discharges that are denser than the ambient receiving sea water. Sinking plumes have substantially lower initial dilution from turbulent mixing than positively buoyant, or rising, plumes (i.e., discharges with densities less than the receiving seawater). As such, the evaluation of potential salinity impacts from MPWSP operational discharges focuses on negatively buoyant discharges.
- **Dense Operational Discharges - Areas Exceeding 2 ppt Salinity**: Consistent with Ocean Plan requirements, this analysis evaluates the plume dynamics of dense, negatively buoyant operational discharges to quantify areas where salinity would exceed 2 ppt above natural background salinity around the outfall diffuser. Areas determined to exceed 2 ppt above natural background salinity are considered further in Section 4.5, Marine Biological

[29] Hypoxia, or oxygen depletion, is an environmental phenomenon where the concentration of dissolved oxygen in the water column decreases to a level that can no longer support living aquatic organisms (so-called “dead zones”)

Resources, in the context of assessing and quantifying potential for mortality of aquatic wildlife and loss of habitat from operational discharges.

- **Dense Operational Discharges – Additional Considerations**: This subsection addresses concerns raised during the public comment period for the April 2015 DEIR. The comments received involved the brine discharge and its travel path beyond the BMZ, concerns relating to the propagation of a dense saline plume along the sea floor, and the potential for hypoxia to occur near the seabed as a result of extremely elevated salinity levels adjacent to the outfall diffuser.
- **Buoyant Operational Discharges – Analysis and Discussion**: The analysis evaluates positively buoyant operational discharges (i.e., that have densities less than the receiving seawater) using model analyses to determine salinity, dilutions, and plume behavior.
- **Impact Summary and Conclusion**: The above-described analyses are followed by a summary analysis that characterizes the entire range of results for the project. This section provides an impact statement and conclusion in the context of the relevant significance criteria.

Operational Discharge Scenarios

Described here is the range of operational discharge scenarios that could occur with implementation of the MPWSP to provide context for the modeling completed in support of the project impact analyses. The scenarios include brine-only discharges and combined discharges, which occur during certain times of the year when the brine would be blended with secondary treated wastewater (when available) from the MRWPCA Regional Wastewater Treatment Plant.

The Desalination Plant of the proposed project would treat the source water drawn from the slant wells at a 42 percent recovery rate, and approximately 14 mgd of brine would be generated, consisting of concentrates from the pretreatment and reverse osmosis (RO) processes as well as waste effluent produced during routine backwashing and operation and maintenance of the pretreatment filters (see Section 3.2.2 for details). The brine generated in the desalination process would be discharged into MBNMS through the MRWPCA's existing ocean outfall (see **Figure 3-2**). The MRWPCA outfall consists of a 2.1-mile-long pipeline that terminates at a 1,100-foot-long diffuser resting above the ocean floor at approximately 90 to 110 feet below sea level. The outfall pipe consists of a 60-inch internal diameter (ID) reinforced concrete pipe (RCP), and the diffuser consists of 480 feet of 60-inch RCP with a single taper to 840 feet of 48-inch ID. The diffuser has 172 2-inch diameter ports: 65 in the 60-inch section, 106 in the 48-inch section and an opening at the end of the diffuser pipe (Figure A-4, Appendix D; the "end gate"). The ports discharge horizontally, alternating on both sides of the diffuser, at a spacing of 16 ft on each side except for one port in the taper section that discharges vertically for air release. The 42 ports closest to shore are presently closed, so there are 129 open ports distributed over a length of approximately 1,024 ft (312 m). The 129 open ports are fitted with 4-inch Tideflex "duckbill" check valves (the "4-inch" refers to the flange size, not the valve opening). Because the valves open as the flow through them increases, the cross-sectional area is variable. The opening at the bottom of the end gate (from which flows exit the diffuser for flushing purposes) is about two inches high. **Appendix D1** discusses the effect of the valves on the flow distribution in the diffuser as well as the procedure used for analyzing the internal hydraulics of the outfall and diffuser for the dilution modeling completed as part of the salinity impact assessment**.** The diffuser, representing the brine discharge point, would disperse the brine stream, thereby minimizing differences in salinity and other water quality parameters between the discharged brine and the surrounding seawater (see Section 3.2.2.5 for additional information).

During certain times of the year, the brine would blend with secondary treated wastewater (when available) from the MRWPCA Regional Wastewater Treatment Plant, forming a combined discharge (discussed in Section 3.2.2). **Table 4.3-9** shows the monthly projected brine flows from the MPWSP Desalination Plant and the 1998-2012 average monthly wastewater flows from the MRWPCA as well as the estimates for 2017 maximum and minimum that were developed in early 2017.

TABLE 4.3-9
MONTHLY AVERAGE FLOWS OF SECONDARY-TREATED WASTEWATER FROM THE MRWPCA REGIONAL WASTEWATER TREATMENT PLANT (1998–2012 AND PROJECTED 2017) AND THE ESTIMATED BRINE STREAM UNDER THE MPWSP
(MGD)

Months	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
MPWSP Brine	13.98	13.98	13.98	13.98	13.98	13.98	13.98	13.98	13.98	13.98	13.98	13.98
1998–2012 Average Treated Wastewater from MRWPCA[1]	19.78	18.41	14.68	7.02	2.40	1.89	0.90	1.03	2.79	9.89	17.98	19.27
2017 Max. Treated Wastewater[2]	18.8	13.7	16.2	8.68	1.12	0.83	0.91	0.88	2.38	12.29	18.5	19.5
2017 Min. Treated Wastewater[2]	2.8	5.0	0.5	0	0	0	0	0	0	1.49	5.5	16.5

SOURCES: [1]MRWPCA, 2013; [2]Brown and Caldwell, 2017.

As shown in **Table 4.3-9**, the treated wastewater flow varies throughout the year, with the highest flows observed during the non-irrigation season (November through March) and the lowest flows observed during the irrigation season (April through October), when the treated wastewater is processed through the SVRP for tertiary treatment and distributed to irrigators through the CSIP. Based on the monthly projected brine flows from the MPWSP Desalination Plant and the average monthly wastewater flows from the MRWPCA, the following discharge scenarios were assessed (summarized in **Table 4.3-10**):

- **Scenario 1:** Baseline condition – current operational discharges of secondary treated MRWPCA wastewater without desalination brine.
- **Scenario 2:** Desalination brine only – proposed discharge of project brine without wastewater into Monterey Bay/MBNMS through the outfall. This scenario would occur during the irrigation season as a result of the MRWPCA wastewater flows being provided to irrigators. To conservatively assess the potential impacts from operational discharges, it is assumed for this analysis that the discharge of brine occurs without dilution by wastewater during the entire irrigation season (April - October).

TABLE 4.3-10
PROPOSED PROJECT DISCHARGE SCENARIOS MODELED

Scenario No.	Discharge Scenario	Constituent Flows[a] (mgd)	
		Secondary Effluent	Desal Brine
Typical Discharge Scenarios			
1	Secondary Effluent (SE) Only	19.78	0
2	Brine only	0	13.98
3	Brine + Low (1) SE	1	13.98
4	Brine + Low (2) SE	2	13.98
5	Brine + Low (3) SE	3	13.98
6	Brine + Low (4) SE	4	13.98
7	Brine + Moderate (5) SE	5	13.98
8	Brine + Moderate (6) SE	6	13.98
9	Brine + Moderate (7) SE	7	13.98
10	Brine + Moderate (8) SE	8	13.98
11	Brine + Moderate (9) SE	9	13.98
12	Brine + High (10) SE	10	13.98
13	Brine + High (15) SE	15	13.98
14	Brine + High (19.78) SE	19.78	13.98
High Brine Discharge Scenarios (post-shutdown operations)			
15	High Brine only	0	16.31
16	High Brine + Low (1) SE	1	16.31
17	High Brine + Low (2) SE	2	16.31
18	High Brine + Low (3) SE	3	16.31
19	High Brine + Low (4) SE	4	16.31
20	High Brine + Moderate (5) SE	5	16.31
21	High Brine + Moderate (6) SE	6	16.31
22	High Brine + Moderate (7) SE	7	16.31
23	High Brine + Moderate (8) SE	8	16.31
24	High Brine + Moderate (9) SE	9	16.31
25	High Brine + High (10) SE	10	16.31
26	High Brine + High (12) SE	12	16.31
27	High Brine + High (14) SE	14	16.31
28	High Brine + High (16) SE	16	16.31

NOTES:

[a] MRWPCA also accepts 0.01mgd of trucked brine waste for ocean disposal (“hauled waste”), which is stored in a pond and mixed with secondary effluent prior to being discharged. This “hauled brine” is included in all model analyses for dilution predictions.

SE= Secondary Effluent (MRWPCA wastewater).

SOURCE: Roberts 2017 (Appendix D1).

- **Scenarios 3 through 14**: Desalination brine with wastewater – proposed discharge of project brine with varying amounts of wastewater. These scenarios would occur during the non-irrigation season (November - March). For the combined discharge scenario, the analysis accounted for different wastewater flows ranging from 15 mgd to 19.78 mgd that result in a positively buoyant plume to a range of lower documented wastewater flow rates of 1 mgd to 10 mgd that result in a negatively buoyant plume.

- **Scenario 15**: Increased volumes of desalination brine only – as described in Section 3.4.1, following a shutdown of the desalination facility for repair or routine maintenance, CalAm may temporarily (up to 11 days) operate the desalination facility with one additional reverse osmosis module in service to catch up on production; however, the total annual production would not be increased. As with Scenario 2, brine would be discharged without wastewater into Monterey Bay/MBNMS through the outfall during the irrigation season as a result of the MRWPCA wastewater flows being provided to irrigators.

- **Scenarios 16 through 28**: High desalination brine volumes with wastewater – as with Scenarios 3 through 14, the analysis accounted for different wastewater flows being combined with the higher volume brine discharges.

The combined discharge during the non-irrigation season would be consistent with the recommendations in the SWRCB's technical report on discharges of brine from desalination plants[30] and with the amendments to the Ocean Plan (SWRCB, 2015; 2016) by "co-discharging it with municipal wastewater" and discharging it "through a multiple-port diffuser system" (SWRCB, 2016). The proposed brine-only discharge during the irrigation season would adhere to the panel's recommendation for discharge through a multiple-port diffuser system.

Approach to Analysis

Described here are the various studies and model analyses related to plume dynamics, dilution, and salinity that were completed in support of the analysis of impacts related to the proposed project.

Based on the amended Ocean Plan (SWRCB, 2016) described in Section 4.3.2, Regulatory Framework, the MPWSP Desalination Plant would result in a significant water quality impact if operational discharges would exceed a daily maximum of 2 ppt above natural background salinity as measured at the BMZ (328 ft horizontally from the discharge point). Discharges that are denser than the receiving seawater would result in a sinking plume that impacts the sea floor at some distance from the diffuser nozzle (**Figure 4.3-5**). Because of its high exit velocity, the jet of effluent discharged from the diffuser port entrains seawater that mixes with and dilutes the effluent. Because sinking plumes have substantially lower initial dilutions than positively buoyant or rising plumes, the evaluation of potential salinity impacts from operational discharges focuses on sinking plumes (i.e., those plumes comprised mainly of brine). However, the analysis also addresses the dilution dynamics and salinity of rising plumes.

[30] The recommendations were made as part of the Southern California Coastal Water Research Project, discussed in Section 4.3.2, Regulatory Framework.

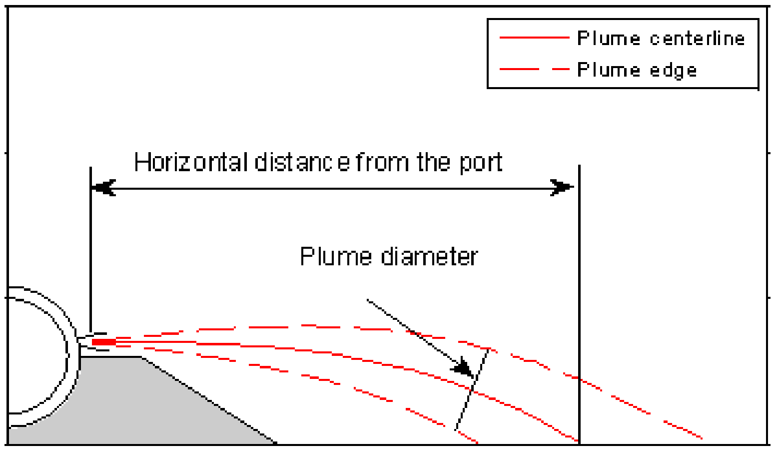

Figure 4.3-5
Illustrations of the Trajectory
of a Dense Brine Discharge Plume

Flow Science, Inc. (2014; see **Appendix D2**) conducted near-field (within the BMZ) modeling of the proposed MPWSP discharge through the existing MRWPCA outfall in Monterey Bay. Input to the model included temperature and salinity levels derived from within the ambient water column at Monterey Bay Aquarium Research Institute Monitoring Station C1 (see Figure 3 in **Appendix D2**) during the period from 2002 to 2012. This monitoring station is located approximately 5 miles northwest of the MRWPCA outfall at the head of the Monterey Submarine Canyon in an area considered representative of ambient conditions for the proposed discharge. The salinity and temperature of ocean water determine its density (discussed in detail in Section 4.3.1.3), which in turn affects the movement, dilution, and mixing of the brine plume upon discharge. Based on data (2010–2012) from Monterey Bay, a temperature, salinity, and density profile was developed for the upper 98 feet of the water column (the outfall diffuser is located at a depth of approximately 100 feet) for the three oceanic conditions (upwelling, oceanic, and Davidson, described in detail in Section 4.3.1.3, above). However, as described below, the temperature, salinity, density profile was subsequently updated to include more recent and site specific data from recent monitoring efforts. As discussed in Section 4.3.1, Setting / Affected Environment, salinity in Monterey Bay in the project vicinity, as monitored by the Monterey Bay Aquarium Research Institute, ranges between 33.1 and 34.2 ppt, with a natural variability of 3.3 percent or approximately 1.1 ppt and a temperature range from 47.5°F to 59.4°F. More recently, monthly measurements of salinity and temperature were collected between February 2014 and December 2015 by Applied Marine Sciences (Appendix D1) around the MRWPCA outfall at varying depths and locations. The purpose of this monitoring effort was to gather data over a nearly two-year period that reflected ocean conditions in the immediate vicinity of the outfall structure and to support model analyses. Seasonal average temperatures ranged between 52.7°F and 58.1°F and seasonal salinity levels ranged from 33.3 to 33.9 ppt at the depth of the diffuser.

An ocean current velocity of zero was used for the near-field modeling. This represents a worst-case (conservative) assessment scenario for dilution and mixing as it assumes no additional mixing or dilution from wave or tidal currents occurs in addition to that resulting from the momentum of the discharged plume (Flow Science, Inc., 2014; SWRCB, 2012a). A wastewater-only discharge scenario (Scenario 1) was modeled for the Davidson oceanic condition to understand the dynamics of the baseline non-irrigation-season condition. The brine-only discharge scenario (Scenario 2) was modeled for all three oceanic climate conditions,[31] and combined discharge scenarios (Scenarios 3 through 6) with varying amounts of wastewater were modeled for the non-irrigation season. For the combined discharge scenarios, the analysis incorporated data on salinity, temperature, and total dissolved solids (representative of salinity) measured in the treated wastewater from the MRWPCA Regional Wastewater Treatment Plant.[32]

Consistent with the recommendations in the SWRCB's technical report on discharges from desalination plants (SWRCB, 2012a), the near-field modeling analysis (Flow Science, Inc., 2014) studied the plume behavior in terms of the density (a function of temperature and salinity) and flow rate of the discharge. The differences between the salinity levels in the discharge stream and in the ambient (or receiving) water were calculated by determining the size of the brine plume, its trajectory in the ocean and the dilution of the brine with the ambient seawater within the ZID (which occurs within the BMZ for all discharge scenarios assessed, as described below). As in Section 4.3.2, Regulatory Framework, under the Ocean Plan, the ZID (or the regulatory mixing zone) is defined as the zone adjacent to a discharge where momentum and buoyancy-driven mixing produces rapid dilution of the discharge (Flow Science, Inc., 2014). The size of the plume and the extent of dilution depends in part on whether the plume is positively buoyant (rising) or negatively buoyant (dense or sinking) (**Figure 4.3-4**). In the near-field analysis for a sinking plume, the edge of the ZID would be located at the point where the plume contacts the sea floor. The edge of the ZID for a buoyant plume would be located at the point where the plume reaches the water surface or attains a depth level at which the density of the diluted effluent plume becomes the same as the density of ambient water (i.e., the "trap" level).

Flow Science, Inc. (2014) used two analytical methods — the Semi-Empirical Analysis (SEA) and the mathematical model UM3 in the US EPA model suite Visual Plumes (VP) — to characterize and understand the range of dilution that might be expected to occur for the operational discharges from the MRWPCA outfall diffuser; both methods are consistent with the regulatory approach recommended by the SWRCB for analyzing the brine discharge (Flow Science, Inc., 2014; SWRCB, 2012b). The model represents a constant discharge for each of the defined scenarios, and the discharge continues to move away from the port. The VP method is widely used in diffuser discharge analyses; however, data from the SEA method is presented to provide redundancy in the analysis and confirmation of the results (Flow Science, Inc., 2014; Roberts, 2016).

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[31] The brine-only discharge during the non-irrigation season (January) is a less likely operating scenario because at least some wastewater would flow through the outfall, along with the brine, throughout the year. Nonetheless, this scenario was evaluated during the Davidson condition (January), as was the MRWPCA wastewater-only discharge, to understand how the brine would influence existing conditions.

[32] Wastewater monitoring data from the MRWPCA Regional Wastewater Treatment Plant for salinity and total dissolved solids (1998–2012) and for temperature (2006–2012).

In response to public comments on the 2015 Draft EIR and at the request of MBNMS, the modeling analysis completed by Flow Science, Inc. (2014; **Appendix D2**) was peer reviewed and updated by Roberts[33] (2016; **Appendix D1**), as described below (and discussed in detail in **Appendix D1**) to:

- Update the assessed operational discharge scenarios to ensure consistency with proposed operations (summarized in **Table 4.3-10**).
- Update in the model the number of open diffuser ports (129 versus 120) and the height of the ports off the ocean floor (4 feet versus 3.5 feet) to reflect current baseline conditions regarding the status of the outfall diffuser.
- Update data on density stratification at the MRWPCA diffuser to reflect more recently collected site-specific data (discussed in Section 4.3.1.3 and summarized in **Table 4.3-1**).
- Include detailed computations of the internal flow hydraulics of the diffuser to address the variation in flow along the diffuser outfall pipe and the subsequent effect on dilution.
- Update the Semi-Empirical Analysis (SEA) to use the Cederwall formula and provide validation of the applicability of Visual Plumes (VP) modeling methodologies for dense negatively buoyant discharge plumes (discussed in detail in Section 4 of **Appendix D1**).
- Update the analysis of plume dynamics and dilution for positively buoyant discharge plumes using two mathematical models within the US EPA model suite Visual Plumes: UM3 (described above) and NRFIELD. NRFIELD is specifically designed for conditions typical of very buoyant discharges of domestic effluent from multiport diffusers into stratified oceanic waters (discussed in detail in Section 5 of **Appendix D1**).
- Compute salinity within the BMZ (328 feet from point of discharge, as required by the Ocean Plan) and at its boundary for dense negatively buoyant discharges.
- Compute minimum dilution and plume behavior for positively buoyant discharges utilizing the site specific oceanic density stratification data.
- Estimate regions within the BMZ where salinity would exceed 2 ppt above background salinity.

To revise the near-field brine discharge model analysis completed by Flow Science, Inc. (2014, see Appendix D2), Roberts (2017, see Appendix D1) combined the updated and site-specific environmental baseline conditions from **Table 4.3-1**, the updated discharge flows from the scenarios summarized in **Table 4.3-10**, and the effluent water quality characteristics of the brine and the MRWPCA wastewater and hauled brine (**Table 4.3-11**) to calculate flow, salinity, and density for all possible flow scenarios (**Table 4.3-12**, discussed in detail below). The values calculated for flow, salinity, and density for all possible discharge scenarios were then utilized for the near-field brine discharge model analysis to compute minimum dilution ratios (Dm) at the edge of the ZID, estimate the gradient of salinity between the diffuser ports and the edge of the ZID, and calculate the salinity beyond the ZID but within the regulatory mixing zone (BMZ). These results are presented below.

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[33] Dr. Philip J. Roberts has extensive international experience in marine wastewater disposal including the design of ocean outfalls and numerical modeling. Dr. Roberts’ mathematical models and methods have been adopted by the USEPA and are widely used around the world.

TABLE 4.3-11
EFFLUENT WATER QUALITY CHARACTERISTICS ASSUMED FOR ALL MODELED SCENARIOS

Constituent	Temperature (°C)	Salinity (ppt)	Density (kg/m^3)
Secondary effluent	20.0	0.80	998.8
Brine	9.9	58.23	1045.2
Hauled brine	20.0	40.00	1028.6

Dense Operational Discharges - Salinity Impact Analysis

Presented here is an assessment of effects on receiving water salinity levels for operational discharges that are denser than the ambient receiving sea water. Sinking plumes have substantially lower initial dilution from turbulent mixing than positively buoyant, or rising, plumes (i.e., discharges with densities less than the receiving seawater). As such, the evaluation of potential salinity impacts from MPWSP operational discharges focuses in this section on negatively buoyant discharges.

As discussed in Section 4.3.4, Approach to Analysis, the potential water quality impact resulting from the brine-only and combined discharges was analyzed for the near field (the immediate vicinity of the diffuser port upon discharge) and beyond (the edge of the BMZ as the plume travels away from the diffuser port). The near-field analysis for salinity was based on modeling conducted within the mixing zone (i.e., the ZID). Of the assessed discharge scenarios (**Table 4.3-10**), discharges of brine only, Scenario 2, or low volumes of wastewater, Scenarios 3 through 12 (typical operations) and 15 through 26 (temporary post-shutdown operations) were determined to be dense (i.e., with salinity levels in excess of ambient conditions and thus negatively buoyant). When the MPWSP brine is combined with high volumes of wastewater (Scenarios 13, 14, 27, and 28), the plume is positively buoyant because the salinity of the effluent is substantially lower than that of ambient conditions (**Table 4.3-11** and **Table 4.3-12**). Dilution values and plume dynamics for the positively buoyant plumes (operational discharges during the non-irrigation months) are further discussed below under Buoyant Discharge Model Results and Discussion.

A typical jet trajectory output from Visual Plumes (for the pure brine case, Scenario 2, **Table 4.3-10**) is shown in **Figure 4.3-6**. In the case of Scenario 2, the centerline of the plume discharged from each of the 129 diffuser jets makes contact with the seabed approximately 10 ft from the nozzle (with a plume diameter of approximately 5 ft). Similar simulations were run for all discharge scenarios for which the operational discharge plume was dense and negatively buoyant. Additionally, simulations were run using the SEA method for redundancy and validation. The results of salinity predictions and minimum dilution values for each discharge scenario are summarized in **Table 4.3-13**. The distance from each diffuser port at which the dense discharge plume makes contact with the seabed (from the VP model) is also shown in **Table 4.3-13** for all dense discharge scenarios. The distance between the diffuser port and the point where the plume contacts the seabed can be interpreted as the ZID, with the point of contact with the seabed representing the edge of the ZID.

TABLE 4.3-12
OPERATIONAL DISCHARGE FLOW, SALINITY, AND DENSITY

Scenario No.	Discharge Scenario	Combined effluent		
		Flow (mgd)	Salinity (ppt)[1]	Density (kg/m3)
Typical Discharge Scenarios				
1	SE Only	19.88	1.00	999.0
2	Brine only	14.08	58.10	1045.1
3	Brine + Low (1) SE	15.08	54.30	1042.0
4	Brine + Low (2) SE	16.08	50.97	1039.4
5	Brine + Low (3) SE	17.08	48.04	1037.0
6	Brine + Low (4) SE	18.08	45.42	1034.9
7	Brine + Moderate (5) SE	19.08	43.08	1033.0
8	Brine + Moderate (6) SE	20.08	40.98	1031.3
9	Brine + Moderate (7) SE	21.08	39.07	1029.7
10	Brine + Moderate (8) SE	22.08	37.34	1028.3
11	Brine + Moderate (9) SE	23.08	35.76	1027.1
12	Brine + High (10) SE	24.08	34.30	1025.9
13	Brine + High (15) SE	29.08	28.54	1021.2
14	Brine + High (19.78) SE	33.86	24.63	1018.1
High Brine Discharge Scenarios (post-shutdown operations)				
15	High Brine only	16.41	58.12	1045.1
16	High Brine + Low (1) SE	17.41	54.83	1042.5
17	High Brine + Low (2) SE	18.41	51.89	1040.1
18	High Brine + Low (3) SE	19.41	49.26	1038.0
19	High Brine + Low (4) SE	20.41	46.89	1036.1
20	High Brine + Moderate (5) SE	21.41	44.73	1034.3
21	High Brine + Moderate (6) SE	22.31	42.78	1032.7
22	High Brine + Moderate (7) SE	23.31	40.98	1031.3
23	High Brine + Moderate (8) SE	24.31	39.33	1030.0
24	High Brine + Moderate (9) SE	25.31	37.81	1028.7
25	High Brine + High (10) SE	26.31	36.40	1027.6
26	High Brine + High (12) SE	28.31	33.89	1025.6
27	High Brine + High (14) SE	30.31	31.70	1023.8
28	High Brine + High (16) SE	32.31	29.79	1022.2

NOTES: SE = Secondary Effluent (MRWPCA wastewater)

1 Unit used to measure salinity in terms of the concentration of dissolved salts in water. Equivalent to practical salinity units (PSU).

SOURCE: Roberts, 2017 (Appendix D1).

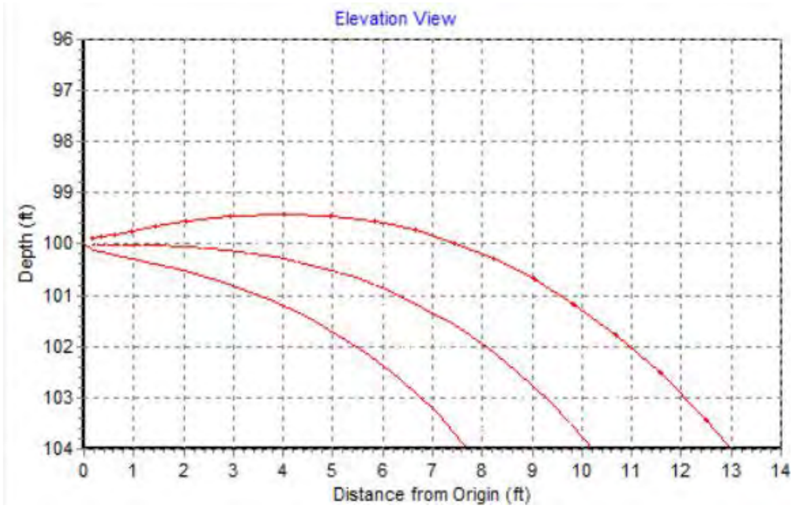


Figure 4.3-6
Typical Graphics Output of Jet Trajectory
from VP Method: Brine Only Discharge (Scenario 2)

The dilution predictions from the VP and SEA model analysis methods presented in **Table 4.3-13** are consistent, providing validation for the model results. The worst case for typical operations, as expected, is the pure brine discharge scenario during the irrigation season (Scenario 2). For Scenario 2, the minimum dilution at the plume centerline is 1:15.4 (effluent : seawater) and the salinity increment above ambient at the edge of the ZID, located approximately 10 feet from the diffuser port, is 1.61 ppt. In all cases, the Ocean Plan salinity limit of 2 ppt is met at the edge of the ZID, the length of which ranges from approximately 10 to 39 feet for the dense discharge scenarios (**Figure 4.3-7**), well within the Ocean Plan receiving water limitation for salinity of 2 ppt at a distance of 328 feet from the diffuser (the BMZ). Therefore, for all discharge scenarios, the Ocean Plan water quality standard for salinity is met. Further, the standard is demonstrated to be met at a maximum distance from the diffuser (33 feet for typical operations, 39 feet for post-shutdown operations) which is much smaller than that allowed under the Ocean Plan (328 feet).

The subsequent increase in dilution from the edge of the ZID to the edge of the BMZ cannot be predicted using model analysis as no experimental data are available for these horizontal dense jet flows. Roberts (2016, 2017) conservatively calculates the increase in dilution of the dense discharges up to the edge of the BMZ using guidance obtained from experiments on buoyant jets and inclined dense jets which estimate dilution increases of between 60 percent and 22 percent, respectively, for non-merging and merging plumes. Because the diameters of individual discharge jets from the diffuser ports are generally much smaller than the port spacing of 16 ft, the plumes are not expected to merge before impacting the sea floor (**Figure 4.3-8**), thus allowing for maximum dilution at each diffuser port (Roberts, 2016; Geosyntec, 2015). As the dense discharge plumes from the diffuser jets contact the seabed, they would continue to dilute and ultimately merge beyond the edge of the ZID. For this analysis, it was conservatively assumed that the dense discharge plumes from the diffuser jets will merge within the BMZ and that the increase in dilution from the edge of the ZID to the BMZ would be 20 percent (see Appendix D1 for details). This increase was

TABLE 4.3-13
DILUTION MODEL RESULTS FOR DENSE DISCHARGE SCENARIOS

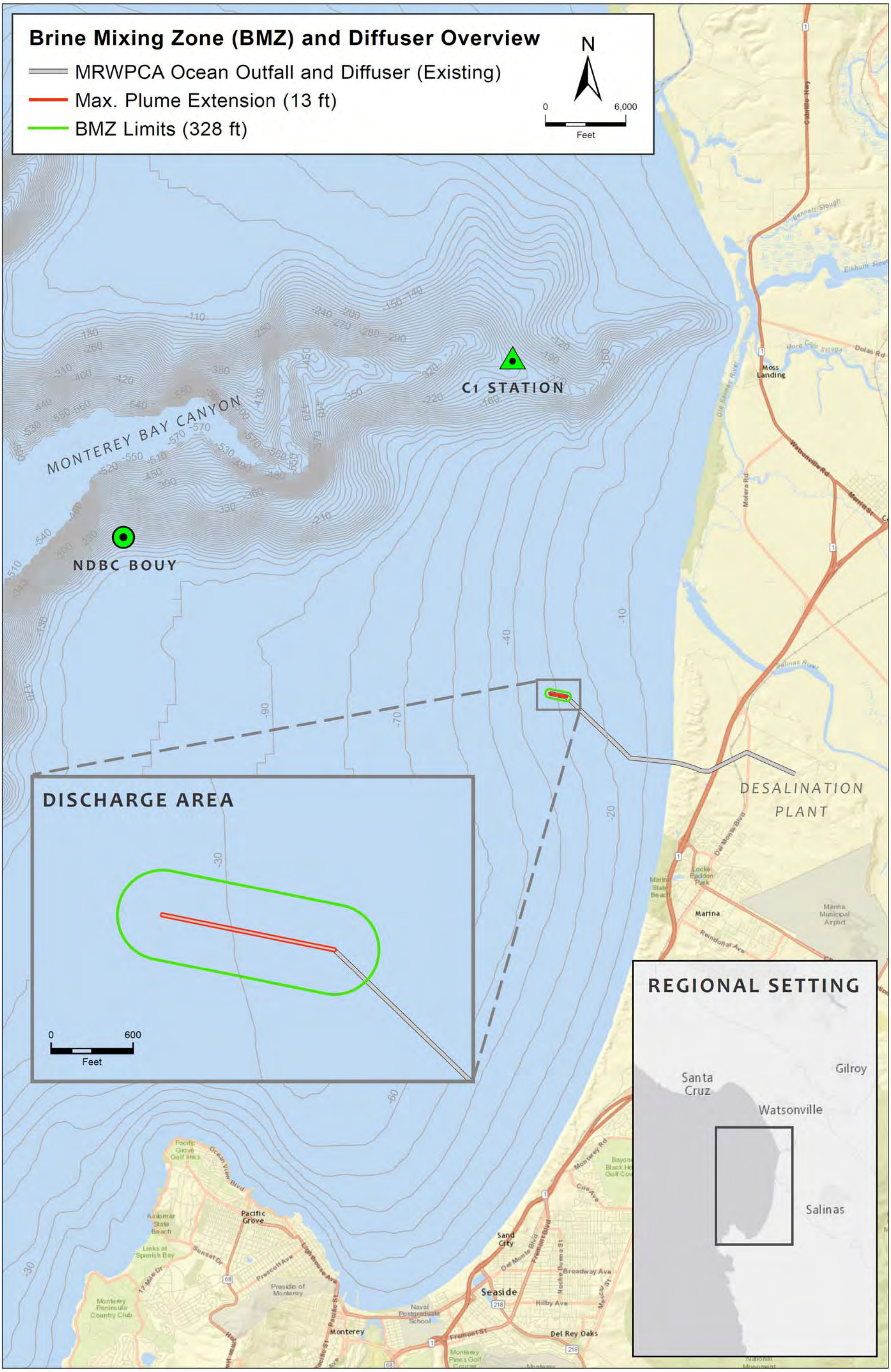
Scenario No.	Scenario	Predictions			At impact (ZID)		At BMZ	
		SEA	VP					
		Dilution	Dilution	Distance (ft)	Dilution[a]	Salinity increment (ppt)	Dilution	Salinity increment (ppt)
Typical Discharge Scenarios								
1	SE Only	-	-	-	-	-	-	-
2	Brine only	15.4	16.2	10.2	15.4	1.61	18.5	1.34
3	Brine + Low (1) SE	16.0	16.1	10.4	16.0	1.31	19.2	1.09
4	Brine + Low (2) SE	16.8	17.6	11.6	16.8	1.05	20.1	0.88
5	Brine + Low (3) SE	17.7	18.5	12.7	17.7	0.83	21.2	0.69
6	Brine + Low (4) SE	18.8	19.5	13.8	18.8	0.64	22.5	0.54
7	Brine + Mod (5) SE	20.1	20.9	15.3	20.1	0.48	24.2	0.40
8	Brine + Mod (6) SE	21.9	22.2	16.8	21.9	0.35	26.3	0.29
9	Brine + Mod (7) SE	24.8	24.9	19.2	24.8	0.23	29.7	0.19
10	Brine + Mod (8) SE	28.2	27.5	21.9	27.5	0.15	33.0	0.12
11	Brine + Mod (9) SE	34.2	27.7	22.3	27.7	0.09	33.2	0.07
12	Brine + High (10) SE	46.7	39.2	33.0	39.2	0.02	47.0	0.02
13	Brine + High (15) SE	-	-	-	-	-	-	-
14	Brine + High (19.78) SE	-	-	-	-	-	-	-
High Brine Discharge Scenarios (post-shutdown operations)								
15	High Brine only	15.5	16.3	10.5	15.5	1.60	18.6	1.33
16	High Brine + Low (1) SE	16.1	16.9	11.3	16.1	1.34	19.3	1.11
17	High Brine + Low (2) SE	16.7	17.5	12.1	16.7	1.11	20.1	0.92
18	High Brine + Low (3) SE	17.5	18.4	13.1	17.5	0.91	21.0	0.76
19	High Brine + Low (4) SE	18.6	19.3	14.2	18.6	0.73	22.3	0.61
20	High Brine + Mod (5) SE	19.6	20.4	15.4	19.6	0.58	23.6	0.48
21	High Brine + Mod (6) SE	22.1	21.4	16.6	21.4	0.42	25.7	0.35
22	High Brine + Mod (7) SE	22.8	22.8	18.1	22.8	0.34	27.4	0.28
23	High Brine + Mod (8) SE	25.0	24.5	19.8	24.5	0.24	29.4	0.20
24	High Brine + Mod (9) SE	28.2	27.2	22.3	27.2	0.16	32.6	0.14
25	High Brine + High (10) SE	32.5	30.2	25.3	30.2	0.10	36.2	0.08
26	High Brine + High (12) SE	58.6	44.9	39.0	44.9	0.01	53.9	0.01
27	High Brine + High (14) SE	-	-	-	-	-	-	-
28	High Brine + High (16) SE	-	-	-	-	-	-	-

NOTES:

[a] The lowest dilution value was selected from the two model (SEA and VP) analysis results to calculate incremental salinity increases at the edge of the ZID and BMZ to provide the most conservative assessment of potential salinity increases.

SE = Secondary Effluent (MRWPCA wastewater)

SOURCE: Roberts, 2017 (Appendix D1).



Basemap Sources: ESRI, USGS

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Figure 4.3-7

Brine Mixing Zone (BMZ) and Diffuser Overview

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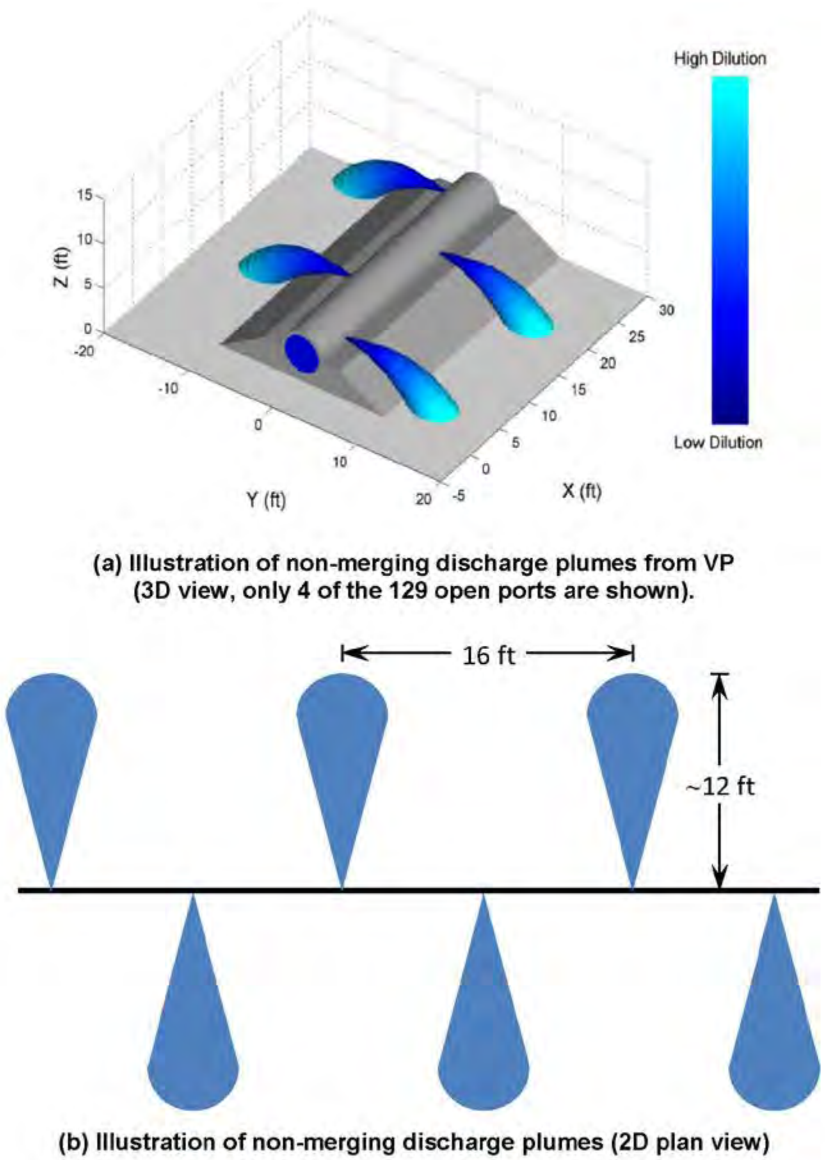


Figure 4.3-8
Non-merging Dense Discharge Plumes
from Diffuser Ports (near field)

used to predict the BMZ dilutions and incremental salinity above baseline conditions for each dense discharge scenario, as shown in **Table 4.3-13**. It is expected that dilution would actually be much greater than the assumed 20 percent (Roberts, 2016). As discussed above, the worst case for typical operations is Scenario 2, the pure brine discharge scenario during irrigation months. For Scenario 2, the incremental increase in salinity above background conditions at the edge of the BMZ was conservatively calculated to be 1.34 ppt, which is below the Ocean Plan salinity limit of 2 ppt. Scenarios 3, 4, and 5 have incremental salinities at the edge of the BMZ of 1.09, 0.88, and 0.69 respectively, demonstrating incremental salinity reductions as increasing wastewater flows are combined with the brine.

When brine discharges are increased following a shutdown, the minimum dilution ratios of brine to seawater and associated incremental salinity increases would not be substantially altered as compared to typical operations (**Table 4.3-13**). For example, when the densest discharges of brine only (most conservative scenarios with lowest minimum dilution values) are compared for typical operations (13.98 mgd of brine) and for post-shutdown operations (16.31 mgd of brine), the minimum dilution achieved at the edge of the ZID and BMZ are not measurably different in regards to incremental salinity. For typical operations, minimum dilution at the edge of the ZID and BMZ would be 15.4 and 18.5, respectively, with associated incremental salinity increases of 1.61 ppt and 1.34 ppt. When the same values are compared for post-shutdown operations, the minimum dilution at the edge of the ZID and BMZ would be 15.5 and 18.6, respectively, with associated incremental salinity increases of 1.60 ppt and 1.33 ppt above ambient. Overall, the minimum dilution results and increases above ambient salinity are very similar for all discharge scenarios for both typical and post-shutdown operations. This is due, in part, to the diffuser ports being fitted with duckbill valves that change in diameter as flows increase or decrease.

The model results are conservative. The dilution calculations presented above assume that discharges are made from round nozzles whose area is the same as the effective opening of the check valves (described under Operational Discharge Scenarios Modeled and Assessed, above). No existing models predict the dilution from elliptically-shaped check valves, but experiments show that the centerline dilutions from elliptical nozzles are greater than from equivalent round nozzles due to the larger surface area available for entrainment (see **Appendix D1** for details). Furthermore, the computed salinities presented in **Table 4.3-13** occur only along the seabed. Salinities decrease with height in the water column and would be above ambient only near to the seabed. For most of the water column, incremental salinities would be much less than the conservative values shown in **Table 4.3-13**. Finally, the model conservatively assumed no additional mixing of the discharge would occur as a result of tidal or wave related currents.

Operational discharges from the MPWSP would not violate water quality standards or waste discharge requirements or otherwise substantially degrade the water quality of receiving waters in Monterey Bay by increasing salinity levels. Therefore, this impact would be less than significant.

Dense Operational Discharges - Areas Exceeding 2 ppt Salinity

Consistent with Ocean Plan requirements, the analysis presented in this section evaluates the plume dynamics of dense, negatively buoyant operational discharges to quantify areas where salinity would exceed 2 ppt above natural background salinity around the outfall diffuser. Areas determined to exceed 2 ppt above natural background salinity are considered further in Section 4.5, Marine Biological Resources, in the context of assessing and quantifying the potential for mortality of aquatic wildlife and loss of habitat from operational discharges as well as the potential for operational discharges to injure sanctuary resources. While no significance threshold or regulatory standard exists for the exceedance of 2 ppt salinity within the BMZ related to water quality, the following assessment is presented to further support the assessment of impacts on marine biological resources within the BMZ from operational discharges (see Section 4.5, Marine Biological Resources). Additionally, the assessment and disclosure of areas exceeding 2 ppt salinity is required by the Ocean Plan and MBNMS guidelines for desalination facilities (MBNMS, 2010). For dense discharges around the outfall diffuser, exceedances of the 2-ppt salinity threshold would be restricted to small areas adjacent to the diffuser ports. To estimate the area around the diffuser ports where salinities could exceed 2 ppt, Roberts (2016) presents three-dimensional, laser-induced fluorescence (3DLIF) images of a horizontal, negatively buoyant jet representative of those assessed in this impact analysis (**Figure 4.3-9**; see **Appendix D1** for additional details). The images were obtained by scanning a laser sheet horizontally through the dense discharge flow, to which a small amount of fluorescent dye was added. The fluoresced light was captured and converted to tracer concentrations and dilution and imaged by computer graphics techniques. The image in **Figure 4.3-9** shows the outer surface of a dense discharge plume as semi-transparent, with concentrations depicted in various colors through the jet centerline. High salinity concentrations (i.e., exceeding 2 ppt) would be confined to a relatively small area (by water volume) adjacent to the diffuser port and would attenuate rapidly with distance from the nozzle. Using **Figure 4.3-9** to represent a negatively buoyant plume similar to those assessed in this analysis and scaling up to be consistent with the proposed project, the region of a salinity exceeding 2 ppt threshold would be represented by the area contained within the first three color contours (red, orange, and yellow contours). **Figure 4.3-10** presents a graphical output from Visual Plumes UM3 model (described above) for Scenario 2 (brine only discharge, the worst case scenario for salinity increases). Visual Plumes computes a constant salinity contour (blue line) representing a salinity increment of 2 ppt; within this contour, the salinity increment is greater than 2 ppt, and outside this line it is less than 2 ppt. The area where salinity exceeds the 2 ppt threshold under the worst case scenario (brine only) around each of the 129 outfall diffuser jets is a conical area with a volume on the order of 8.5 cubic feet (approximately 8 feet long by 2 feet in diameter), located approximately 2 feet above the sea floor (**Figure 4.3-10**). As discussed above, the brine plumes do not merge prior to contacting the sea floor, and so there would not be a contiguous area around the diffuser where salinity exceeds the 2 ppt salinity threshold. When the brine plume for Scenario 2 contacts the sea floor, the salinity would be 1.56 ppt above ambient (Table 4.3-13) and would pose no risk for the occurrence of hypoxia. For all discharge scenarios, the discharge plume contacts the sea floor and is less than 2 ppt above ambient at a distance ranging from 10 feet to 33 feet from the outfall diffuser for typical operations, representing an area of the sea floor of 0.6 to 1.8 acres respectively (for context the total area within the BMZ represents a sea floor area of 27 acres). For additional discussion of the areas exceeding 2 ppt salinity levels in the context of potential impacts on marine organisms and sanctuary resources, see Section 4.5, Marine Biological Resources.

Dense Operational Discharges - Additional Considerations

This impact analysis addresses concerns raised during the public review of the April 2015 DEIR. The comments received involved the brine discharge and its travel path beyond the BMZ, concerns relating to the propagation of a dense saline plume along the sea floor, and the potential for hypoxia to occur near the seabed as a result of extremely elevated salinity levels adjacent to the outfall diffuser. Each of these concerns is addressed briefly below.

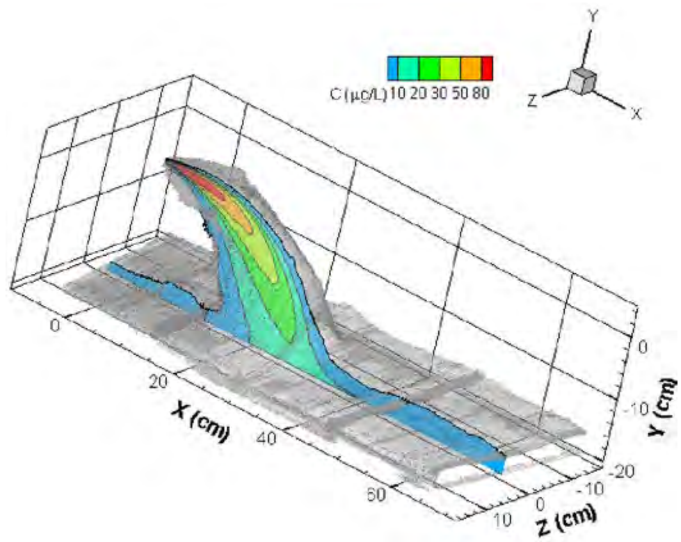
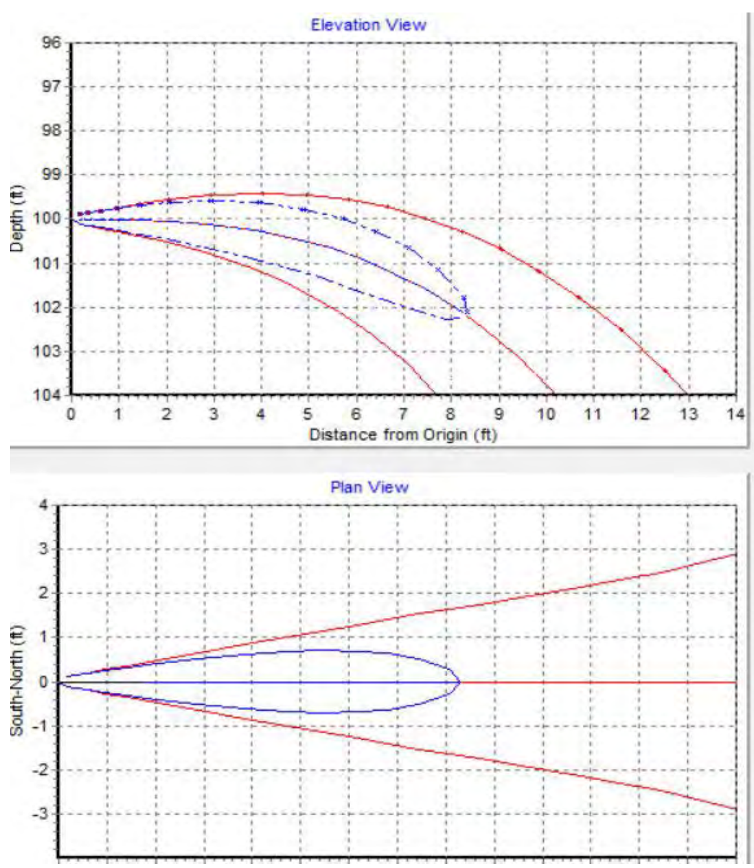


Figure 4.3-9
3DLIF Image of a Laboratory-generated Generic Horizontal Dense Jet



NOTES: Red line is the outer boundary of the jet. Blue line is contour of 2 ppt salinity increment.
SOURCE: Roberts, 2016

Figure 4.3-10
UM3 Graphical Output for Scenario 2 (pure brine at 13.98 mgd)

While there are no significance thresholds for salinity limitations beyond the BMZ boundary (328 ft), as discussed above, operational discharges would be less than 2 ppt above ambient salinity levels at the edge of the ZID, which ranges between 10 and 33 feet from the diffuser depending on discharge scenario (and up to 39 feet for temporary post-shutdown operations). Further, the model analysis presented in **Appendix D1** demonstrates that, as the brine plume travels away from the point of discharge, salinity levels associated with the discharge would progressively decrease with time and distance from the point of discharge, approaching background salinity levels beyond the BMZ through dispersion and dilution with the ocean currents.

Mixing and dilution of horizontal dense plumes from the diffuser jets could be affected by proximity to a local boundary, such as the sea floor (Roberts, 2016). As a fluid moves across a surface a certain amount of friction occurs between the fluid and the surface, which tends to slow the moving fluid. This resistance to the flow of the fluid pulls the fluid towards the surface. Thus, a fluid emerging from a nozzle (such as a dense plume from a diffuser) could potentially follow a nearby curved surface (such as the sea floor) if the curvature of the surface, or the angle the surface makes with the fluid stream, is not too sharp (i.e., acute). This effect (known as Coanda attachment), could result in substantially reduced dilution, or as public commenters suggested, result in creating a dense saline plume that forms a connection to and travels along the sea floor. In response to this concern, Roberts (2016) modeled the anticipated discharge to see if this effect was likely to occur. He determined that conditions of the discharge, namely, the expected negatively buoyant, density characteristics, were not likely to result in a Coanda effect of plume attachment to the sea floor (for details regarding methods and results see **Appendix D1**). Based on published research in the scientific literature on plume experiments relevant to desalination outfall facilities, a Coanda attachment to the sea floor will not occur for a negatively buoyant dense discharge when the parameter "z_o/dF" is greater than 0.12[34] (**Table 7** of **Appendix D**). The parameter "z_o/dF" represents a function of the internal hydraulics of the outfall and diffuser ports and was modeled as part of the dilution analyses described in **Appendix D**. Roberts (2016) concluded that, because "z_o/dF" is substantially greater than 0.12 for all discharge scenarios involving a dense negatively buoyant plume, a Coanda attachment would not occur, and that there would be no significant impairment to the dynamics or mixing of the discharges with receiving waters.

Comments received on the April 2015 DEIR expressed concerns over the potential for areas of hypoxia to form beneath dense discharges. Adequate DO is vital for aquatic life and higher concentrations are generally considered to be desirable. Dissolved oxygen content in water is, in part, a function of water temperature and salinity, which affect the point at which water becomes saturated with DO. As described in Section 4.3.1.3, the ability of oxygen to dissolve in water decreases as the temperature and salinity of water increases. As the temperature and/or salinity of water increases, water loses the ability to hold dissolved oxygen and the concentration goes down. Salinity also has properties that can facilitate the creation of hypoxic[35] zones. Because salt water is more dense than fresh water, under certain conditions, a less dense layer of fresh or low

34 Table 7 of Appendix D1 (Roberts, 2017) includes the model results for calculation of the internal hydraulics of the outfall and diffuser ports under "Port Conditions" used as part of the dilution analyses.
35 Hypoxia occurs when the amount of dissolved oxygen in water becomes too low to support most aquatic life (typically below 2 mg/l).

salinity water can form on top of a denser layer of high salinity water. Such a scenario can prevent adequate mixing of the water column and prevent oxygenated water to get to the lower depths resulting in the heavier, saltier layer at the bottom to become oxygen-depleted.

However, DO varies per many other factors, including photosynthesis and biological and chemical oxygen demand associated with decomposition of organic material. Monterey Bay is a dynamic environment that includes variable concentrations of DO. Ambient DO levels in Monterey Bay at a depth of approximately 100 feet have ranged from 4.25 milligrams per liter (mg/L) to 8.00 mg/L (KLI, 1998; KLI, 1999); typically, DO in the range of 5 to 8 mg/L is considered protective of fish and marine biota depending on the species and life-stage. Under the Ocean Plan, a discharge may not increase DO more than 10 percent of ambient levels at the edge of the BMZ.

Comments specifically expressed concern that, due to sediment oxygen demand and potential limited mixing due to dense discharges forming Coanda attachments, limited dilution and mixing could restrict oxygen supply. As described above, Coanda attachments would not occur, and modeled salinity levels are less than 2 ppt above ambient salinity at the edge of the ZID. Further, to evaluate the potential for hypoxia, Geosyntec (2015) performed a mass-balance analysis (a mass-balance analysis accounts for a given material entering and leaving a system) based on dilution and dispersion analyses for operational discharges completed by ESA (ESA, 2015). The analysis applied a mass-balance approach to a conservative areal extent of a brine-only plume (i.e., the most dense of the proposed operational discharges) to derive estimates of oxygen demand in local sediments (70 to 180 kilograms/day) and estimates of oxygen supplied (less than 5,600 kilograms/day) by the operational discharges (including entrained seawater). Based on the results of the mass-balance analysis, the amount of oxygen supplied to the discharged plume by ambient seawater entrained during turbulent mixing and dilution is more than 30 times greater than that consumed by the sediments. As such the concentration of dissolved oxygen in receiving ocean waters would not become depressed by more than 10 percent from that which occurs naturally, hypoxia is unlikely to occur as a result of proposed operational discharges and impacts would be less than significant.

Buoyant Operational Discharges - Analysis and Discussion

The analysis presented in this section evaluates positively buoyant operational discharges (i.e., that have densities less than the receiving seawater) using model analyses to determine salinity, dilutions, and plume behavior.

Positively buoyant discharge plumes (i.e., those with densities less than the receiving water) require different analytical procedures than are used for negatively buoyant plumes. Only five discharge scenarios involve a positively buoyant discharge: Scenario 1, the baseline consisting only of MRWPCA wastewater and Scenarios 13, 14, 27, and 28, MPWSP brine combined with high flows of wastewater during the non-irrigation season (**Table 4.3-10** and **Table 4.3-13**). The plume dynamics for these scenarios were simulated with two models in Visual Plumes: UM3 and NRFIELD (**Appendix D1**). UM3 is an entrainment model that was previously described above. NRFIELD is based on experiments on multiport diffusers discharging from two sides (Roberts, 2016). NRFIELD is specifically designed for conditions typical of very buoyant discharges of domestic effluent from multiport diffusers into stratified oceanic waters, and as such, is considered applicable to this analysis. The primary outputs from NRFIELD are the minimum (centerline) dilution, the plume rise height, and thickness at the end of the near field.

The following procedure was used for the buoyant plume dilution simulations. The internal hydraulics of the outfall diffuser were computed for each of the discharge scenarios (described in detail in **Appendix D1**) and the average port diameter and flows were obtained for each diffuser port. The UM3 and NRFIELD model suites in Visual Plumes were then run for each oceanic season: Upwelling, Davidson, and Oceanic. The seasonal average density stratifications (**Table 4.3-1**) were used, and zero current speed was conservatively assumed.

The results are summarized in **Table 4.3-14**. For UM3, the average dilutions at the terminal rise height are given along with the centerline rise heights of the plume; for NRFIELD, the near field (minimum) dilution is given along with the height of the near field (centerline) dilution and the height to the top of the spreading plume. The average dilution predicted by UM3 is very close to the minimum (centerline) dilution predicted by NRFIELD. The reason for this is that the increase in mixing and dilution in the transition from vertical to horizontal flow and merging of the plumes from both sides, neither of which are incorporated into UM3, are accounted for in the ratio of average to the minimum dilutions (Roberts, 2017). Therefore, while the average dilution predicted by UM3 is presented as a model output, it is interpreted here as the minimum centerline dilution (see **Appendix D1** for details). The near field dilution is synonymous with the minimum initial dilution in the ZID, as defined in the California Ocean Plan.

However, the results for UM3 and NRFIELD diverge as the effluent becomes only slightly buoyant (i.e. the effluent density approaches the ambient density), with UM3 dilutions being considerably higher. NRFIELD is based on experiments conducted for parameters typical of domestic wastewater discharges into coastal waters and estuaries. For this situation, dilution and mixing are mainly dependent on the source buoyancy flux with momentum flux playing a minor role. NRFIELD is the preferred model for this case. As the effluent density approaches the background density, buoyancy becomes less important and the mixing becomes dominated by momentum. UM3 is the preferred model for this case. In that situation, NRFIELD continues to give predictions but issues a warning that "The results are extrapolated" when the parameters are outside the range of the original experiments. Therefore, the NRFIELD results were utilized in the impact assessment when the results are within the experimental range, and UM3 when extrapolated.

The model output showed that the dilutions of project-related discharges would be high for all of the buoyant plume scenarios evaluated. The lowest is a minimum initial dilution of 88 for Scenario 7. The highest dilution was 349 for Scenario 1 (pure secondary effluent) during the Davidson season. As demonstrated by model analysis, when the MPWSP brine is combined with high volumes of wastewater, the plume is positively buoyant because the salinity of the effluent is substantially lower than that of ambient conditions (**Table 4.3-12**). Operational discharges that are buoyant would not exceed the significance threshold of 2 ppt at the BMZ; the salinity of the buoyant discharges is already lower than that of the receiving waters, and impacts would be less than significant.

TABLE 4.3-14
DILUTION RESULTS FOR BUOYANT DISCHARGE SCENARIOS

Scenario No.	Scenario	Season	Effluent conditions			UM3 simulations		NRFIELD simulations		
			Flow (mgd)	Salinity (ppt)	Density (kg/m^3)	Average dilution	Rise height (centerline) (ft)	Minimum dilution	Rise height (centerline) (ft)	Rise height (top) (ft)
1	SE Only	Upwelling	19.88	1.00	999.0	-	-	179	41	57
		Davidson				-	-	349	100	100
		Oceanic				-	-	238	50	72
13	Brine + High SE (15 mgd)	Upwelling	29.08	28.54	1021.2	93	28	-	-	-
		Davidson				127	57	-	-	-
		Oceanic				94	27	-	-	-
14	Brine + High SE (19.78 mgd)	Upwelling	33.86	24.63	1018.1	99	36	-	-	-
		Davidson				147	76	-	-	-
		Oceanic				104	41	-	-	-
27	High Brine + High SE (14 mgd)	Upwelling	30.31	31.70	1023.8	88	19	-	-	-
		Davidson				120	45	-	-	-
		Oceanic				90	17	-	-	-
28	High Brine + High SE (16 mgd)	Upwelling	32.31	29.79	1022.2	90	26	-	-	-
		Davidson				118	53	-	-	-
		Oceanic				88	23	-	-	-

NOTES:
SE = Secondary Effluent (MRWPCA wastewater)

SOURCE: Roberts, 2017 (Appendix D1).

Impact Summary and Conclusion

The analysis of salinity levels indicates that for all scenarios, and assuming a continuous discharge stream, the MPWSP brine only discharges and discharges of brine combined with varying amounts of waste water will meet Ocean Plan salinity and dissolved oxygen standards and will not result in hypoxia on the ocean floor. Specifically, the discharges would result in salinity levels that would not exceed 2 ppt above ambient salinity at the edge of the ZID (the edge of which is 10 feet to 39 feet from the diffuser depending on discharge scenario), which means that salinity levels would not exceed 2 ppt above ambient salinity at the edge of the BMZ (328 ft from the diffuser) since the edge of the ZID is well within the BMZ under all scenarios. The proposed action would therefore not exceed or violate the Ocean Plan salinity standards or degrade water quality in terms of salinity.

As the plumes discharged from each of the 129 outfall diffuser jets travel away from the ZID, they continue to dilute (further reducing salinity levels) and ultimately merge within the BMZ boundary. Salinity levels would exceed 2 ppt in a relatively small area, approximately 8.5 cubic feet, adjacent to each of the 129 diffuser ports in an area 2 feet above the sea floor, after which the discharge plumes would attenuate rapidly with distance from each port. The combined area of exceedances of 2 ppt is not likely to adversely impact the marine environment because it is a relatively small volume in the water column when considered in the context of the total volumes of Monterey Bay. Also, the salinity increases presented in the analysis represent conservative values and would occur only along the seabed. Modeling demonstrates that salinity plumes are not likely to travel, or become trapped, along the sea floor due to the Coanda effect. Hypoxia from salinity near the sea floor was determined to be unlikely based on a mass-balance analysis, which demonstrated that the amount of oxygen supplied to the discharged plume by ambient seawater entrained during turbulent mixing and dilution is more than 30 times greater than that consumed by the sediments. As such, the concentration of dissolved oxygen in receiving ocean waters would not become depressed by more than 10 percent from that which occurs naturally under baseline conditions. For the majority of the water column, incremental salinities would be much lower than the reported values. Additionally, the analysis assumed zero ocean current; however, under actual ocean conditions, waves, tidal forces, and seasonal currents would increase mixing and dilution, thus reducing these assessed salinity levels. Therefore, operational discharges from the MPWSP would not increase salinity levels or impact DO in a manner that violates water quality standards or waste discharge requirements or otherwise degrades the water quality of receiving waters in Monterey Bay and MBNMS. Environmental impacts and impacts on MBNMS resources would be less than significant.

The current NPDES permit (Order No. R3-2014-0013, NPDES Permit No. CA0048551), which regulates the wastewater discharge from the outfall, would be amended before the MPWSP Desalination Plant begins operation to incorporate the brine-only and combined discharges. Under the amended NPDES permit, the discharges would be subject to the Ocean Plan water quality objectives, which would be incorporated into the permit in the form of specific effluent limitations as water quality requirements. Further, the amended NPDES permit would require approval by MBNMS to ensure discharges would not impair or degrade the resources of the Sanctuary.

As described in Section 4.3.2.2, the Ocean Plan includes monitoring and reporting requirements for the operation of new desalination facilities (Section III.M.4, "Monitoring and Reporting Program"; SWRCB, 2016). The monitoring requirements for the operation of a new desalination facility are such that the owner or operator of a desalination facility must submit a Monitoring and Reporting Plan to the RWQCB for approval. The Monitoring and Reporting Plan must include provisions for monitoring of effluent and receiving water characteristics and impacts on all forms of marine life. The Monitoring and Reporting Plan must, at a minimum, include monitoring for benthic community health, aquatic life toxicity, hypoxia, and receiving water characteristics. Additionally, receiving water monitoring for salinity must be conducted at times when the monitoring locations detailed in the Monitoring and Reporting Plan are most likely affected by the discharge. Additionally, as described in Section 4.3.2.2, MBNMS has established non-regulatory guidelines (MBNMS, 2010) for the construction and operation of desalination facilities to ensure that desalination plants in the sanctuary would be sited, designed, and operated in a manner that results in minimal impacts on the marine environment. The proposed project is substantially consistent with the guidelines relating to operational discharges regarding water quality and salinity. However, the guidelines also specify that a monitoring program should be developed to evaluate the extent of impacts from the plant's discharge operations on marine resources. The guidelines for developing a monitoring program are largely consistent with those described for the Ocean Plan with the addition that any proposed mitigation should be monitored for unavoidable impacts to ensure the mitigation is performing as intended.

A monitoring and reporting plan, consistent with the Ocean Plan requirements and MBNMS Guidelines for operation of a new desalination facility, has not been defined and proposed as part of the project. Several of the parties to the CPUC proceeding have agreed upon terms of the brine discharge that establishes, in part, a detailed monitoring and reporting program that includes the collection of relevant, long-term water quality data. The intent of the monitoring program is to determine compliance with defined water quality standards and to implement specific corrective actions when non-compliance is determined to occur. While the monitoring plan defined by the settling parties is consistent with portions of the Ocean Plan (SWRCB 2016) requirements and the MBNMS Desalination Guidelines (MBNMS 2010), it does not include biological monitoring to determine impacts on marine life. Further, while the Ocean Plan requires implementation of a monitoring plan for operation of a desalination facility, the requirement is new and, as such, is not well tested. Additionally, the monitoring requirements defined in the Ocean Plan are broadly described and do not include specific thresholds, performance standards, or corrective actions.

While impacts related to water quality from increased salinity have been determined to be less than significant based on model analyses, and although it is likely that monitoring would occur based on the Settlement Agreement and the Ocean Plan requirements, implementation of **Mitigation Measure 4.3-4 (Operational Discharge Monitoring, Analysis, Reporting, and Compliance)** would ensure compliance with the Ocean Plan monitoring requirements and consistency with MBNMS guidelines for operation of desalination facilities that are protective of the beneficial uses (including aquatic wildlife and habitat) of Monterey Bay. Further, Mitigation Measure 4.3-4 would ensure that monitoring data considers impacts on marine resources and that all collected data is assessed against defined performance standards and that corrective actions are implemented in the case that performance standards are not met. For these reasons, the following mitigation measure is proposed.

Mitigation Measure 4.3-4 requires CalAm to implement a comprehensive Monitoring and Reporting Plan (Plan), following review and approval by the RWQCB and MBNMS that is consistent with the requirements and monitoring guidelines of the Ocean Plan and the MBNMS Guidelines for desalination plants. The monitoring program set forth in the Plan would ensure that adequate water quality and marine resource data are gathered to determine baseline conditions and compliance with Ocean Plan water quality limitations related to salinity. The Plan shall include, at a minimum, the water quality performance standard that operational discharges must comply with the 2 ppt salinity limitation at the BMZ compliance point. The Plan shall also include the performance standard that no statistically significant changes in benthic community composition occur within the maximum extent of the ZID, as compared to reference and baseline conditions that are directly and statistically associated with changes in salinity resulting from operational discharges (with consideration given to natural and seasonal variations and long-regional trends). The Plan shall also include corrective actions that would be required to be implemented if the acquired data indicated deleterious effects to receiving water quality or marine biological resources in the context of the performance standards resulting from operational discharges.

Mitigation Measures

Mitigation Measure 4.3-4 applies only to the operational discharges associated with the MPWSP Desalination Plant through the existing MRWPCA outfall.

Mitigation Measure 4.3-4: Operational Discharge Monitoring, Analysis, Reporting, and Compliance.

To ensure that the operational discharges from the MPWSP are in compliance with the 2 ppt receiving water salinity limitation at the BMZ compliance point required by the California Ocean Plan, the discharger(s) shall implement a Monitoring and Reporting Plan (Plan). The Plan shall, at a minimum, include protocols for monitoring of effluent and receiving water salinity characteristics as well as protocols for determining statistically significant changes in benthic community composition within the maximum extent of the ZID as compared to baseline conditions (established a minimum of one year prior to operations) that is directly associated with changes in salinity resulting from operational discharges (with consideration given to natural and seasonal variations and long-regional trends). Such protocols shall include, but not be limited to, monitoring for benthic community health, aquatic life toxicity, and hypoxia, within the ZID. The Plan shall be consistent with the standard monitoring procedures detailed in Appendix III of the Ocean Plan. Such monitoring protocols specify monitoring plan framework, scope, and methodological design for determining compliance with the Ocean Plan defined receiving water limitations relating to salinity. Prior to implementation, the Plan shall be approved by the RWQCB and MBNMS. Following implementation, the Plan shall be reviewed by the RWQCB, and revised if necessary, as part of the NPDES permit renewal process.

As part of the Plan, receiving water monitoring for salinity shall be conducted at times when the monitoring locations are most likely to be potentially adversely affected by the discharge. The Plan shall establish protocols to establish baseline biological conditions at the discharge location as well as at a reference location outside the influence of the discharge for at least one year prior to commencement of project construction. To determine impacts on marine biological resources against baseline biological conditions, the discharger(s) shall conduct biological surveys (e.g., Before-After Control-Impact studies), that evaluate and quantify the differences between biological communities at a reference site and at the discharge location before and after the discharge(s) commence. All monitoring data, results, and analyses shall be compiled and submitted to the RWQCB and MBNMS for review. Such monitoring shall continue until the RWQCB and MBNMS determines that a regional monitoring program is adequate to ensure compliance with the receiving water limitation.

Water Quality Monitoring. At a minimum, the Plan shall include the following water quality monitoring protocols and monitoring frequencies to assess baseline conditions and to track the compliance of the Project with the performance standard of ensuring operational discharges do not exceed ambient salinity by more than 2 ppt at the edge of the BMZ, as well as to assess the efficacy of any operational or design features implemented:

A. At least one year prior to implementing operational discharges, the discharger(s) shall install continuously recording automated water quality monitoring equipment, such as automatically recording water quality data sondes (water quality monitoring instrument), to monitor salinity and dissolved oxygen levels at one hour intervals in the receiving waters of Monterey Bay. The discharger(s) shall install water quality monitoring equipment at a minimum of four locations within 3 meters of the ocean floor as follows:

    a. 1 monitoring station at the edge of the Zone of Initial Dilution, but not more than 10 meters from the outfall diffuser.

    b. 1 monitoring station at the edge of the Brine Mixing Zone, representing the point of compliance with the Ocean Plan salinity standard (not more than 100 meters from the outfall diffuser).

    c. A representative reference location at least 1000 meters from the outfall diffuser, situated on the same elevation contour as that of the outfall diffuser, in an area outside the influence of operational discharges or other inputs to Monterey Bay, such as operational discharges from other facilities or fresh water inputs in the form of major surface water inputs.

B. Monitoring will be conducted for one year prior to the commencement of operational discharges to confirm baseline conditions.

C. Once operational discharges commence, the discharger(s) shall continue monitoring (for a minimum of five years, as described below) to confirm compliance of operational discharges with the Ocean Plan receiving water salinity limitation, which specifies discharges shall not exceed a daily maximum of 2 parts per thousand (ppt) above natural background salinity, as measured no further than 100 meters (328 ft) horizontally from the discharge point.

The discharger(s) shall retrieve all data from deployed water quality monitoring instrumentation at least four times a year at quarterly annual intervals during both the one year period of baseline monitoring and during the salinity standard compliance monitoring associated with operations. Following data collection, data shall be analyzed for compliance with the receiving water salinity standard defined in the Ocean Plan. Additionally, the salinity and dissolved oxygen data retrieved shall be used, in conjunction with biological survey data, to assess changes to benthic community composition within the ZID. The analyses and monitoring data shall be summarized and submitted to the RWQCB and MBNMS as annual reports as well as made publicly available via the project website. Reports shall include summary graphs of all quality assured/quality controlled data as well as statistical analyses of the data relative to historic baselines. Reports shall assess water quality data within the context of relevant water quality standards. The reports shall describe any measured adverse water quality related changes, such as high salinity or low dissolved oxygen levels that potentially impact marine habitat quality or benthic communities. The reports shall include assessment of the extent to which any measured changes were attributable to controllable factors, such as the variation of combined flows as part of operational discharges.

The analysis and reporting conducted as part of the Plan shall determine the need for corrective actions to be implemented in the form of the design features and operational measures prescribed in **Mitigation Measure 4.3-5** to reduce identified impacts to less-than-significant levels. As part of such a determination for implementation of corrective actions, a schedule for implementation shall be provided, as well as rationale for how such design features and/or operational measures were selected and the expected results following implementation. All analysis and reporting, including determinations for the need for corrective actions to be implemented, the schedule for implementation, and the rationale for selected corrective actions shall be approved by the RWQCB and MBNMS. If at the end of five complete years of monitoring operational discharges, the 24-hour average salinity measured at the edge of the BMZ is less than 75% of the salinity performance standard for 45 days without interruption under all discharge scenarios representative of typical operations (i.e. irrigation season and non-irrigation season operations), and with approval by the RWQCB and MBNMS, the discharger(s) may terminate the monitoring and reporting specified as part of this mitigation measure (but not terminate monitoring and reporting required as part of compliance with NPDES permit conditions or Ocean Plan monitoring and reporting requirements for discharges into California ocean waters).

Impact 4.3-5: Violate water quality standards or waste discharge requirements, or degrade water quality as a result of brine discharge from the operation of the MPWSP Desalination Plant. (*Less than Significant with Mitigation*)

Operational discharges may contain a variety of water quality constituents that, in high enough concentrations, could degrade water quality and adversely affect the beneficial uses of the receiving waters in Monterey Bay and MBNMS resources. The concentrations of water quality constituents present in the operational discharges are determined and impacts on water quality are assessed based on compliance with the Ocean Plan water quality objectives. Depending upon the time of the year and the quantity of wastewater flows released, the operation of the MPWSP Desalination Plant would result in a brine-only discharge or a combined discharge (brine blended with varying flows of treated wastewater). Operational discharges from the MPWSP could violate water quality standards or waste discharge requirements or otherwise degrade the water quality of receiving waters in Monterey Bay.

Treated wastewater from the existing MRWPCA Regional Wastewater Treatment Plant is currently discharged through the MRWPCA outfall and is subject to the provisions and effluent limitations of an NPDES permit (Order No. R3-2014-0013, NPDES Permit No. CA0048551). Under the proposed MPWSP, the current NPDES permit would need to be amended to incorporate the brine-only and combined discharges before the MPWSP Desalination Plant commences operation. Under the amended NPDES permit, the discharges would be subject to the Ocean Plan water quality objectives, which would be incorporated into the permit as specific effluent limitations.

Compliance with water quality objectives other than salinity (see Impact 4.3-4 for assessment of salinity-related impacts) is assessed here. Noncompliance with the Ocean Plan water quality objectives could degrade water quality and adversely affect the beneficial uses of the receiving waters in Monterey Bay. When treated wastewater is discharged, it enters ocean waters into an area known as the zone of initial dilution (ZID). As prescribed in the Ocean Plan, the discharge must meet the water quality objectives at the outer boundary of the ZID, after the wastewater has undergone a period of initial dilution (i.e., mixing of the discharge with the receiving water). Discharge limitations for the NPDES permit (i.e., the permitted in-pipe concentration of water quality constituents) are obtained by quantifying the degree of dilution that occurs within the ZID, referred to as the minimum probable initial dilution (Dm). The water quality objectives established in the Ocean Plan are adjusted by the project-specific Dm to derive the NPDES permit limits on in-pipe constituent concentrations for a wastewater discharge prior to ocean dilution. Determination of a significant impact related to water quality, water quality standards, and waste discharge requirements is based on compliance with the Ocean Plan water quality objectives (see Section 4.3.3).

Introduction to the Impact Analysis of Other Ocean Plan Constituents

Impact 4.3-5 is structured as follows:

- **Operational Discharge Scenarios**: To provide context for the water quality analysis, this section describes the operational discharge scenarios that could occur as a result of implementing the MPWSP.
- **Approach to Analysis**: This section describes the methodologies used in the impact analysis to determine compliance with Ocean Plan water quality objectives.
- **Results and Impact Discussion:** In this section, concentrations of constituents regulated under the Ocean Plan are discussed for each evaluated discharge scenario. First, the concentrations at the edge of the ZID are presented in the context of the minimum dilution values assessed for each discharge scenario. The resulting concentrations are then compared to the Ocean Plan objectives to assess operational water quality impacts and regulatory compliance.

- **Consistency with Regulatory Requirements**: This section assesses the proposed project's consistency with applicable regulatory requirements adopted for the purpose of avoiding or mitigating environmental effects; these requirements are described above in Section 4.3.2, Regulatory Framework. Where the proposed project conflicts with applicable plans or policies, a significant impact would result.
- **Impact Summary and Conclusion**: This section summarizes the results of the comprehensive analysis of water quality impacts in the context of the evaluated operational discharge scenarios. An impact conclusion is provided that considers the results of the analysis in the context of proposed operations, the relevant described significance criteria, and applicable regulations.

Operational Discharge Scenarios

Table 4.3-10 summarizes the operational discharge scenarios evaluated for the MPWSP (described in detail under Impact 4.3-4). Predictive models were used to determine the potential water quality impacts under each discharge scenario.

Approach to Analysis

Potential water quality impacts were identified by determining whether operational discharges would exceed the water quality objectives established in the Ocean Plan. As discussed in detail in Section 4.3.2, Regulatory Framework, the Ocean Plan establishes objectives for a wide range of constituents and also forms the basis of NPDES permit effluent quality requirements for waste discharges to ocean waters. **Table 4.3-4** provides the suite of constituents and their Ocean Plan water quality objectives.

Initial Dilution of Discharges and the "Zone of Initial Dilution"

For typical wastewater discharges, when released from an outfall, the wastewater and ocean water undergo rapid mixing. The mixing of the discharge with receiving ocean waters is affected by the buoyancy and momentum of the discharge plume, a process referred to as initial dilution. Compliance with the Ocean Plan water quality objectives summarized in **Table 4.3-4** is required after the initial dilution of the discharge into the ocean is completed. The initial dilution occurs in an area known as the zone of initial dilution (ZID). The ZID is defined as the zone where buoyancy- and momentum-driven mixing produces rapid dilution of the discharge. Compliance was determined by comparing water quality parameters measured at the edge of the ZID with Ocean Plan objectives, an approach to identifying impacts that is consistent with the requirements outlined in the Ocean Plan.

Data Sources

The impact analysis relies on a compilation of the most recent and best available water quality data from several sources. The MRWPCA wastewater constituent concentrations were determined using historical NPDES compliance data collected by the MRWPCA, results from secondary effluent water quality monitoring conducted between July 2013 and June 2014, and water quality data collected by CCLEAN. The constituent concentrations in the brine were determined using available data from CalAm's temporary test subsurface slant well[36] on the CEMEX property in Marina, California, as well as consideration of the 42 percent efficacy of the treatment process at the MPWSP Desalination Plant. A summary of the estimated water quality for the MPWSP brine and the MRWPCA wastewater is presented in **Appendix D3** (Table 4).

Ocean Plan Discharge Compliance

Trussell Tech conducted the evaluation to determine compliance of the operational discharges with Ocean Plan objectives. This section provides a summary of the data sources and specific methodologies for each step of the model analysis (see **Appendix D3** for details). **Figure 4.3-11** illustrates the approach to analysis.

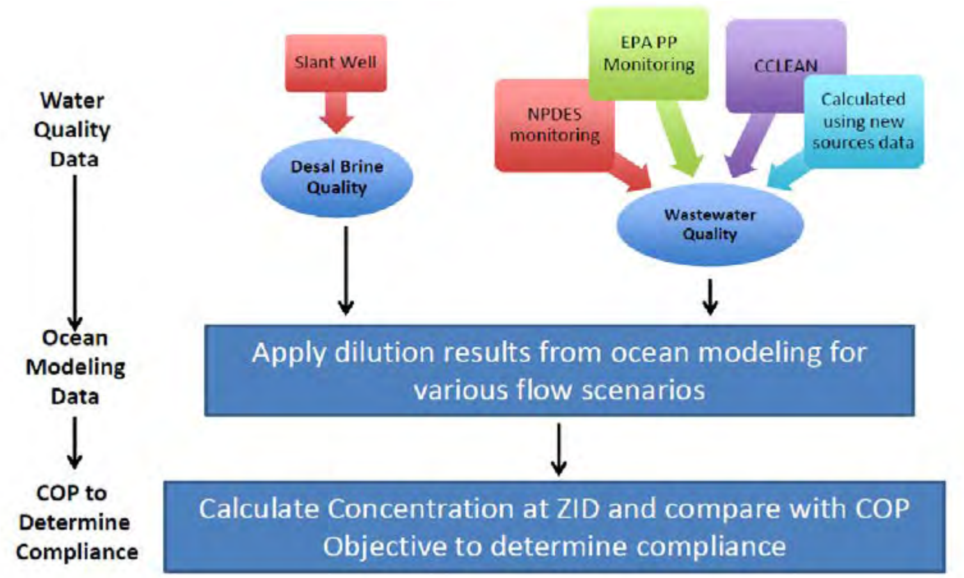


Figure 4.3-11
Summary of Approach to Analysis
for Determining Ocean Plan Compliance

After compiling water quality data for the desalination brine and MRWPCA wastewater (described above), Trussell Tech (2017; **Appendix D3**) combined the data for the evaluated discharge scenarios. Specifically, Trussell Tech calculated the combined in-pipe concentration of water quality constituents prior to discharge. This in-pipe concentration of constituents was calculated using a flow-weighted average of each discharge component for each of the flow scenarios described in **Table 4.3-10**.

The minimum dilution ratios (Dm) developed by Roberts (2017; **Appendix D1**) and summarized in **Tables 4.3-13** and **4.3-14** were then applied to the average flow-weighted in-pipe concentrations to determine the constituent concentrations at the edge of the ZID. The Dm value

36 Long-term pumping and water quality sampling from this well on the CEMEX property in Marina, California began in April 2015.

calculated for each discharge scenario was applied to the in-pipe concentration of the constituents to calculate each constituent's concentration at the edge of the ZID (described in detail in **Appendix D3**). This calculation also considered the existing background concentration of the constituents present in the ocean receiving water. This approach is consistent with the Implementation Provisions set forth in the Ocean Plan (SWRCB, 2016).

Finally, to determine Ocean Plan compliance, the calculated concentrations at the edge of the ZID were compared to the Ocean Plan water quality objective for that constituent (summarized in **Table 4.3-4**). **Appendix D3** documents the data sources and provides further detail on the methodology used to perform the ocean water quality modeling analysis.

Ocean Plan Water Quality Objectives

The Ocean Plan contains three categories of objectives: (1) Objectives for Protection of Marine Aquatic Life, (2) Objectives for Protection of Human Health – Non-Carcinogens, and (3) Objectives for Protection of Human Health – Carcinogens. There are three numeric thresholds (water quality objectives) defined for each constituent in the first category: six-month median concentration, daily maximum concentration, and instantaneous maximum concentration. For the other two categories, there is one numeric threshold: 30-day average concentration. When a constituent had three numeric thresholds, the lowest—the six-month median—was used to estimate compliance. This approach was used to account for the fact that most of the operational discharge scenarios would be sustained on a seasonal basis for up to 6 months (i.e., during the irrigation and non-irrigation seasons), and therefore the 6-month median objective would need to be met. However, the scenarios in which brine is discharged with low flows of wastewater (see **Table 4.3-10**) are unlikely to be implemented in a sustained manner seasonally, but rather represent the time periods when seasonal operations change and wastewater flows are ramped up or down depending on inputs of wastewater to the Salinas Valley Reclamation Project (SVRP) via the Castroville Seawater Intrusion Project (CSIP). Therefore, these transitional scenarios provide a conservative, worst-case assessment of potential water quality impacts.

Basis for Impact Conclusion: The Zone of Initial Dilution

A conservative threshold of 80 percent or greater (≥80%) of the Ocean Plan objective was established for determining potential impacts for constituent concentrations at the edge of the ZID. For each discharge scenario, if the concentration of a constituent at the edge of the ZID was below the 80 percent Ocean Plan water quality objective threshold, then it was assumed that the discharge would comply with the Ocean Plan. However, if the concentration of a constituent at the edge of the ZID exceeded the Ocean Plan objective, then it was concluded that the discharge scenario could violate the Ocean Plan objective and result in a significant impact. If the concentration of a constituent at the edge of the ZID exceeded the conservative threshold of 80 percent or greater of the Ocean Plan objective, it was concluded that the discharge scenario could result in a significant impact unless additional analysis could provide context, such as data outliers or water quality data not representative of proposed operations, to conclude otherwise. Note that this approach could not be applied for some water quality objectives defined in the

Ocean Plan, such as acute toxicity, chronic toxicity, and radioactivity.[37] Also, reliable water quality data were not available for several Ocean Plan constituents, in which case a concentration at the edge of the ZID could not be calculated. This lack of information regarding certain constituents is conservatively addressed in the analysis and impact conclusion presented below.

Results and Impact Discussion

The first step in the Ocean Plan compliance analysis was to estimate the worst-case concentrations of water quality constituents present in the source water for the desalination brine and in the MRWPCA secondary effluent wastewater. The estimated water quality constituent concentrations for each discharge component are presented in **Appendix D3** (Table 4). The flow-weighted in-pipe concentration for each constituent was calculated for each modeled discharge scenario using the water quality results presented in **Appendix D3** (Table 4) and the discharge flows presented in **Table 4.3-10**. The in-pipe concentration was then used to calculate the concentration at the edge of the ZID using the Dm values presented in **Table 4.3-13** (for negatively buoyant discharge plumes) and **Table 4.3-14** (for positively buoyant discharge plumes) for each discharge scenario.

The estimated concentrations for the full suite of Ocean Plan constituents are presented as concentrations at the edge of the ZID and as a percentage of the Ocean Plan numeric water quality objective in **Table A1** and **Table A2** in **Appendix D3** for the fourteen[38] operational discharge scenarios assessed for the MPWSP. As summarized in **Tables A1** and **A2** (**Appendix D3**), out of 80 constituents assessed for compliance with Ocean Plan numeric water quality objectives, the proposed project would comply with 65 objectives under all assessed operational discharge scenarios that could potentially occur. These 65 objectives are not discussed further. The remaining 15 constituents are characterized further regarding potential exceedances of the Ocean Plan objectives.

Two constituents, cyanide and ammonia, were identified as having the potential to exceed the Ocean Plan objectives under certain operational scenarios. Potential issues for cyanide and ammonia compliance were identified to occur when there would only be low volumes of secondary effluent flow mixed with desalination brine. These two constituents may exceed the Ocean Plan objective, or come close to exceeding the objective, and are shown at their estimated concentration at the edge of the ZID and as a percentage of the Ocean Plan numeric water quality objective at the edge of the ZID, in **Tables 4.3-15** and **4.3-16**, respectively. Ten constituents[39]

[37] Calculating flow-weighted averages for toxicity (acute and chronic) and radioactivity (gross beta and gross alpha) is not appropriate based on the nature of the constituents. These constituents were measured individually for the secondary effluent, and these individual concentrations would comply with the Ocean Plan objectives. Current discharges of the secondary effluent and hauled waste are monitored semiannually for acute toxicity, chronic toxicity, and radioactivity per the existing NPDES permit and would continue to be monitored as part of future NPDES permit requirements. (See Appendix D3, Section 4.4 for details).

[38] The Draft EIR/EIS considered five operational discharge scenarios. This model analysis determined that MPWSP operational discharges would not exceed Ocean Plan water quality objectives for the constituents listed in Table 4.3-4 for which a compliance determination could be made. (See Draft EIR/EIS at page 4.3-100).

[39] Chlorinated phenolics, 2,4-dinitrophenol, tributyltin, aldrin, benzidine, bis(2-chloroethyl)ether, 3,3-dichlorobenzidine, 1,2-diphenylhydrazine, heptachlor, 2,4,6-trichlorophenol.

TABLE 4.3-15
MPWSP OPERATIONAL DISCHARGE SCENARIOS: ESTIMATED CONCENTRATIONS AT THE EDGE OF THE ZID FOR OCEAN PLAN CONSTITUENTS OF CONCERN

Constituent	Units	Ocean Plan Objective	Estimated Concentration at Edge of ZID by Flow Scenario Number[a,b]													
			MPWSP Typical Operations							MPWSP Post Shut-Down Operations							
			2	4	6	8	11	12	14	15	17	22	23	25	26	28
Objectives for protection of marine aquatic life - 6-month median limit																
Cyanide	µg/L	1	0.6	1.1	1.3	1.4	1.3	1.0	0.5	0.6	1.0	1.3	1.3	1.2	0.9	0.4
Ammonia (as N) - 6-mo median	µg/L	600	29	341	523	600	614	461	255	26	301	575	585	546	409	243

NOTES:
[a] Flow scenarios correspond to those scenario numbers provided in Table 4.3-10
[b] Shading indicates constituent is expected to be greater than 80 percent (orange shading) or exceed (red shading) the ocean plan objective for that discharge scenario.

SOURCE: Appendix D3.

TABLE 4.3-16
MPWSP OPERATIONAL DISCHARGE SCENARIOS: ESTIMATED CONCENTRATIONS AT THE EDGE OF THE ZID EXPRESSED AS PERCENTAGE OF OCEAN PLAN OBJECTIVE FOR OCEAN PLAN CONSTITUENTS OF CONCERN

Constituent	Units	Ocean Plan Objective[40]	Percentage of Ocean Plan Objective at Edge of ZID by Scenario[a,b]													
			MPWSP Typical Operations							MPWSP Post Shut-Down Operations						
			2	4	6	8	11	12	14	15	17	22	23	25	26	28
Cyanide	µg/L	1	59%	108%	133%	140%	134%	99%	52%	58%	101%	134%	133%	120%	88%	51%
Ammonia (as N) - 6-mo median	µg/L	600	5%	57%	87%	100%	102%	77%	43%	4%	50%	96%	97%	91%	68%	40%

NOTE: footnotes [a] and [b] provided under Table 4.3-15

SOURCE: Trussell Technologies, 2017 (Appendix D3).

40 Objectives for protection of marine aquatic life - 6-month median limit

were not detected in any of the source waters (desalination brine or wastewater) and results for these ten constituents are summarized in **Tables A1** and **A2** (**Appendix D3**). However, for these ten constituents, the analytical Method Reporting Limit[41] (MRL) achieved by the testing laboratory was higher than the Ocean Plan numeric objective.[42] This is a typical occurrence for ocean discharges as, under certain circumstances due to the limitations of available analytic techniques, an MRL can be higher than the Ocean Plan objective for certain constituents. Three additional constituents—acrylonitrile, beryllium, and TCDD equivalents—were initially identified as having the potential to exceed water quality objectives because they were detected in either the desalination brine or wastewater, but not in both. However, there is not enough information to assess the concentrations for these three constituents in the combined discharge of wastewater and brine due to differences in MRLs applied in the brine source waters as compared to the MRWPCA wastewater.

Based on the conservative 80 percent threshold described above for assessing operational discharges for compliance with Ocean Plan objectives, implementation of the MPWSP could potentially cause exceedances of Ocean Plan water quality objectives for the measurable constituents ammonia and cyanide (see **Tables 4.3-15** and **4.3-16**) under certain operational conditions when wastewater volumes co-mingled with the brine are low. For an additional thirteen constituents, there is not enough information to assess concentrations at the edge of the ZID due to differences in MRLs used to assess the source waters or due to MRLs being higher than Ocean Plan objectives. Therefore, it is conservatively concluded that Ocean Plan water quality objectives could potentially be exceeded during operations for some operational discharge scenarios, resulting in a significant impact. **Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives)** would require CalAm to perform an extensive water quality assessment using protocols defined in Appendix II "Minimum Levels" of the 2015 California Ocean Plan prior to implementation of the MPWSP. Operational discharges that cannot be demonstrated to conform to the Ocean Plan water quality objectives, incorporated as performance standards, may only be discharged following implementation of additional design features, engineering solutions, and/or operational measures as defined in Mitigation Measure 4.3-5 that ensure compliance with objectives. Should analytical technologies be unable to achieve MRLs at or below Ocean Plan limits, it will be presumed those constituents exceed Ocean Plan water quality objectives at concentrations consistent with MRLs, and appropriate design features, engineering solutions and/or operational measures designed to mitigate the exceedance of these constituents will be implemented. With implementation of the proposed mitigation, the impact would be less than significant.

Additionally, future water quality testing and analysis, required under the NPDES permit process, would ensure that operational discharges under the MPWSP would fully comply with Ocean Plan water quality objectives and NPDES effluent limitations, including for toxicity and radioactivity.

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[41] The lowest amount of an analyte in a sample that can be quantitatively determined with acceptable precision and accuracy under stated analytical conditions (i.e., the lower limit of quantitation).

[42] The exceptions to this statement are:2,4-dinitrophenol was not detected in the MPWSP secondary effluent, and this MRL is lower than the Ocean Plan objective (i.e., MRL = 0.5 µg/L versus 4 µg/L = objective); heptachlor was not detected above the MRL in the slant well, and this MRL is lower than the Ocean Plan objective (i.e., MRL = 0.00000069 µg/L versus 0.00005 µg/L).

Consistency with Regulatory Requirements

In addition to the impacts described above, operational discharges of the MPWSP could conflict with other applicable regulatory requirements and guidelines, as noted in Section 4.3.2, Regulatory Framework. Operational discharges resulting from implementation of the proposed MPWSP may be potentially inconsistent with provisions of the National Marine Sanctuaries Act, the California Ocean Plan, MBNMS Guidelines for operation of desalination facilities, and the City of Marina LCP (Section 30231: Biological Productivity; Water Quality). Specifically, operational discharges could conflict with requirements and guidelines which were established to avoid or mitigate impacts on water quality, aquatic wildlife, and other beneficial uses of marine waters. **Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives)** would require CalAm to perform an extensive water quality assessment using protocols defined in Appendix II “Minimum Levels” of the 2015 California Ocean Plan prior to implementation of the MPWSP; in addition, operational discharges that cannot be demonstrated to conform to the prescribed performance standards may only be discharged following implementation of additional design features, engineering solutions, and/or operational measures as defined in Mitigation Measure 4.3-5. With implementation of the proposed mitigation, the proposed project would be consistent with regulatory requirements and MBNMS guidelines.

Impact Summary and Conclusion – Ocean Plan Water Quality Constituents

The model-based analyses concluded constituent concentrations would become elevated for the assessed discharge scenarios to levels greater than 80 percent of the Ocean Plan objective for ammonia and cyanide. Therefore, it was concluded that the MPWSP would result in exceedances of Ocean Plan objectives, resulting in a significant impact related to water quality standards, waste discharge requirements and water quality of receiving waters in Monterey Bay. Water quality testing and analysis required under the NPDES permit process would determine whether operational discharges under the MPWSP would fully comply with Ocean Plan water quality objectives. Significant impacts would be reduced to a less-than-significant level by implementing **Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives)**, which requires corrective actions be incorporated into the Project to ensure operational discharges meet all Ocean Plan water quality objectives.

Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives) (presented below) requires that, prior to implementing operational discharges via the existing outfall, CalAm must perform an extensive water quality assessment as part of a waste disposal study to demonstrate compliance with Ocean Plan water quality objectives and minimum initial dilution requirements. Specifically, CalAm (and other dischargers, if applicable) would be required to analyze MPWSP operational discharges for the full range of regulated water quality constituents specified in the Ocean Plan and NPDES water quality requirements, in accordance with protocols approved by the RWQCB. Discharges would not be allowed if they do not conform to the Ocean Plan objectives for water quality. If the water quality assessment shows that releases via the existing outfall would exceed Ocean Plan objectives, then additional design features, engineering solutions, and/or operational measures must be implemented to reduce the concentration of water quality constituents in the operational discharges such that they conform with these objectives.

Mitigation Measure 4.3-4 (Operational Discharge Monitoring, Analysis, Reporting, and Compliance), described under Impact 4.3-4, above, would further reduce and minimize potential impacts by requiring CalAm to implement a comprehensive Monitoring and Mitigation Plan (Plan), following approval by the RWQCB and MBNMS, to obtain field monitoring and marine resource data in the area affected by a project. The Plan would set forth appropriate response thresholds and corrective actions that would be required if the acquired data indicated deleterious effects on receiving water quality or marine biological resources from MPWSP operational discharges.

Additionally, as stated above, it is required by law that operational discharges from the MPWSP be incorporated into an amended NPDES Permit. Under the amended NPDES permit, MPWSP operational discharges would be subject to the permit requirements prescribed by the RWQCB as part of the permit amendment process. Such requirements would be designed to ensure that operation of the MPWSP Desalination Plant would not violate waste discharge requirements defined in the amended NPDES permit, which incorporate the Ocean Plan objectives, upon discharge of the brine.

Mitigation Measures

Mitigation Measure 4.3-5 applies only to the operational discharges associated with the MPWSP Desalination Plant through the existing MRWPCA outfall.

Mitigation Measure 4.3-5: Implement Protocols to Avoid Exceeding Water Quality Objectives.

Compliance with Water Quality Objectives. Prior to MPWSP operations, and as part of the MRWPCA NPDES Permit amendment process (Order No. R3-2014-0013, NPDES Permit No. CA0048551), the permitee shall complete a water quality assessment. As part of the water quality assessment, the permitee shall:

- Quantify the projected final design discharge volume(s) by month based on project design and historic and projected monthly wastewater discharge volumes.
- Collect samples of the source waters and operational discharges and analyze them in a certified laboratory for the constituents listed in Table 1 of the California Ocean Plan (Ocean Plan Water Quality Objectives). Sampling must be completed in accordance with protocols approved by the US EPA and RWQCB.
- Demonstrate compliance for the full range of regulated water quality constituents specified in the Ocean Plan and NPDES water quality requirements in the context of minimum initial dilution values at the edge of the Zone of Initial Dilution (ZID) for the point of discharge.

If the results of the water quality assessment and waste disposal study find that operational discharges will not meet the NPDES water quality requirements, including the Ocean Plan receiving water limitation for salinity, at the edge of the zone of initial dilution (ZID) and the Brine Mixing Zone (BMZ), respectively (incorporated here as performance standards), then the MPWSP operational discharges shall not be released as proposed. Such operational discharges shall be subject to additional design features, engineering solutions, and/or operational measures to reduce the concentration of water quality constituents to be in conformance with the Ocean Plan water quality objectives and amended NPDES permit requirements at the edge of the ZID or BMZ, as applicable. Such necessary design features and operational measures shall either be implemented individually or in combination to achieve compliance (unless the RWQCB determines that different but equally effective measures be employed).

Such possible additional design features and operational measures include:

(1) *Retrofitting the existing outfall to increase dilution:* If this operational measure is implemented, the dischargers shall retrofit the outfall diffuser to include inclined diffuser jets positioned at the optimum angle to achieve maximum dilution.

(2) *Additional pre-treatment of source water to the Desalination Plant:* Feasible methods to remove polychlorinated biphenyls (PCBs) and other organic compounds from the source water include additional filtration or use of granular activated carbon (GAC) - a U.S. Environmental Protection Agency-approved method.

(3) *Treatment of discharge:* The dischargers must consider one or more of the alternative feasible methods that remove residual compounds from the discharge to meet water quality objectives at the edge of the ZID. These methods include the following:

    (a) Use of GAC (similar to that under the additional pre-treatment of source water described above, but here such treatment would be applied to the effluent following processing at the desalination facility instead of to the source water from the slant wells); or

    (b) Advanced oxidation with ultraviolet light with concurrent addition of hydrogen peroxide.

(4) *Flow Augmentation:* If this operational measure is implemented, the dischargers shall decrease the density difference of the discharge and the receiving water through the addition of up to 5 mgd of flows with densities close to freshwater to increase the minimum dilution of dense discharges.

(5) *End gate modification:* If this operational measure is implemented, the dischargers shall retrofit the outfall diffuser end gate to replace the existing opening with a minimum of one 6-inch Tideflex (or similar) check valve (Hydraulic Code 355) installed at an inclined (upward) angle greater than 20°, with an optimum angle of 60° to maximize dilution.

Determination of Efficacy of Mitigation Measures

The design features, engineering solutions, and/or operational measures required to be implemented, as necessary, either individually or as a combination, through Mitigation Measure 4.3-5 and/or Mitigation Measure 4.3-4, include a number of strategies, described below. The most effective strategy for ensuring compliance with Ocean Plan objectives, and the one most likely to be implemented, is retrofit of the existing diffuser with inclined jets. Such an option would substantially increase dilution at the edge of the ZID, ensuring compliance with all Ocean Plan water quality objectives, and would also result in the least secondary impacts (assessed under "Secondary Impacts of Mitigation Measures", below). Additional strategies that may be employed to address water quality impacts associated with operational discharges include pre-treatment of source water, post processing treatment of discharge flows, and/or flow augmentation. While less likely to be implemented, these strategies are included here as feasible measures that may be employed to achieve the performance standards required under Mitigation Measure 4.3-5. Information is provided below regarding the feasibility for these measures to reduce constituent concentrations and/or increase minimum dilution at the edge of the ZID from operational discharges in a manner that would ensure compliance with Ocean Plan objectives:

- **Retrofitting the existing outfall to increase dilution**: Diffusers for discharging dense effluents typically consist of nozzles that are inclined upwards to increase dilution and mixing. Such methods for dilution have been extensively studied (Roberts, 2016). These studies have demonstrated that retrofitting the existing outfall to include inclined diffuser jets (jets are currently oriented horizontally) increases dilution substantially. The optimum angle to the horizontal for the discharge of dense plumes for increasing initial dilution is 60° as this maximizes the path length and dilution of the dense discharge at the point of contact on the seafloor. Inclined jets can be achieved by retrofitting the existing check valves with upwardly inclined nozzles. From model analysis, all diffuser ports would require retrofit to achieve substantially increased dilution (i.e., not a subset).

  Roberts (2017; Appendix D1) assessed a representative number of discharge scenarios to compare the minimum dilution achieved if the diffuser ports were retrofitted to be inclined at 60°. **Table 4.3-17** summarizes the results for the assessed discharge scenarios, providing dilution results for both horizontal and inclined jets for comparison. Additionally, to demonstrate the feasibility for inclined jets to successfully mitigate potential water quality impacts, Table 4.3-17 includes the minimum dilution required for the assessed discharge scenarios to achieve compliance with Ocean Plan WQOs for all water quality constituents (for additional details related to Ocean Plan compliance modeling, see Appendix D3).

TABLE 4.3-17
EFFECT OF NOZZLE ANGLE ON DILUTION FOR SELECT OPERATIONAL DISCHARGE SCENARIOS

Scenario No.	Discharge Scenario	Constituent Flows[a](mgd)		Minimum Modeled Dm		Minimum Required Dm
		Secondary Effluent	Desal Brine	Horizontal Diffusers	Inclined Diffusers (60˚)	
Typical Discharge Scenarios						
1	SE Only	19.78	0	187	180	80
2	Brine only	0	13.98	14.4	49.7	8
5	Brine + Low (3) SE	3	13.98	16.7	67.9	21
10	Brine + Mod (8) SE	8	13.98	26.5	142.7	34
13	Brine + High (15) SE	15	13.98	92	73	45
High Brine Discharge Scenarios (post-shutdown operations)						
20	High Brine + Mod (5) SE	5	16.31	18.6	84.7	25
26	High Brine + High (12) SE	12	16.31	43.9	344.6	38

SOURCE: Roberts, 2017 (Appendix D1); Trussell Tech, 2017b (Appendix D3).

- **Use of granular activated carbon (GAC):** GAC is a U.S. Environmental Protection Agency approved method. Applied as part of pretreatment of source water of post processing treatment of effluent, GAC acts as a very strong sorbent and can effectively remove PCBs and other organic compounds from the source water (Luthy, 2015). See Section 4.3.5.4 for additional information on GAC.

- **Advanced oxidation:** Advanced oxidation with ultraviolet light with concurrent addition of hydrogen peroxide is successfully used for the destruction of a variety of environmental contaminants such as synthetic organic compounds, volatile organic compounds, pesticides, pharmaceuticals and personal care products, and disinfection byproducts. This process is energy intensive, but oxidizes compounds that are difficult to adsorb with activated carbon, and requires a relatively small footprint.

- **Flow Augmentation to increase dilution**: The minimum dilution of dense discharges may be increased through the addition of flows with densities close to freshwater (such as the MRWPCA waste water), when available. The addition of such flows would decrease the density difference of the operational discharge and the receiving water. As modeled by Roberts (2016; Appendix D1), it was demonstrated that when flows with densities similar to that of freshwater were added to the dense brine discharges, the resulting discharge plumes exiting the diffuser ports had a flatter and longer trajectory due to smaller density differences of the discharge as compared to the receiving waters. The decrease in density differences resulted in increased dilution. For low added volumes (e.g. 1 mgd), the effect on dilution was determined to be minor. As the added flows are increased to where the density of the combined effluent approaches that of the background, i.e., the flow becomes neutrally buoyant, the dilution increases exponentially. Roberts (2016) demonstrated that adding 2.3 to 4.8 mgd of freshwater flows, depending on the discharge scenario, can substantially increase minimum dilution at the edge of the ZID to a degree similar to that achieved by retrofitting the diffuser ports with nozzles that are inclined upwards 60° (described above).

- **Retrofitting the end gate to increase dilution**: The minimum dilution of discharges exiting the outfall diffuser end gate would be substantially increased by modifying the existing 2-inch opening with a Tideflex check valve installed at an upward angle to maximize dilution of dense discharges, as described above for retrofitting the existing outfall to increase dilution. As modeled by Roberts (2017; Appendix D1, Supplemental Report), it was demonstrated that modifying the end gate with an inclined check valve would slightly reduce flow volume and increase exit velocity, resulting in an increased minimum dilution at the end gate, as compared to existing conditions. As described in detail in Section 3.1 of Roberts (2017), any upward angle greater than about 20° would result in dilutions that meet the BMZ salinity requirements, with an optimum angle to maximize dilution calculated as being 60° (see Figures 2 and 3, Roberts 2017, Appendix D1).

4.3.5.3 Secondary Impacts of Mitigation Measure 4.3-5

Potential secondary impacts associated with implementation of **Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives)** are discussed below. Secondary impacts would be associated with the treatment methods and any components that may be installed as part of **Mitigation Measure 4.3-5**.

Retrofitting the Existing Outfall to Include Inclined Diffuser Jets and/or Modified End Gate to Increase Dilution

Retrofitting the existing MRWPCA outfall diffuser would be achieved by installing inclined nozzles on the existing diffuser check valves and/or replacing the existing end gate opening with a minimum of one 6-inch Tideflex (or similar) check valve. The impacts associated with the physical construction of such a retrofit would likely be minor and temporary, consisting primarily of minor construction-related sea-bed disturbance and water quality degradation in the form of increased turbidity and disturbance of benthic organisms on and adjacent to the outfall diffuser. Such temporary disturbances to the seafloor and increases in associated turbidity would be minor, primarily occurring over several hours to a day or two, through the process of divers staging and installing equipment to complete the retrofit of the diffuser. Additionally, the use of support craft at the water surface could be used for staging equipment and construction supplies or to facilitate the removal of built up sediment from the terminus of the diffuser pipe. Water quality would rapidly return to ambient conditions following completion of the retrofit as sediments re-settle on the seabed. Similarly, any disturbance to benthic communities would consist of a minor disturbance over a small area, consisting of the outfall diffuser and seabed immediately surrounding the diffuser. Prior to implementation of the retrofit, MBNMS would review and approve design specifications and construction plans to ensure that disturbances to benthic communities are minimized or avoided. The disturbance would be short in duration and of low intensity and benthic communities would likely recover to baseline conditions. Secondary impacts from construction related to retrofitting the existing outfall to increase dilution would be less than significant.

Operation of the outfall diffuser following modification of the end gate described above was assessed by Roberts (2017; Appendix D1) to determine whether such a modification would reduce overall dilution from the outfall diffuser ports, as described under Impact 4.3-4 and in detail in Appendix D1. As demonstrated by the model analyses presented in Appendix D1, modification of the end gate would have minimal effect on the flow distribution between the diffuser ports and minimal effect on head loss. Typical flow variations with and without the end gate valve are assessed in Roberts (2017) and shown in Figure 3 of Appendix D1 (Supplemental Report). For example, discharge scenarios involving only secondary effluent (total flow of 19.88 mgd, density 999.0 kg/m3) and only brine (flow of 14.08 mgd, density 1,045.1 kg/m3) are assessed. Flow distributions with and without the Tideflex valve are virtually indistinguishable. The flow exiting from the end gate is reduced slightly from 4 percent to 3 percent of the total for the secondary effluent only scenario and from 5 percent to 4 percent for the brine only scenario. The velocity from the end gate is increased by the check valve, from 6.7 to 10.7 ft/s for the secondary effluent only scenario and from 6.1 to 9.7 ft/s for the brine only scenario. The additional total head loss through the outfall diffuser overall due to the check valve is negligible, about 0.01 ft. Therefore, modification of the end gate would have only a negligible effect on overall dilution from the outfall diffuser ports for all assessed discharge scenarios. Secondary operational impacts related to modifying the end gate to increase dilution would be less than significant.

Operation of the outfall diffuser following installation of inclined nozzles on the existing diffuser check valves was assessed by Roberts (2017) and Trussell Tech (2017) to determine whether retrofitting the diffuser would reduce overall dilution from the outfall diffuser ports for certain operational discharge scenarios (see Appendix D1 and Appendix D3 for details). Roberts (2017) determined that orienting the nozzles upwards from horizontal would increase the dilution of brine mixtures that are denser than the receiving water (Table 4.3-17). However, for buoyant effluents, such as when brine is absent or when high volumes of MRWPCA secondary effluent are discharged with brine, dilution will become decreased. Decreasing dilution at the outfall for buoyant effluents could prevent MRWPCA from meeting NPDES discharge requirements, especially should the desalination facility be offline. To determine whether retrofitting the outfall diffuser with inclined jets could cause secondary impacts on water quality through reducing minimum dilution for buoyant discharges, the effect on dilution of varying nozzle orientations for dense and buoyant effluents was modeled (Appendix D1). As summarized in Table 4.3-17, and discussed in detail by Roberts (2017; Appendix D1), retrofitting the diffuser with inclined jets would not reduce minimum dilution to the extent that buoyant plumes would fail to conform to NPDES or Ocean Plan requirements. Secondary operational impacts related to retrofitting the existing outfall to increase dilution would be less than significant.

GAC Facility to Treat the Source Water and/or Brine:

- The GAC facility would consist of GAC adsorption equipment likely consisting of a series of pressure vessels, a building and a backwash system similar to the proposed pressure filtration pretreatment system. Based on the preliminary MPWSP Desalination Plant design, the GAC units could be accommodated within the currently proposed building footprint. The installation of the GAC facility would be a part of the construction activities associated with the MPWSP Desalination Plant site within the existing footprint and would not create new or additional impacts beyond those discussed for the construction at the site in this EIR/EIS. The impact would be less than significant.

- Treatment of the source water (as opposed to the brine) could potentially be provided by GAC filter-adsorbers that would be similar to the proposed pressure filtration pretreatment system. If GAC adsorption of the source water were to replace or supplement the proposed conventional filtration process, water quality of the drinking water delivered to the distribution system would likely improve as measured by lower concentrations of organic compounds, total organic carbon, disinfection byproducts; fewer tastes and odors; and more stable chlorine residuals. Other benefits might include reduced fouling potential at the RO membranes.

  Operation of the GAC adsorption process would generate spent GAC, which would be considered hazardous waste. Handling and disposal of the waste generated would be subject to federal and state hazardous waste regulations (discussed in Section 4.7, Hazards and Hazardous Materials). For example, the federal Toxic Substances Control Act of 1976 and the Resource Conservation and Recovery Act of 1976 authorized the USEPA to regulate the generation, transportation, treatment, storage, and disposal of hazardous waste. The Resource Conservation and Recovery Act was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the “cradle to grave” system of regulating hazardous wastes. Further, the California Occupational Safety and Health Act (OSHA) of 1973 would apply to handling of spent GAC material onsite. The California OSHA addresses California employee working conditions, enables the enforcement of workplace standards, and provides for advancements in the field of occupational health and safety. Thus, handling, transportation, and disposal of the spent GAC material generated at the MPWSP Desalination Plant site would be subject to, and would adhere to, the regulations intended to protect environmental and public health and ensure safety. Therefore, the impact would be less than significant.

- Operating the GAC adsorption system would result in an increase in energy use, in particular if there is additional pumping necessary. The system could operate using the pressure of the brine stream, or it may require an intermediate pumping station. It is anticipated that operation of the GAC adsorption system would thus increase the energy use at the proposed MPWSP Desalination Plant. The impacts resulting from energy use from the proposed project are discussed in Section 4.11, Greenhouse Gas Emissions and Section 4.18, Energy Conservation, and the secondary impacts from the operation of the GAC adsorption system are discussed below.

  – Section 4.11, Greenhouse Gas Emissions, identifies the increase in greenhouse gas emissions due to increased energy use from the proposed project as a significant yet mitigable impact. Any increase in the energy usage resulting from operating the GAC adsorption system would increase the severity of the impact but would still be mitigable. Therefore, operating the GAC adsorption system would not contribute to a significant and unavoidable impact.

  – CalAm's operational electrical power demand for water production under the proposed project (including water produced from the MPWSP Desalination Plant, Seaside Groundwater Basin production wells, ASR system, and the Carmel River) and the net increase in annual electrical power demand for water production is described in Section 4.18, Energy Conservation. The analysis in Section 4.18 determined that the proposed project would not consume energy wastefully or inefficiently. The GAC adsorption system for removing organic compounds from the source water and/or the brine would be employed to ensure that the brine discharged to the bay would comply with the water quality standards or regulatory requirements, which are protective of the beneficial uses of the bay. Therefore, electricity consumed as a result of project operations, including that from operating the GAC system, would not be wasteful or inefficient. The increase in the energy use for any GAC adsorption system would be less than significant.

    As discussed in Section 4.18, Energy Conservation, Pacific Gas and Electric (PG&E), the power provider in the project area, would have adequate capacity and infrastructure to support the proposed project. Electric power for implementation of the proposed project could be accommodated by the existing local and regional energy supplies and the impact would be less than significant. An incremental increase in the energy use from the operation of the GAC adsorption system would be accommodated within the existing capacity. Therefore, the secondary impact would be less than significant.

- Maintenance of the GAC system would involve removing and replacing the GAC, which would be accommodated within the proposed operations and maintenance of the MPWSP Desalination Plant. The impact from routine transport, use, or disposal of hazardous materials during project operations is discussed under Impact 4.7-6 in Section 4.7, Hazards and Hazardous Materials. As discussed in the section, CalAm, as required by law, would submit a Hazardous Materials Business Plan (HMBP) for the project facilities to the Monterey County Environmental Health Division prior to the start of project operations; therefore, no additional environmental impact would result from maintenance.

Advanced Oxidation System and Facility to Treat the Brine:

- The advanced oxidation system would likely include a building with a liquid hydrogen peroxide chemical storage and feed system. The building would be installed as part of the construction activities associated with the MPWSP Desalination Plant site and would not create new or additional impacts beyond those discussed for the construction at the site.
- The advanced oxidation process would generate minimal byproducts and no residuals compounds or liquid or solid waste. The quality of the brine discharged to Monterey Bay would improve as a result of the removing organic compounds. The impact related to solid or liquid waste and disposal would therefore be less than significant.
- Implementing the advanced oxidation system would result in an increase in energy use. It is anticipated that operation of the advanced oxidation system would thus increase the energy use at the proposed Desalination Plant. The impacts resulting from energy use from the proposed project are discussed in Section 4.11, Greenhouse Gas Emissions, and Section 4.18, Energy Conservation, and the secondary impacts from the operation of the advanced oxidation are discussed below:
  - Section 4.11, Greenhouse Gas Emissions, identifies the increase in greenhouse gas emissions due to increased energy use from the proposed project as less than significant with mitigation. Any additional increase in energy use resulting from operating the advanced oxidation system would increase the severity of the impact but would remain mitigable. Therefore, in this issue area, operating the advanced oxidation system would not contribute to a significant and unavoidable impact.
  - CalAm's operational electrical power demand for water production under the proposed project (including water produced from the MPWSP Desalination Plant, Seaside Groundwater Basin production wells, ASR system, and the Carmel River) is estimated in Section 4.18, Energy Conservation. The analysis in Section 4.18 determined that the proposed project would not consume energy wastefully or inefficiently. The advanced oxidation system for removing organic compounds from the source water and/or the brine would be employed to ensure that the brine discharged to the bay would comply with the water quality standards or regulatory requirements, which are protective of the beneficial uses of the bay. Therefore, electricity consumed as a result of project operations, including that from operating of the advanced oxidation system, would not be wasteful or inefficient. The increase in the energy use for any advanced oxidation system would be less than significant.

    Further, PG&E, the power provider in the project area, would have adequate capacity and infrastructure to support the proposed project. Electric power for implementation of the proposed project could be accommodated by the existing local and regional energy supplies and the impact would be less than significant. An incremental increase in energy use from the operation of the advanced oxidation system would be accommodated within the existing capacity of PG&E. Within the MPWSP Desalination Plant site, this could require increasing the capacity of the power distribution system to accommodate the additional electrical load; however, this would not entail additional construction or installation activities. The secondary impact is considered less than significant.
- The advanced oxidation system would require a liquid hydrogen peroxide chemical storage and feed system onsite. Under the proposed project, the MPWSP Desalination Plant

operations would involve the use and storage of chemicals to remove performance-reducing deposits from the pretreatment filtration system and RO membranes, as well as chemicals to adjust product water quality. The impact from routine transport, use, or disposal of hazardous materials during project operations is discussed under Impact 4.7-6 in Section 4.7, Hazards and Hazardous Materials. As discussed in the section, CalAm, as required by law, would submit a Hazardous Materials Business Plan (HMBP) for the project facilities to the Monterey County Environmental Health Division prior to the start of project operations. The HMBP is required to include information on hazardous material handling and storage, including containment, site layout, and emergency response and notification procedures in the event of a spill or release. In addition, the plan requires annual employee health and safety training. The plan must be approved by the County prior to commencement of project construction and the project facilities would be subject to post-construction compliance inspections. The HMBP would also provide the local agencies with the information they need to plan appropriately for a chemical release, fire, or other incident, which would reduce the potential for an accidental release to cause harmful health effects to workers or the public or substantial degradation to soil or water quality. Compliance with these various regulations would ensure this impact is less than significant. The hydrogen peroxide storage and feed system for the advanced oxidation system would be included as part of the HBMP and be subject to the regulatory requirements described for other chemicals proposed to be stored, used, and handled onsite and would not result in a new or significant impact. The secondary impact therefore would be less than significant.

Flow Augmentation

Flow augmentation would be achieved by the addition of flows to operational discharges with densities close to freshwater (such as the MRWPCA waste water), when available. The impacts associated with such flow augmentation would be minor, consisting of negligible increased velocities of the operational discharges. Extreme discharge velocities have the capacity to entrain aquatic wildlife, such as larval stage or planktonic stage organisms, and subject such organisms to shear stress, resulting in increased rates of mortality. As demonstrated by Roberts (2016), because the existing diffuser ports are equipped with Tideflex duckbill diffuser nozzles, the diffuser ports increase in opening diameter as flow increases. Therefore, velocity increases as a result of flow augmentation would be negligible due to the increased port opening diameter offsetting the increased jet velocity as compared to increased velocities that would occur for a fixed orifice port. Impacts relating to entrainment and shear stress are discussed in detail in Section 4.5, Marine Biological Resources. The secondary impact from flow augmentation to increase dilution would be less than significant.

Impact 4.3-6: Degradation of water quality due to discharges associated with maintenance of the subsurface intake wells and ASR-5 and ASR-6 Wells. *(Less than Significant)*

This impact focuses on discharges of effluent generated during maintenance of the subsurface intake wells and ASR-5 and ASR-6 Wells. This impact does not apply to any of the other proposed facilities.

Subsurface Slant Wells

As described in Section 3.6.1 of Chapter 3, Description of the Proposed Project, the subsurface slant wells would require periodic maintenance every 5 years. Slant well maintenance activities would disturb roughly 6 acres at the CEMEX active mining area for 9 to 18 weeks during well cleaning operations. Beach sand disturbed during maintenance activities would be susceptible to erosion and could migrate outside of the work area. However, because sand migration is a natural ongoing process along the shoreline, the migration of sand within and to areas adjacent to the CEMEX active mining area would not adversely affect water quality. However, toxic chemicals used to maintain heavy maintenance equipment, such as fuels and petroleum lubricants, if not managed appropriately, could be accidentally released to sensitive beach areas and adversely affect shallow groundwater and/or water quality in Monterey Bay.

As described in Chapter 3, Description of the Proposed Project, mechanical brushes would be lowered into the slant wells to mechanically clean the well screens. If chemical cleaning products are needed for maintenance, only environmentally inert products would be used. However, the effluent produced during slant well cleaning could carry sediment or other contaminants that, if discharged directly to the beach area, could adversely affect water quality in Monterey Bay.

Slant well maintenance activities would be considered a “land disturbance activity” and would be subject to the water quality control requirements of the *General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009, NPDES No. CAS000002)* (Construction General Permit) (SWRCB, 2009). Similar to slant well construction activities, the contractor conducting the maintenance would be required to prepare a SWPPP that includes specific measures to manage pollutants generated during maintenance activities. These measures would address the potential adverse effects to water quality associated with equipment fueling and storage, inadvertent releases of toxic chemicals, and discharges of cleaning effluent. The cleaning effluent would be conveyed to portable holding tanks to allow chemical residuals and sediment to settle out, and the decanted water would be subsequently percolated into the ground in the CEMEX active mining area. (See Section 4.3.2.2 and Impact 4.3-1, above, for additional information regarding the Construction General Permit requirements.) Adherence to these requirements would prevent significant water quality impacts during slant well maintenance activities. The impact would be less than significant. No mitigation is necessary.

ASR-5 and ASR-6 Wells

As part of routine maintenance of the ASR-5 and ASR-6 Wells, and similar to the routine maintenance of the four existing ASR wells, CalAm facility operators would regularly backflush accumulated sediment and turbid water from the two wells. The duration of the backflushing would range from a few minutes to 2 hours. Water produced during routine backflushing would be conveyed via the new ASR Pump-to-Waste Pipeline to the existing Phase I ASR Pump-to-Waste System located at the intersection of General Jim Moore Boulevard and Coe Avenue. These discharges would be considered “water supply discharges” and would be conducted under the *General Waiver of WDRs for Specific Types of Discharges* (Resolution R3-2014-0041)

(General Waiver) (RWQCB, 2014). As such, discharges of backflush effluent would be subject to the conditions of the General Waiver, including the requirements that all discharges occur at distances greater than 100 feet from streams, wetlands, and other water bodies, and that appropriate management practices be implemented to preclude discharging to surface waters and surface water drainage courses. In addition, backflush effluent discharges would be subject to the condition that it would not have chlorine or bromine concentrations that could impact groundwater quality. Compliance with the conditions of the General Waiver would prevent the degradation of water quality during routine maintenance of the ASR-5 and ASR-6 Wells. The impact would be less than significant, and no mitigation is necessary.

Impact Conclusion

Discharges related to periodic maintenance of the subsurface slant wells and routine maintenance of the ASR-5 and ASR-6 Wells would be conducted in accordance with regulatory requirements designed to protect water quality. As a result, the impact would be less than significant for both facility components.

Mitigation Measures

None proposed.

Impact 4.3-7: Alteration of drainage patterns such that there is a resultant increase in erosion, siltation, or the rate or amount of surface runoff. (*Less than Significant*)

During construction of the various proposed MPWSP components, soil disturbance associated with grading and earthmoving operations could expose soils to stormwater runoff, which could result in onsite erosion and sediments being transported in stormwater runoff, subsequently resulting in downstream siltation. Following construction (operation phase), stormwater runoff volumes and rates generated from undeveloped, unpaved areas can increase considerably when drainage patterns are substantially altered, a site is paved, the impervious surface area is increased, and the ability of surface water to infiltrate the ground surface is reduced or eliminated. The addition of impervious surfaces or the alteration of drainage patterns (such as through grading) can increase peak stormwater flows, causing erosion or siltation onsite or downstream. The majority of the proposed facilities would be constructed below ground and would not increase impervious surfaces or alter long-term drainage patterns during operations in a manner that increases onsite or offsite erosion or siltation. As discussed in detail above (Impact 4.3-1), construction of the proposed project would be subject to the Construction General Permit requirements, which include preparation of a SWPPP as well as additional local requirements governing management of construction stormwater and the use of established BMPs for the management of erosion during construction activities. As described in Impact 4.3-1, preparation and approval of the SWPPP associated with the Construction General Permit would include site-specific erosion and sedimentation control practices. Incorporation of these permit requirements would ensure the implementation of BMPs and specific measures for the protection of water quality effective in minimizing the potential for erosion or siltation as a result of altered drainage patterns. The SWPPP also includes descriptions of the BMPs required to reduce pollutants, including sediment, in stormwater discharges after all construction phases have been completed at the site (post-construction BMPs). Since the proposed project would create new impervious surfaces at the aboveground facilities located throughout the project area, impacts related to altered drainage patterns, erosion, and siltation are assessed in detail for specific project components below.

Subsurface Slant Wells

The subsurface slant wells would be constructed in a previously disturbed portion of the CEMEX active mining area in the city of Marina. The 10 slant wells would be located at six sites along the back of the dunes: four sites (the test slant well site No. 1, and three new sites) would each have one slant well and two sites would have three slant wells at each (see **Figure 3-3**). Sites 1 through 6 would include the following aboveground facilities: one wellhead vault per slant well, mechanical piping (meters, valves, gauges), electrical control cabinet, and a pump-to-waste vault. The new permanent slant wells and associated aboveground infrastructure at Sites 2 through 6 would be constructed on a 5,250- to 6,025-square-foot graded pad located above the maximum high tide elevation.

Implementation of the subsurface slant wells at the CEMEX active mining area would result in a minor increase in impervious surface area. As indicated in **Table 4.3-6**, above, the subsurface slant wells would qualify as a Tier 4 project and CalAm would be required to ensure flows for the 2-year through 10-year storm events match pre-project flows. With mandatory compliance with the post-construction stormwater requirements, alterations in drainage patterns at the CEMEX active mining area would not result in substantial increases in erosion, siltation, or the rate or amount of surface runoff. The impact would be less than significant.

MPWSP Desalination Plant

The proposed MPWSP Desalination Plant site would disturb approximately 25 acres of a 46-acre undeveloped parcel located on Charles Benson Road, northwest of the MRWPCA Regional Wastewater Treatment Plant. The proposed improvements at the MPWSP Desalination Plant site would include laboratory and administration buildings, various treatment and storage facilities, as well as paved parking, driveways, and maintenance areas. The site would add approximately 15 acres of impervious surfaces, which would reduce stormwater infiltration onsite and could increase stormwater runoff from the site. If not managed, an increase in stormwater runoff could increase erosion and/or siltation downstream.

CalAm would be required to comply with the most recent post-construction stormwater control requirements (Central Coast RWQCB Resolution No. R3-2013-0032), which are enforced by the local jurisdictions in accordance with the MRSWMP and the NPDES Municipal Stormwater Permit for MS4s (described in Section 4.3.2, Regulatory Framework, above). As indicated in **Table 4.3-6**, above, the MPWSP Desalination Plant would qualify as a Tier 4 project and CalAm would be required to: incorporate Low Impact Development (LID) measures into site design, treat stormwater runoff, retain a portion of stormwater runoff from the site, and manage flows for the 2- through

10-year storm events such that they match pre-project flows. Post construction stormwater BMPs could include, but would not be limited to, the use of pervious concrete or pavement, bioswales, vegetated swales, buffer strips, and vegetated retention ponds. CalAm would be required to prepare and implement a post-construction SWMP that details the maintenance schedule for post-construction BMPs. With mandatory compliance with the post-construction stormwater requirements, alterations in drainage patterns at the MPWSP Desalination Plant site would not result in substantial increases in erosion, siltation, or the rate or amount of surface runoff. The impact would be less than significant.

All Pipelines

Once constructed, all of the proposed pipelines would be located entirely underground and the surface along the pipeline alignments would be restored to pre-construction conditions. No substantial long-term changes in drainage patterns would result from implementation of the proposed pipelines. Therefore, no impact would result.

ASR-5 and ASR-6 Wells

The proposed ASR-5 and ASR-6 Wells at the Fitch Park military housing area would add a total of approximately 2,000 to 2,500 square feet of impervious surface due to the addition of the concrete pump houses, electrical transformer, and access driveway for maintenance vehicles. It is assumed that the ASR-5 and ASR-6 Wells would qualify as a Tier 1 project under the post-construction stormwater management requirements (see **Table 4.3-6**, above) and CalAm would be required to implement LID elements into the site design. With adherence to the post-construction stormwater management requirements, this negligible increase in impervious surfaces would not significantly impede infiltration, alter drainage patterns, or increase erosion and siltation. Therefore, the impact would be less than significant.

Carmel Valley Pump Station

The Carmel Valley Pump Station would be enclosed in a 500-square-foot single-story building along with a 100-square-foot electrical control building outside of the pump station building. These structures would add approximately 600 feet of impervious surfaces. These negligible increases in impervious surfaces would not result in a substantial change in drainage patterns, erosion, or siltation. Therefore, the impact would be less than significant.

Impact Conclusion

The subsurface slant wells, MPWSP Desalination Plant, and ASR-5 and ASR-6 Wells would be subject to the post-construction stormwater management requirements of the municipal stormwater permit and CalAm would be required to implement post-construction stormwater BMPs into the final site designs. With adherence to the post-construction requirements, the existence and operation of these facilities would result in a less than significant impact related to changes in drainage patterns, increased soil erosion, and siltation. Implementation of the Carmel Valley Pump Station would result in a less than significant impact. No impact would result from implementation of the proposed pipelines.

Mitigation Measures

None proposed.

Impact 4.3-8: Alteration of drainage patterns such that there is an increase in flooding on- or offsite or the capacity of the stormwater drainage system is exceeded. (*Less than Significant*)

During construction of the various components of the proposed project, grading and earthmoving operations could alter local drainage patterns and redirect or concentrate stormflows, which could result in increased risks related to onsite and/or downstream (offsite) flooding, especially if stormwater conveyance capacity is exceeded in existing or planned stormwater systems. Following construction (operation phase) stormwater runoff volumes and rates can increase significantly when drainage patterns are substantially altered or when the impervious surface area is increased.

As discussed in detail under Impact 4.3-7, implementation of the proposed facilities would not result in substantially altered drainage patterns or increased stormwater runoff as a result of increased impervious surfaces. The subsurface slant wells, and the MPWSP Desalination Plant would qualify as a Tier 4 project and CalAm would be required to ensure flows for the 2-year through 10-year storm events match pre-project flows (**Table 4.3-6**). Other project components (ASR-5 and ASR-6 Wells) would qualify as a Tier 1 project and CalAm would be required to implement LID elements into the final site design (**Table 4.3-6**), ensuring stormwater runoff is not increased such that flood risks on- or offsite are increased or stormwater conveyance structure capacity is exceeded. Further, the existing ASR settling basin at the intersection of General Jim Moore Boulevard and Coe Avenue would be used for settling of backflush effluent from the wells and would not result in flooding or affect the capacity of the stormwater drainage system. Pipelines would be located entirely underground and the surface along the pipeline alignments would be restored to pre-construction conditions. No changes in drainage patterns would result from implementation of the proposed pipelines. Implementation of the Carmel Valley Pump Station would add approximately 600 square feet of impervious surfaces and land uses in the vicinity of the pump station site include low density residential development and open space. This negligible increase in impervious surfaces would not result in substantial impacts related to changes in drainage patterns, flooding, or flows in excess of the stormwater drainage system.

With mandatory compliance with the post-construction stormwater management requirements, alterations in drainage patterns resulting from implementation of the proposed facilities would not result in substantial alterations in drainage patterns such that flooding on or offsite were increased, nor the capacity of stormwater drainage systems exceeded. The impact would be less than significant.

Mitigation Measures

None proposed.

Impact 4.3-9: Impedance or redirection of flood flows due to the siting of project facilities within a 100-year flood hazard area. (*Less than Significant*)

The subsurface slant wells and portions of the Source Water Pipeline, Castroville Pipeline, and new Transmission Main would be constructed in a 100-year flood hazard area.

Subsurface Slant Wells

As shown in **Figure 4.3-2**, the subsurface slant wells and associated structures would be located within or adjacent to the 100-year coastal flood hazard area. The subsurface slant wells would be constructed near the western terminus of the CEMEX access road and just south of the CEMEX settling ponds. The electrical control cabinet at each well site (Figure 3-3a) would be a single-story structure 16 feet long by 7 feet wide. Any flood flows associated with 100-year coastal flooding diverted by the electrical control cabinet would be diverted to the sandy areas immediately surrounding the cabinet, within the CEMEX active mining area, and would be temporary in nature, highly localized in extent, and would not affect other properties or structures or otherwise interfere with CEMEX operations. The wellheads and supporting structures would extend at a maximum height of 2 feet above the ground surface and would not impede or redirect flood flows in the area. Therefore, the impact would be less than significant.

Source Water Pipeline, Castroville Pipeline, and New Transmission Main

Portions of the Source Water Pipeline and new Transmission Main in Marina, and the Castroville Pipeline in unincorporated Monterey County would be located within 100-year coastal flood hazard areas (see **Figure 4.3-3**). However, once constructed, these pipelines would be located underground and would not impede or redirect surface flood flows in the area. The impact would be less than significant.

All Other Project Components

None of the other project components are located within a 100-year flood hazard area. Therefore, no impact related to the impedance or redirection of flood flows in a 100-year flood hazard area would result.

Impact Conclusion

Portions of the Source Water Pipeline, new Transmission Main, and Castroville Pipeline would be constructed in a 100-year flood hazard area. However, these facilities would be placed underground would not impede or redirect flood flows. The impact would be less than significant for the subsurface slant wells, and Source Water Pipeline. No impact would result from implementation of all other proposed facilities because none of the other project components are located within a 100-year flood hazard area.

Mitigation Measures

None proposed.

Impact 4.3-10: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to a tsunami. (*Less than Significant*)

Tsunami damage is typically confined to low-lying coastal areas. As shown in **Figure 4.3-2**, the near-shore margins of Monterey County, including coastal portions of Marina, Seaside, and Monterey, are subject to flooding in the event of a tsunami. The subsurface slant wells in Marina, and the Castroville Pipeline in unincorporated Monterey County would be located in areas subject to flooding from a tsunami.

Subsurface Slant Wells

All facilities in the CEMEX active mining area would be designed to withstand inundation. As a result, the slant wells would not be subject to a significant risk of damage from flooding in the event of a tsunami. The slant wells would be operated remotely using a SCADA system, with routine site visits by facility operators to monitor operations. Because the presence of onsite personnel would be minimal, operation of the subsurface slant wells would not expose facility operators to significant tsunami hazards. The impact would be less than significant for the subsurface slant wells.

Castroville Pipeline

Because the Castroville Pipeline would be located underground and designed to withstand inundation, the pipeline would not be subject to a significant risk of damage from flooding in the event of a tsunami.

Site visits from facility operators associated with pipeline operations and maintenance would be limited to annual inspections of the cathodic protection system, testing and servicing of valves, vegetation maintenance, and repairs of minor leaks in buried pipeline joints or segments. Pipeline operations and maintenance would not expose personnel or structures to significant risks from flooding in the event of a tsunami. The impact would be less than significant.

All Other Project Components

None of the other project components are located within a tsunami inundation zone. Therefore, no impact would result.

Impact Conclusion

The MPWSP would not expose people or structures to a significant risk of loss, injury, or death from flooding due to a tsunami. The impact would be less than significant for the subsurface slant wells, and Castroville Pipeline. For all other facilities, no impact would result.

Mitigation Measures

None proposed.

Impact 4.3-11: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise. (*Less than Significant*)

Coastal flooding impacts would be short-term (from storm tides) and long-term (from sea level rise). Short-term impacts from coastal flooding could occur during 100-year storm events and include coastal erosion, which is discussed under Impact 4.2-10 in Section 4.2, Geology, Seismicity, and Soils, and impedance or redirection of flood flows, which is discussed under Impact 4.3-9, above. This impact focuses only on the long-term impacts related to exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise. Detailed analyses of coastal surface water elevations and erosion associated with sea level rise are presented in Appendix C.

The proposed project could expose project facilities to long-term flooding from sea level rise. The subsurface slant wells, the northernmost portion of the MPWSP Desalination Plant site, and portions of the Source Water Pipeline would be located in areas that could be subject to sea level rise. However, because the subsurface slant wells and the two pipelines would be constructed underground and designed to withstand inundation, these facilities would not be subject to a significant risk of damage from flooding due to sea level rise. The proposed aboveground facilities at the 40-acre MPWSP Desalination Plant site would be constructed on the upper terrace of the site and at elevations higher than the predicted elevations associated with the 2100 sea level rise of 55 inches (Figure 4.3-3). The desalination facilities would be designed so as to minimize the risk from flooding due to sea level rise. The impact would be less than significant.

Subsurface Slant Wells

The subsurface slant wells in Marina would be located in the CEMEX active mining area. This area is subject to sea level rise as shown in **Figure 4.3-3**. All facilities in the CEMEX active mining area would be designed to withstand inundation. Therefore, the slant wells would not be subject to a significant risk of damage from flooding due to sea level rise. The impact would be less than significant.

MPWSP Desalination Plant

According to reports related to climate change and sea level rise (see the discussion of Coastal Flooding and Sea Level Rise under Section 4.3.1.4, above, for further details), during the lifetime of the desalination facilities (approximately 50 years), the sea level in the project vicinity is projected to rise by a total of 27.5 inches (2.3 feet). Further, the mean sea level rise trend in Monterey Bay is estimated to be increasing by 0.053 inches per year (NOAA, 2013b).

The MPWSP Desalination Plant site is located in close vicinity of the areas subject to flooding from sea level rise (see **Figure 4.3-3**). The MPWSP Desalination Plant would be located at elevations between 85 and 110 feet above msl, which is greater than the sea level rise of approximately 2.3 feet estimated to occur during the lifetime of the proposed project (the next 50 years). Thus, the MPWSP Desalination Plant site facilities would not be subject to flooding and would not expose people or structures to risk from flooding due to sea level rise during the lifetime of the proposed project. Therefore, the impact on proposed project facilities would be less than significant.

Source Water Pipeline and Castroville Pipeline

Portions of the proposed Source Water Pipeline in Marina and the Castroville Pipeline in unincorporated Monterey County (see **Figure 4.3-3**) would be located in areas that would be subject to flooding from sea level rise. However, once constructed, the pipelines would be located underground and would not impede or redirect flood flows, nor be subject to a significant risk of flood damage from sea level rise. The impact would be less than significant.

All Other Proposed Facilities

None of the other proposed facilities would be located in areas that would be subject to flooding from sea level rise. No impact would result.

Impact Conclusion

The MPWSP would not expose people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise. The impact would be less than significant for the subsurface slant wells, MPWSP Desalination Plant, and Source Water Pipeline, and Castroville Pipeline. All other proposed facilities would have no impact.

Mitigation Measures

None proposed.

4.3.6 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects.

Impact 4.3-C: Cumulative impacts related to surface water hydrology and water quality (*Less than Significant with Mitigation)*

The geographic scope for potential cumulative surface hydrology and water quality impacts consists of the project area and surrounding Salinas River and Carmel River watershed lands as well as marine waters in Monterey Bay. The analysis of potential cumulative impacts on hydrology and water quality considers those cumulative projects listed in **Table 4.1-2** and shown in **Figure 4-1**. The analysis focuses on cumulative adverse effects on water quality associated with construction and operations. The timeframe during which the MPWSP could contribute to cumulative surface water hydrology and water quality effects includes the 24-month construction period, as well as the estimated 40-year operations phase.

Of not, on Saturday, January 20, 2018, MBNMS was notified of a sewage spill into MBNMS from the Monterey Regional Water Pollution Control Agency (MRWPCA), the local wastewater treatment facility. The original estimate indicated a discharge from one million gallons to 4.4 million gallons. Monterey County Department of Environmental Health closed the beaches from the Salinas River mouth to Carmel Bay due to the southerly currents and very large ocean swell at the time. Eleven samples for fecal indicator bacteria and ammonia were collected offshore at the outfall pipe and at more than seven local beaches on January 20th. All sample results were within acceptable regulatory (USEPA Ambient Water Quality Criteria) limits except for one unrelated to the discharge at Del Monte beach in the City of Monterey. MBNMS staff requested that MRWPCA submit samples for additional analysis of raw sewage for all California Ocean Plan Table 1 constituents to determine potential impacts on marine resources. MRWPCA reported that the spill resulted from the failure of an analog input card which caused alarms and bar screen rakes to fail, thus releasing sewage to overflow a 300,000-gallon sump, thereby bypassing any treatment and discharging directly into Monterey Bay for 9.25 hours. Engineering analysis later determined that approximately 2.8 million gallons of untreated sewage entered Monterey Bay. Subsequently, MRWPCA undertook multiple actions aimed at preventing future spills of this nature, including but not limited to: installing cameras, level sensors, updated software, and additional staff conducting rounds after hours. Sampling and information collection regarding the extent and potential impacts of the spill is ongoing. As noted in Section 4.3.1.3, the processes influencing the physical mixing of Bay receiving waters with inputs from other sources is enhanced by turbulence induced by currents and waves. While current velocities can be different throughout the water column, tidally-driven currents can cause large pulses of water movement. Wave action, particularly during stormy periods, can vertically stir the water. The ocean water density and the physical processes (waves and currents) vary as a result of seasonal weather cycles and can also be severely modified by global ocean climate events. As noted by MBNMS, (2018) residence times in Monterey Bay varied between 2 and 12 days, with a mean of around 6 days (which is approximately the time required for a water parcel to travel 50km at an average speed of 10cm/sec). Therefore, the incident is not anticipated to have any long-term residual impact on the water quality of Monterey Bay in the year 2021 that would affect or change the EIR/EIS conclusion of impacts on water quality resulting from implementation of the proposed project and the spill was not assessed in the cumulative scenarios.

Impacts on Surface Hydrology and Surface Water Quality during Construction

Construction activities associated with the MPWSP could result in the degradation of water quality from increased soil erosion and associated sedimentation of water bodies due to stormwater runoff, as well as accidental releases of hazardous materials (see Impact 4.3-1). In addition, discharges of dewatering effluent from excavated areas and treated water and disinfectant from pipelines could adversely affect water quality (see Impacts 4.3-2 and 4.3-3).

Nearly all the cumulative projects identified in **Table 4.1-2** involve excavation and use of heavy equipment during construction. Therefore, the cumulative projects in **Table 4.1-2** have the potential to degrade surface water quality as a result of construction-related soil erosion or accidental discharges of hazardous construction chemicals. A number of the cumulative projects could also require construction dewatering. Cumulative projects that include the installation of new pipelines, such as the Salinas Valley Water Project Phase II, Granite Ridge Water Supply Project, DeepWater Desal, RUWAP, Pacific Grove Local Water Project, Pacific Grove Recycled Water project, Monterey-Pacific Grove ASBS Stormwater Management Project, and Peoples'

Moss Landing Desal Project (Nos. 1, 33, 34, 31, 22, 23, 45, and 57), would likely involve discharges of treated water produced during pipeline draining and disinfection. In addition, the CEMEX Removal Plan (No. 63), which requires the removal of all machinery and structures associated with sand mining operations, must include a description of all temporary run-off and erosion control measures to be used during removal activities. The relevant cumulative projects would have control measures (described below) such that there would be no combined cumulative impact related to the degradation of water quality.

As described in Impact 4.3-1, projects that would disturb more than one acre of soil (including nearly every project in **Table 4.1-2**) would be subject to the National Pollutant Discharge Elimination System (NPDES) Construction General Permit requirements. The NPDES Construction General Permit requirements are themselves measures based, in part, on the consideration of cumulative effects on receiving waters. Such requirements include the preparation and implementation of project-specific Stormwater Pollution Prevention Plans (SWPPPs). The SWPPPs would include specific erosion and stormwater control measures to prevent substantial adverse effects on water quality during construction and would be implemented throughout the duration of construction activities. Nearly every project in the cumulative scenario would be required to implement a SWPPP. As a result, the effects of the MPWSP would not be expected to combine with those of cumulative projects to cause a cumulatively significant water quality impact from increased soil erosion and sedimentation, or inadvertent releases of toxic chemicals during general construction activities. Therefore, no overall cumulatively significant effect would occur and the project’s contribution to the cumulative impact would be less than significant.

As with the MPWSP, the cumulative projects in **Table 4.1-2** could also require dewatering during construction to create a dry work area if groundwater is encountered in open excavations. In addition, for cumulative water supply projects, segments of existing pipelines would need to be drained and disinfected prior to being returned to service and newly installed pipelines would need to be disinfected before being put into service. The dewatering effluent from open excavations, treated water from the draining of existing pipelines, and the effluent generated from disinfection of pipelines could be discharged to the storm drainage system or to vegetated upland areas. As discussed in Impacts 4.3-2 and 4.3-3, these discharges would be regulated by the Regional Water Quality Control Board (RWQCB) and would be subject to *General Waste Discharge Requirements for Discharges with a Low Threat to Water Quality* (General WDRs). The General WDRs include measures to bring such effluent into conformance with State standards prior to discharge (e.g., neutralizing residual chlorine and reducing total dissolved solids). For the discharges of treated water and disinfection effluent, compliance with the General WDRs and the conditions therein would protect water quality in receiving water bodies. Since all other water supply projects that involve pipelines would also need to comply with the General WDRs, the effects of MPWSP treated water and disinfection effluent discharges when combined with those of cumulative projects would not cause a cumulatively significant effect on water quality. Thus, the proposed project’s contribution to the cumulative impact would be less than significant.

However, if the MPWSP's dewatering effluent from open excavations were to contain materials from previous spills or leaks, discharges of contaminated dewatering effluent to vegetated upland areas or the local storm drain system would result in a significant impact, which also could result in a significant contribution to a significant cumulative surface water quality impact. To reduce the potential for residual contaminants in the MPWSP dewatering effluent to adversely affect water quality, Impact 4.3-2 calls for implementation of **Mitigation Measure 4.7-2b (Soil and Groundwater Management Plan)**, which would require construction contractors to comply with all relevant environmental regulations and plan for the safe and lawful disposal of contaminated groundwater, when encountered. With implementation of **Mitigation Measure 4.7-2b**, the residual effects of MPWSP discharges of dewatering effluent would not be expected to combine with that of projects in the cumulative scenario to cause a significant cumulative impact. Therefore, with implementation of mitigation, the proposed project's contribution to any cumulative impact would be less than significant.

The water extracted during drilling and development of the subsurface slant wells and ASR-5 and ASR-6 Wells would be disposed in accordance with the RWQCB's *General Waiver of WDRs for Specific Types of Discharges* (General Waiver). The General Waiver would allow the extracted water to be discharged to upland areas after allowing suspended solids to settle out (e.g., routing to temporary holding tank). The conditions of the General Waiver would minimize the potential for water quality degradation by regulating the types and concentrations of pollutants in the discharges, and restricting the location and method of disposal. However, dewatering of contaminated groundwater could result in a significant impact if released into the environment, which also could result in a cumulatively significant contribution to a significant cumulative surface water quality impact. With implementation of **Mitigation Measure 4.7-2b (Soil and Groundwater Management Plan)** and mandatory compliance with the NPDES Construction General Permit, General Waiver, and General WDRs, residual effects of MPWSP discharges of water extracted during well drilling and development would not be expected to combine with those of projects in the cumulative scenario to cause a significant cumulative impact. Therefore, with implementation of mitigation, the proposed project's contribution to any cumulative impact would be less than significant.

Impacts on Surface Hydrology and Surface Water Quality during Operation and Maintenance

Operation and maintenance of MPWSP facilities could degrade surface and marine water quality during the anticipated approximately 40-year operations phase as a result of altered drainage patterns, operational discharges, flooding and flood hazards.

Discharge from the Operation of the MPWSP Desalination Plant

The geographic area associated with the assessment of cumulative water quality impacts from operation of the MPWSP is Monterey Bay. For water quality impacts related to the discharge of brine from the operation of the MPWSP Desalination Plant, the cumulative projects whose water quality impacts could overlap with those of the MPWSP include the Sand City Coastal Desalination Plant (No. 6), RUWAP Desalination Element (No. 31), RUWAP Recycled Water

Project (No. 35), Monterey Bay Regional Water (DeepWater Desal) Project (No. 34), and The People's Moss Landing Water Desal Project (People's Project; No. 48). The Sand City Coastal Desalination Plant was completed in 2010. As such, the Sand City Coastal Desalination Plant represents a "past/present" project for purposes of cumulative analysis and water quality impacts relating to MPWSP operations associated with the Sand City Coastal Desalination Plant are reflected in the baseline used for the project-level and the cumulative analysis. As proposed by their respective applicants, both the DeepWater Desal Project and the People's Project would develop supplemental water supplies to serve the same customers in the Monterey Peninsula (in CalAm's Monterey District service area). The People's Project is proposed as an alternative to the MPWSP such that both the People's Project and the proposed project would not both be implemented since their purposes and customers would be largely the same. Therefore, this EIR/EIS assumes that the People's Project is not a reasonably foreseeable project in the cumulative scenario relevant to the proposed project. Further, for purposes of the analysis presented here, consideration of the DeepWater Desal project represents the more conservative worst-case cumulative scenario since this project is larger than the People's Project. However, in the case of DeepWater Desal, water could be provided to other off-takers in Santa Cruz County or the City of Salinas, and the project could be approved in addition to the proposed project. Therefore, the cumulative impacts of the DeepWater Desal Project are considered as they relate to the provision of water to Santa Cruz County and the City of Salinas.

The significance thresholds identified for the analysis of cumulative water quality impacts from the brine discharge are listed below. A cumulative impact would occur if the combined impact from the cumulative projects considered here would result in an exceedance of the following significance standards:

- Exceed the receiving water limitation for salinity of 2 ppt at the edge of the Brine Mixing Zone (BMZ) established in the Ocean Plan.
- Exceed water quality objectives established in the Ocean Plan at the edge of the zone of initial dilution (ZID).

Implementation of the MPWSP would require the MRWPCA NPDES permit to be amended to incorporate the brine discharge from the MPWSP Desalination Plant, where the brine and its combination with the wastewater would be subject to the water quality requirements in the amended NPDES Permit, which would incorporate the Ocean Plan water quality objectives and the receiving water limitation for salinity from operation of a new desalination plant. Further, operation of the MPWSP would be required to adhere to all monitoring and reporting requirements prescribed in the Ocean Plan relating to operational discharges and receiving water characteristics as well as assessments relating to impacts on all forms of marine life.

As discussed under Impact 4.3-4, modeling of the MPWSP brine discharge from the MRWPCA outfall indicates that the brine effluent would be below the 2 ppt salinity significance threshold under the worst case scenario. Additional modeling (ESA, 2015) further indicates that the brine plume would generally reach ambient salinity levels at a distance of approximately 0.26 miles from the outfall diffuser under worst case conditions. All existing and proposed outfalls associated with the cumulative projects (listed above) are greater than 0.26 mile from the MRWPCA outfall. Therefore, the likelihood of discharge plumes from different outfalls or their ZIDs intersecting or merging and resulting in exceedances of Ocean Plan defined water quality objectives or receiving water salinity limitations and adversely affecting beneficial uses of receiving waters (Monterey Bay) is very low.

At the project level, it is conservatively determined that under the assessed discharge scenarios, operational discharges from implementation of the MPWSP could exceed Ocean Plan water quality objectives for certain constituents. This would result in a significant impact, and because the Ocean Plan water quality objectives are based on the effects of cumulative impacts on ocean water quality, an exceedance of water quality objectives also would represent a cumulatively significant contribution to a potential significant cumulative impact. The proposed project's contribution would be minimized to a less-than-significant level by implementation of **Mitigation Measure 4.3-4 (Operational Discharge Monitoring, Analysis, Reporting, and Compliance)** and **Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives)**.

As discussed under Impact 4.3-5, future water quality testing and analysis, required as part of the NPDES permit process, would determine whether operational discharges under the MPWSP Project comply with Ocean Plan water quality objectives. The water quality testing and analysis would be conducted as per protocol approved by the RWQCB. **Mitigation Measure 4.3-4 (Operational Discharge Monitoring, Analysis, Reporting, and Compliance)** requires CalAm to implement a comprehensive Monitoring and Mitigation Plan consistent with the requirements of the Ocean Plan (described in detail in Section 4.3.2.2) that would set forth appropriate response thresholds and corrective actions that would be required if the acquired data indicated deleterious effects to receiving water quality or marine biological resources from the proposed MPWSP operational discharges. **Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives)** would require data gathering to determine baseline conditions and compliance with Ocean Plan water quality objectives and would involve employing design features and/or operational measures to achieve the required minimum dilution of the discharge at the edge of the ZID to ensure compliance with Ocean Plan water quality objectives. With implementation of **Mitigation Measure 4.3-4** and **Mitigation Measure 4.3-5**, the MPWSP would comply with NPDES permit requirements as well as all water quality objectives detailed in the Ocean Plan. The requirements of NPDES permits, which incorporate the Ocean Plan water quality objectives in the case of operational discharges from the MRWPCA outfall, are designed and intended to protect beneficial uses of receiving waters (i.e., Monterey Bay) from the effects of numerous potential sources of pollution, and are therefore protective against significant adverse cumulative impacts.

The brine discharge from the operation of the proposed MPWSP Desalination Plant would be subject to water quality requirements in the amended NPDES Permit for the discharge through the MRWPCA outfall. Any new or modified waste discharges to the bay, such as those proposed as part of the DeepWater Desal Project, are subject to the water quality requirements of the NPDES permit system, administered by the Central Coast RWQCB. Thus, operation of the cumulative projects that would result in waste discharge (listed above), including and similar to the proposed project would be subject to, and would be required to comply with, the regulatory requirements for the protection of the beneficial uses of Monterey Bay. The SWRCB establishes the regulatory limitations and guidance on compliance and continues to develop and administer regulations through the RWQCBs (the Central Coast RWQCB in the project area) to regulate the water quality of the waters of the U.S. The most recent amendment to the Ocean Plan (SWRCB, 2016) reflects the SWRCB's process of adapting to the need to regulate discharges from desalination projects. As also discussed above, the Ocean Plan objectives are incorporated into the NPDES permits issued to the dischargers by RWQCBs in the form of specific water quality requirements.

With mandatory compliance with the regulatory requirements and the NPDES effluent limitations, and implementation of mitigation measures, the cumulative impact from the discharges resulting from MPWSP and the projects in **Table 4.1-2** is therefore considered less than significant. Additionally, with implementation of mitigation measures, the proposed project's contribution to any cumulative water quality impact in Monterey Bay would be reduced to a level that is less than significant.

Discharges Related to Maintenance of Subsurface Intake Wells and ASR Wells

As discussed in Impact 4.3-6, the proposed project would require site disturbance for the slant well maintenance and routine cleaning of the ASR wells, which could result in discharges that would affect water quality. Site disturbance as part of the proposed project would occur once in five years and would be subject to the water quality control requirements of the Construction General Permit. Nearly all the cumulative projects identified in **Table 4.1-2** would involve site disturbance activities as part of construction and, as discussed above, would be subject to the Construction General Permit requirements, including implementation of a SWPPP to prevent substantial adverse effects on water quality during construction. As a result, the effects of the MPWSP would not be expected to combine with those of cumulative projects to cause a significant cumulative water quality impact from increased soil erosion and sedimentation, or inadvertent releases of toxic chemicals during general construction activities as part of the slant well maintenance. The proposed project would result in a less than significant contribution to this cumulative impact.

As discussed in Impact 4.3-6, as part of the ASR well maintenance, the proposed project would require backflushing of the accumulated sediment and turbid water in the two ASR wells. The duration of backflushing would range from a few minutes to 2 hours. The discharge of the backflushed effluent would be subject to specific requirements under the General Waiver of WDRs for Specific Types of Discharges (Resolution R3-2014-0041) to protect surface water quality. The projects in **Table 4.1-2** that would include maintenance-related discharges from water supply wells would be subject to and be required to comply with the water quality control requirements under the General Waiver. As a result, the effects of the proposed project would not be expected to combine with those of cumulative projects to cause a significant cumulative water quality impact from ASR well maintenance-related discharges. The proposed project would result in a less than significant contribution to this cumulative impact.

Alteration of Drainage Patterns and Non-point Source (Stormwater) Pollution

As discussed in Impacts 4.3-7 and 4.3-8, the MPWSP would require site disturbance in a manner that could alter drainage patterns and a net increase in impervious surface area at several project sites. Most of the projects identified in **Table 4.1-2** would also involve new impervious surfaces, which may alter site drainage. Alterations to site drainage could cause increased peak flows in creeks, exacerbate erosion and sedimentation, and result in greater non-point source pollution in downstream water bodies. Increased areas of impervious surfaces could also increase flooding of downstream waterways and cause runoff volumes to exceed stormwater conveyance system capacities.

However, operation of the proposed project would not represent a substantial land use change within the geographic scope when combined with the projects identified in **Table 4.1-2** as compared to current conditions at the site and in the surrounding area. The majority of the projects identified in **Table 4.1-2** are located within the urbanized portion of the Salinas River and Carmel River watershed lands (the geographic scope), and along the margin of Monterey Bay. The urbanized portions of these watershed lands no longer reflect natural historic conditions in terms of stormwater quality, volume, and drainage. The majority of the surfaces associated with the identified projects in the cumulative scenario, including most locations affected by the project, are covered with impervious surfaces and as a result stormwater runoff is generally rapid and surface infiltration rates are very low. Stormwater flows in the lower portions of the affected watershed lands adjacent to the proposed project are generated as runoff from paved surfaces and drain down gradient into stormwater conveyance systems and can contain pollutants typical of urbanized watersheds. While the proposed project and many of the projects identified in **Table 4.1-2** would result in some increase in impervious area, storm runoff volumes and rates as well as water quality generated during the operations phase would be similar to the existing runoff typical of urbanized watersheds.

Additionally, as discussed in Impacts 4.3-7 and 4.3-8, such developments would be required to comply with the Central Coast RWQCB Resolution No. R3-2013-0032, as implemented through the Monterey Regional Stormwater Management Program and NPDES Municipal Stormwater Permit. Adherence to these requirements would ensure potential effects of the MPWSP on site drainage would be less than significant. Projects constructed after March 6, 2014 that create or replace 2,500 square feet of impervious surface area are also subject to these requirements.

As the previously noted stormwater requirements are part of a regional program designed to address the potential cumulative effects of past, present, and foreseeable projects within the region, adherence to these requirements would ensure hydrology and water quality effects related to the alteration of drainage patterns would not cause a significant cumulative impact. The proposed project therefore would result in a less than significant contribution to any cumulative impact.

Risk of Loss, Injury, or Death due to Flooding

As discussed in Impacts 4.3-9, 4.3-10, and 4.3-11, the MPWSP would involve the siting of facilities in locations within or near areas subject to inundation due to 100-year flood, tsunami, and sea level rise. Specifically, the subsurface slant wells, and portions of the new Transmission Main, Castroville Pipeline, and Source Water Pipeline would be located in areas subject to inundation from 100-year flood and sea level rise. The subsurface slant wells would also be subject to inundation from tsunami. However, these facilities would be operated remotely and would not be regularly manned. Further, they would be designed to withstand periods of inundation. The MPWSP Desalination Plant would be constructed at elevations between 85 and 110 feet above mean sea level, well above areas of anticipated inundation due to flood, tsunami, and sea level rise. Some of the cumulative projects identified in **Table 4.1-2** and shown on **Figure 4-1** could have significant adverse effects related to flooding, tsunami, and sea level rise inundation. However, because the MPWSP components within such areas would be below grade, and with construction areas returned to their approximate pre-construction topography, they would have a less than significant contribution to any significant cumulative impacts associated with flooding, tsunami, and sea level rise.

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4.4 Groundwater Resources

This section analyzes the potential for the construction and operation of the Monterey Peninsula Water Supply Project (MPWSP or proposed project), which includes 10 slant wells at CEMEX, to adversely impact local and regional groundwater resources. Specifically, this analysis focuses on how the proposed subsurface slant wells and aquifer storage and recovery (ASR) system improvements would change the groundwater aquifers adjacent to the coast and further inland beneath the Salinas Valley, and would change the groundwater levels, flow direction, and water quality within the Seaside Groundwater Basin. The analysis is based on project-specific investigations of the various project components, the review of hydrogeologic models prepared for this and other projects, maps and hydrogeologic and geotechnical reports from the California

Department of Water Resources (DWR), United States Geological Survey (USGS), and the California Geological Survey (CGS), and the general plans for Monterey County and the local cities.

The CPUC received several comments on groundwater resources during the April 2015 Draft EIR review period. Some comments focused on significance thresholds and the characterization of baseline conditions. Comments addressed the use of computer modeling and requested an explanation of modeling methodology, specifically addressing the return water component and evaluating a zero return water scenario, while other comments addressed alternate methods of returning water to the basin. Certain commenters requested consideration of more extensive aquifer testing. Where relevant, the comments are addressed in this Impacts section. Note that some groundwater resource issues relative to water supply, return water, and the Monterey County Agency Act are addressed in Section 2.6, Water Rights.

As a result of comments received on the January 2017 Draft EIR/EIS, revisions have been made to this EIR/EIS section. Those changes include:

- *Revisions to Section 4.4.1.2 (Regional and Local Hydrogeology) to enhance the discussion of the proposed Settlement Agreement and the Hydrogeologic Working Group, to provide clarification on the confinement of the 180-FTE Aquifer, to describe the Deeper Aquifers (also referred to as the 900-Foot Aquifer) in the Salinas Valley Groundwater Basin, and to clarify hydrostratigraphy inland of the CEMEX site.*
- *Revisions to Section 4.4.1.4 (Groundwater Quality) to clarify Monterey County Water Resource Agency seawater intrusion monitoring thresholds, to include a discussion of seawater intrusion at the CEMEX site and to enhance the discussion of Electrical Resistivity Tomography (ERT) and Airborne Electromagnetics (AEM) surveys in the Salinas Valley Groundwater Basin.*
- *Revisions to Section 4.4.2.2 (Regulatory Framework – State) to add clarifying language on the Division of Water Rights Permit 20808 – Amended Permit for Diversion and Use of Water, and the Sustainable Groundwater Management Act (SGMA).*
- *Revisions to Section 4.4.3 (Evaluation Criteria) to include text to clarify the definition of a substantial net deficit in aquifer volume.*
- *Revisions to Section 4.4.4.2 (Groundwater Modeling) to include a discussion of the groundwater capture zone and update the discussion of Ocean Water Percentage.*
- *Revisions to Section 4.4.5.2 (Operations Impacts and Mitigation Measures, Impact 4.4-3) to add text with additional discussion and to include figures showing the relationship of the capture zone and cone of depression, to enhance the discussion of groundwater impacts on the deeper aquifers (also referred to as the 900-Foot Aquifer), to add clarifying text to describe MPWSP pumping effects on the CEMEX dredge pond, to add a discussion of MPWSP consistency with regulatory requirements including SGMA, and to clarify CalAm's degree of involvement with the US Army in the event that the MPWSP pumping impacts the OUCTP remediation plumes.*
- *Revisions to Applicant Proposed Measure 4.4-3 to include the 400-Foot Aquifer and the Deeper Aquifer to the monitoring program, in addition to other revisions requested by CalAm.*
- *Revisions to Section 4.4.6. (Cumulative Effects of Proposed Project) to enhance the discussion of MPWSP effects with other local and regional projects.*

4.4.1 Setting/Affected Environment

This section describes the setting for groundwater resources. The groundwater resources study area encompasses the northern portion of the Salinas Valley Groundwater Basin (SVGB) and the Seaside Groundwater Basin (SGB); specifically, the areas that could be affected by the installation and operation of the source water intake system and the ASR system (see **Figure 4.4-1**).

4.4.1.1 Terminology and Concepts

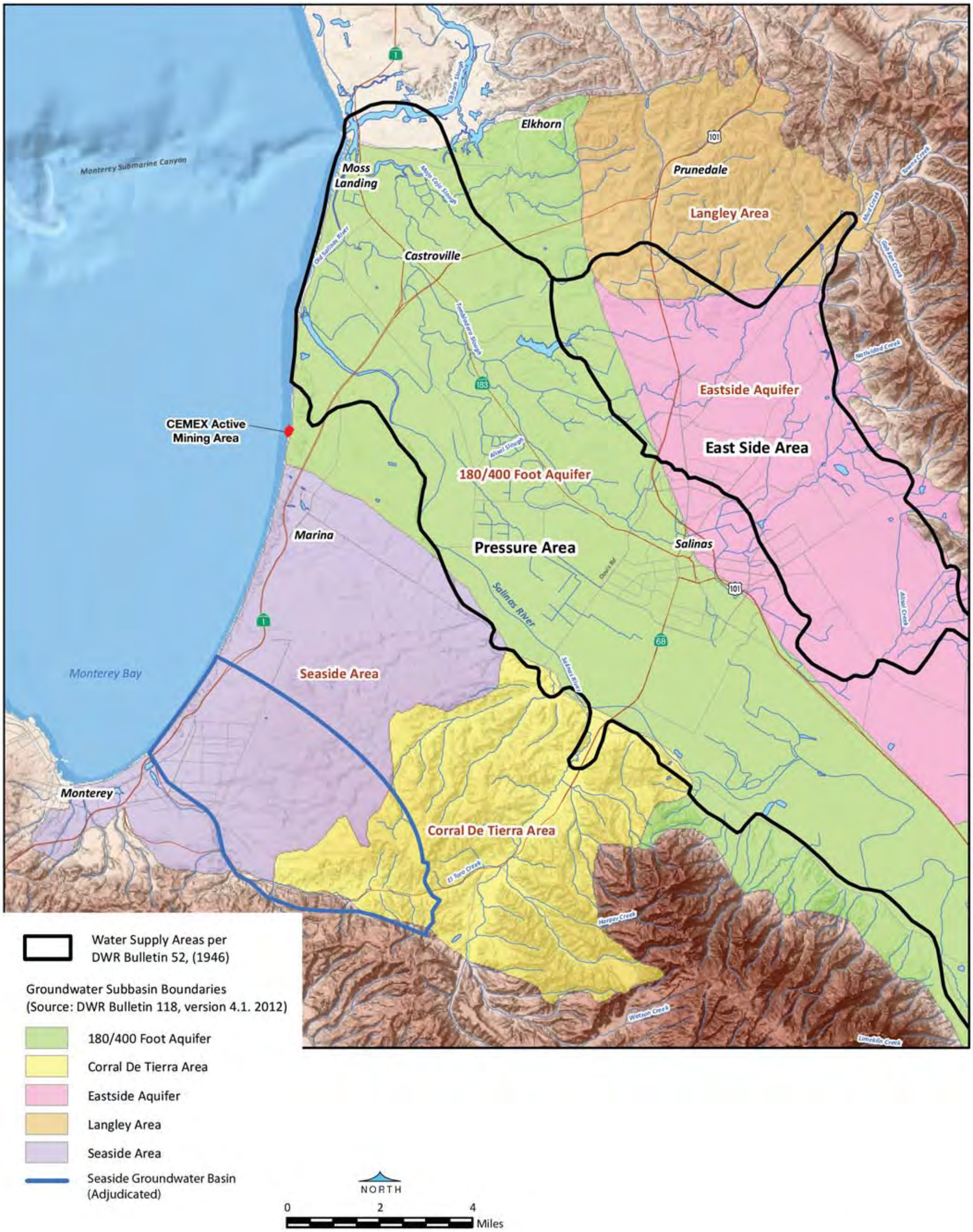
Groundwater is the water beneath the earth's surface, and hydrogeology is the study of how that water interacts with the underlying geologic units of rock and soil. Most groundwater occurs in sand and gravel units that were deposited by water (referred to as alluvium) and later covered by layers of clay, silt, sand, and gravel. Fluvial deposits refer to clay, silt, sand, and gravel that were laid down by rivers and streams as a result of bank erosion, a process in which the materials are transported and redeposited within the river system in the form of bars, points, and floodplains.

Coarse materials such as sand and gravel hold the most groundwater when saturated and are referred to as aquifers. Layers of finer-grained materials such as clay and silt restrict, but do not prevent, the flow of groundwater and are called aquitards. Aquifers can extend over many square miles and are called basins.

A groundwater basin is an aquifer or a stacked series of aquifers with reasonably well-defined boundaries in a lateral direction and a definable bottom. California's groundwater basins typically include one aquifer or a series of aquifers with intermingled aquitards. In general, groundwater basin boundaries are determined by physical attributes such as the lateral extent of aquifers, obstacles to flow such as bedrock or faults, and groundwater divides. A divide is defined by a line on either side of which groundwater moves in opposite directions. A groundwater divide, similar to a surface water divide, separates distinct groundwater flow regions within an aquifer.

Depending on the type of geologic unit overlying a water-bearing zone, groundwater can be unconfined or confined. The water table in an unconfined aquifer does not have a low-permeability aquitard lying over it, and thus pressure is exerted by the overlying water and the atmosphere. Groundwater under these unconfined conditions flows from areas of high groundwater elevation to areas of low groundwater elevation. The deeper portions of an unconfined aquifer can display the characteristics of a confined system due to the overlying thicker extent of groundwater and alluvial material. Under confined conditions, vertical flow from or to the aquifer is restricted by overlying aquitards. Groundwater under confined conditions flows from areas of higher heads[1] to areas of lower heads and is influenced by the pressure, weight, and confining nature of the overlying sediments; water entering the aquifers from areas of recharge; and water leaving the aquifers through natural discharge or through the pumping of supply wells. When a well penetrating a confined aquifer is pumped, internal aquifer pressure is reduced, which can in turn increase the flow of water towards the well.

1 Head or hydraulic head is the fluid potential for flow through a porous media.



SOURCE: Geoscience, 2013b

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Figure 4.4-1
Groundwater Basins and Areas in the Western Salinas Valley Groundwater Basin

4.4.1.2 Local and Regional Hydrogeology

This chapter's description of the groundwater system underlying the project area reflects the scientific community's current understanding of the subsurface geologic units and the depth and extent of the aquifers and aquitards.

Proposed Settlement Agreement and Hydrogeology Working Group

Several of the parties to the CPUC proceeding filed a motion with the CPUC in August 2012 to approve a Settlement Agreement that provides for the development, construction, operation, and financing of the Monterey Peninsula Water Supply Project (MPWSP).[2] The Settlement Agreement provided that the parties would support the issuance of a Certificate of Public Convenience and Necessity (CPCN) for the MPWSP, subject to certain conditions. Support by five of the parties depended on the resolution of certain issues. The Salinas Valley Water Coalition (SVWC), Monterey County Farm Bureau (MCFB), LandWatch Monterey County, and Citizens for Public Water were concerned about potential harm from CalAm's pumping of source water on the Salinas Valley Groundwater Basin (SVGB) and its users. Their CPCN support was therefore, contingent on resolving certain source water issues to be informed by the Hydrogeologic Study and the Technical Report provided for in the Settlement Agreement (HWG, 2017; see Appendix E3).

The settling parties agreed that hydrologists and technical teams representing CalAm and the SVWC would collaborate with other experts to develop a joint workplan, consistent with California State Water Resources Control Board (SWRCB) recommendations, for the MPWSP's proposed source water intake sites. The "Hydrogeologic Study" outlines that technical group's agreed-upon process and procedures for obtaining information on what effects the MPWSP may have on the SVGB and its users.

The technical group is referred to as the Hydrogeologic Working Group (HWG). The HWG, which was developed to serve as an internal peer review group, reviewed data and analyses and prepared investigation documents. Since its initial meeting in April 2013, the HWG has publically shared technical data (available at https://www.watersupplyproject.org/) and recommendations regarding locations of the subsurface investigations, procedures and protocols for investigation, groundwater model construction, and data analysis. The MPWSP Hydrogeologic Investigation Workplan provided a phased approach to progressively investigate the hydrogeology and the potential effects of the proposed project on aquifers from the use of subsurface slant wells for obtaining feedwater supply. Recommendations were included in the workplan. In accordance with the Settlement Agreement, the final draft of the workplan, dated December 2013, incorporated comments and recommendations by members of the HWG, and covered the investigative steps needed to evaluate the project impacts. The final workplan formed the basis of data collection and analysis of all work

2 The settling parties include the California American Water Company (CalAm), Citizens for Public Water, City of Pacific Grove, Coalition of Peninsula Businesses, County of Monterey, Division of Ratepayer Advocates, LandWatch Monterey County, Monterey County Farm Bureau (MCFB), Monterey County Water Resources Agency (MCWRA), Monterey Peninsula Regional Water Authority (MPRWA), Monterey Peninsula Water Management District, Monterey Regional Water Pollution Control Agency, Planning and Conservation League Foundation, Salinas Valley Water Coalition (SVWC), Sierra Club, and Surfrider Foundation. Such a proposed settlement agreement is not effective unless and until the CPUC embraces it as part of action on the project, and the CPUC may revise aspects of a proposed settlement agreement.

completed to date (see Appendix E3, Section 2.1), became the hydrogeology investigation roadmap, and resulted in the implementation of the fieldwork and modeling efforts described in the approach to analysis, Section 4.4.4.

In support of the CEQA/NEPA review process, work products developed by the HWG were peer reviewed by certified hydrogeologists from Environmental Science Associates and hydrogeologists/groundwater modelers from HydroFocus, Inc. The CEQA/NEPA team peer-reviewed all data and findings developed by the HWG, provided comments, and recommended changes prior to incorporating the hydrogeologic information and data into the body of technical information necessary to complete the groundwater analysis in the EIR/EIS.

The following sections describe the groundwater basins, the aquifers and aquitard contained within those basins, and the groundwater system underlying the subsurface intake system and the ASR system.

Salinas Valley Groundwater Basin

The Salinas Valley lies within the southern Coast Ranges, between the San Joaquin Valley and the Pacific Ocean, and is drained by the Salinas River. Extending approximately 150 miles from the La Panza Range north-northwest to its mouth at Monterey Bay, the valley is bound on the west by the Santa Lucia Range and Sierra de Salinas, and on the east by the Gabilan and Diablo Ranges. The 560-square mile Salinas Valley Groundwater Basin (SVGB)[3] underlies the Salinas Valley (MCWRA, 2006). The Monterey Bay acts as the northwestern boundary of the SVGB (Brown and Caldwell, 2015). The SVGB contains 10,000- to 15,000-foot-deep deposits of marine and terrestrial clay, sand, silt, and gravel as old as 65 million years (DWR, 2004a). The proposed project components associated with groundwater extraction would be located primarily within the 84,400-acre, 132-square-mile subarea of the SVGB known as the 180/400-Foot Aquifer Subbasin (DWR, 2004a).[4] The 180/400-Foot Aquifer Subbasin boundaries generally coincide with those of the SVGB Pressure Area (or Subbasin) traditionally recognized by the Monterey County Water Resources Agency (MCWRA) and California Department of Water Resources. The hydrologic boundaries of the Pressure Area are the Elkhorn Slough to the north, the East Side Area to the east, the Seaside Basin to the south, and the Pacific Ocean to the west. The boundaries and names of the basins have been updated to reflect the currently available information, as shown on **Figure 4.4-1**. This figure illustrates the updated basin boundaries in the western part of the SVGB, which were represented in the Salinas Valley Integrated Surface-Groundwater Model (SVIGSM) results and utilized in the modeling conducted for the proposed project (HydroFocus, 2016). Subsequent to the publication of the Draft EIR/EIS, the California Department of Water Resources made further changes by designating the area in between the Pressure Area (now called Salinas Valley Basin, Subbasin 180/400-Foot Aquifer) and the adjudicated Seaside Groundwater Basin as the Monterey Subbasin of the SVGB. In this EIR/EIS, the primary area of study within the SVGB is within the Pressure Area.

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3 The Salinas Valley Groundwater Basin is also referred to as the Salinas River Groundwater Basin.
4 The 180/400-Foot Aquifer subbasin includes three water bearing units, the 180-Foot and the 400-Foot Aquifers, named for the average depth of each aquifer, and the deeper aquifers (see description below) (USGS, 2011).

Pressure Area Aquifers and Aquitards

Water-bearing geologic formations present within the Pressure Area include: Quaternary Alluvium (including the Dune Sands and Terrace Deposits), Aromas Sand, Paso Robles Formation, Purisima Formation, Santa Margarita Sandstone, and Monterey Formation. Not all geologic units are present in all areas. Section 4.2, Geology, Soils and Seismicity, provides a detailed description of these geologic units and **Table 4.4-1**, below, summarizes the characteristics as they relate to groundwater storage.

TABLE 4.4-1
SUMMARIZED CHARACTERISTICS OF WATER BEARING GEOLOGIC UNITS

Geologic Unit (Listed youngest to oldest)	Geologic and Groundwater Storage Characteristics
Quaternary Alluvium	The Younger and Older Dune Sands. Younger, sparsely vegetated, active dunes are present along the coastline. Older dune deposits with more established vegetation are present inland. Shallow groundwater is not expected within the elevated dune deposits, except in localized low-lying areas along the coastline.
Terrace Deposits	Former alluvial fan and river floodplain deposits — which may also include marine terrace deposits — that generally consist of sand with some gravels. Terrace deposits at the CEMEX mining facility range from 150 to 163 feet in thickness.
Aromas Sand	Both older river deposits and younger windblown deposits of unconsolidated, brown to red sands with interbeds of clay and poorly sorted gravels.
Paso Robles Formation	Series of fine-grained, oxidized sand and silt beds that contain gravel beds interbedded with some calcareous beds. The formation is inter-fingered with the lower portion of the Aromas Sand and the upper portion of the Purisima Formation. The Paso Robles Formation is present at depths ranging from less than 100 feet to 600 feet in the northern portion of the project area.
Purisima Formation	Layered sand, silt, clay, shale, and some gravel deposited in near-shore and far-shore marine environments. The basal, or lowermost, unit of the Purisima Formation consists of relatively impermeable clay and shale.
Santa Margarita Formation	Marine, coarse-grained sandstone that overlies the Monterey Formation. Relatively small pieces of this unit are present beneath the project area in the Seaside vicinity at depths of about 800 feet deep just north of the Ord Terrace Fault and about 500 feet below the ground surface in between the Ord Terrace and Seaside Faults.
Monterey Formation	Marine sedimentary unit generally consisting of siliceous and diatomaceous interbedded layers of mudstone, siltstone, sandstone, and claystone. Seams of the expandable clay bentonite are also present.

SOURCE: Geoscience, 2016b

The Pressure Area is made up of distinct aquifers and aquitards that in some cases extend across several underlying geologic formations and collectively form the groundwater system within the subbasin. **Figure 4.4-2**, a north-to-south graphic representation of the hydrogeologic setting, shows the spatial relationships of the aquifers along the coast from Moss Landing to south of the CEMEX site. As shown, the Pressure Area consists of a series of aquifers at varying depths, which in some locations are separated by laterally extensive aquitards. The Pressure Area includes three prominent water supply aquifers and two, less notable, shallower aquifers. The primary aquifers, named for the average depth at which they occur, are the 180-Foot Aquifer, the 400-Foot Aquifer, and the deeper aquifers (Kennedy/Jenks, 2004; Geoscience, 2008). The primary aquifers and aquitards in the Pressure Area are described below and additional discussion is provided in the description of the Hydrogeologic Conceptual Model (HWG 2017 Appendix E-3, TM2, section 3.0).

Dune Sand Deposits and the Dune Sand Aquifer

Shallow groundwater is present in the Pressure Area and occurs in saturated sand dune deposits above low-permeability clay units such as the Salinas Valley Aquitard where present, or directly above the 180-Foot Aquifer or 180-FTE Aquifer. The shallow groundwater is in the coastal Dune Sand units or in scattered, thin, discontinuous sandy layers both at the coast and inland. Shallow groundwater is not expected to occur within much of the upper, younger Holocene-age[5] Dune Sand deposits, except in localized low-lying areas along the coastline. There is groundwater within the underlying Pleistocene-age[6] Older Dune Sand, which extends offshore beneath the ocean and up to 4 miles inland to the north-facing bluffs of the Salinas River where it resembles a transition between older deposits near the Monterey Landfill. The Older Dune Sand, referred to as the Dune Sand Aquifer, extends to depths up to 110 feet below the ground surface beneath the CEMEX site and is about 60 feet thick at the locations of the proposed slant wells. The shallow aquifer underlying the Moss Landing Area is referred to as the Perched[7] A Aquifer of the Salinas Valley, which is underlain by a defined layer of less permeable, fine-grained sediments known as the Salinas Valley Aquitard. The Perched A Aquifer appears to be hydraulically connected with a shallow aquifer local to the Monterey Peninsula Landfill area (referred to as the "-2- Foot" Aquifer) and the Dune Sand Aquifer near CEMEX area (HWG, 2017; see Appendix E3, TM2). The Dune Sand Aquifer is at a lower elevation and not hydraulically connected to the inland perched, mounded aquifers, namely the shallow, local 35-Foot Aquifer at the Monterey Peninsula Landfill and the "A" Aquifer in the Fort Ord Area (approximately 1.5 miles inland). The "A" Aquifer near Fort Ord is at a higher elevation than the Salinas Valley A-Aquifer and is perched on the Fort Ord-Salinas Valley Aquitard (FO-SVA).

Water quality of the Perched A Aquifer and Dune Sand Aquifer along the coast is directly influenced and controlled by seawater. Because of the aquifer's proximity to the ocean, most of the water in the Dune Sand Aquifer along the coast has been intruded by seawater and is considered saline to brackish (Kennedy/Jenks, 2004 and Appendix C3 Section 5.2).[8] The Dune Sand Aquifer has not in the past nor does it currently represent a source of potable supply because of its overall limited extent. The effects of seawater intrusion decrease inland where the infiltration of precipitation and applied agricultural water has more of an influence on groundwater quality. **Figure 4.4-3** presents a west to east geologic cross section that illustrates the relationship of the aquifers and geologic units from the CEMEX area to east of Highway 1 and Del Monte Boulevard. The upper portions of the proposed slant wells at the CEMEX site would have well screens installed across them and would draw water from these deposits.

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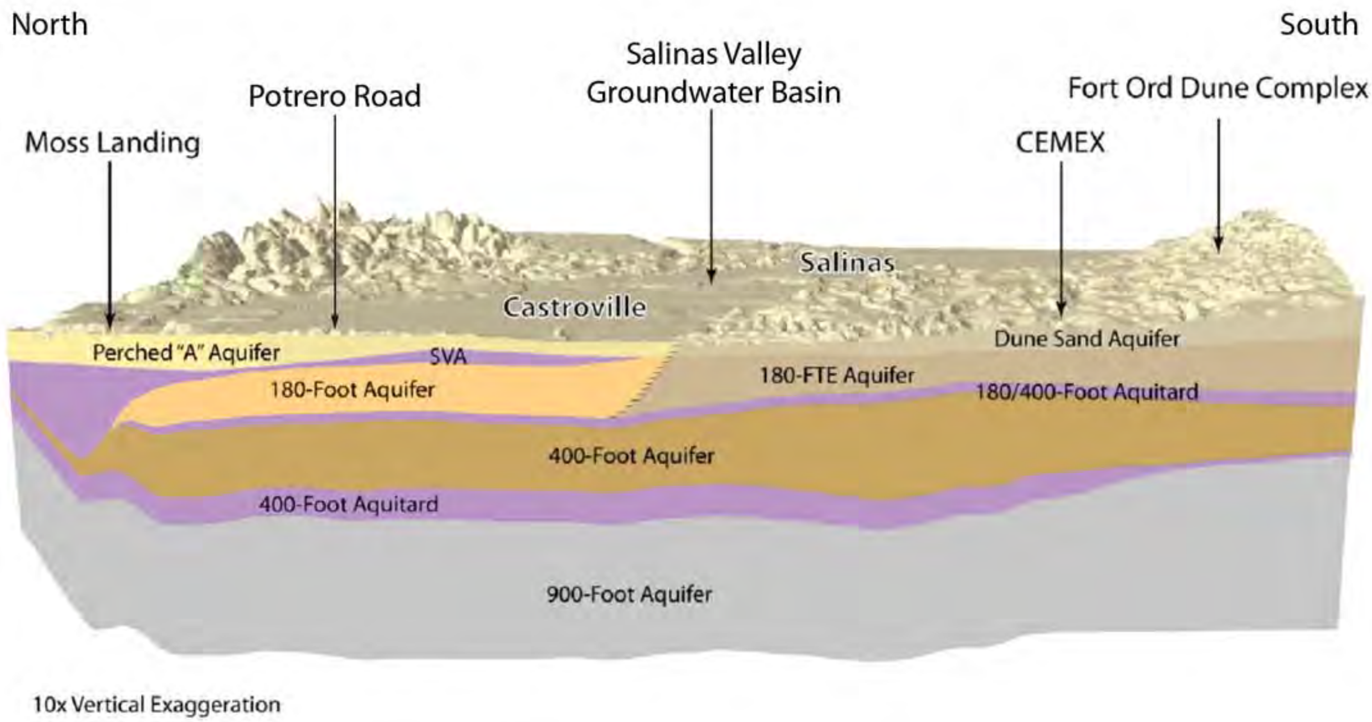
5 Holocene time is from the present to 11,000 years ago.
6 Pleistocene time was from 11,000 to 1.6 million years ago.
7 A perched aquifer contains unconfined groundwater in a zone above the main aquifer, separated by an unsaturated zone.
8 Saline water is water that has the approximate salinity of seawater, while brackish water is more saline than fresh water, but not as saline as seawater.



SOURCE: Adapted from HydroMetric, 2009a

205335.01 Monterey Peninsula Water Supply Project

Figure 4.4-2
Conceptual Model of Coastal Aquifers

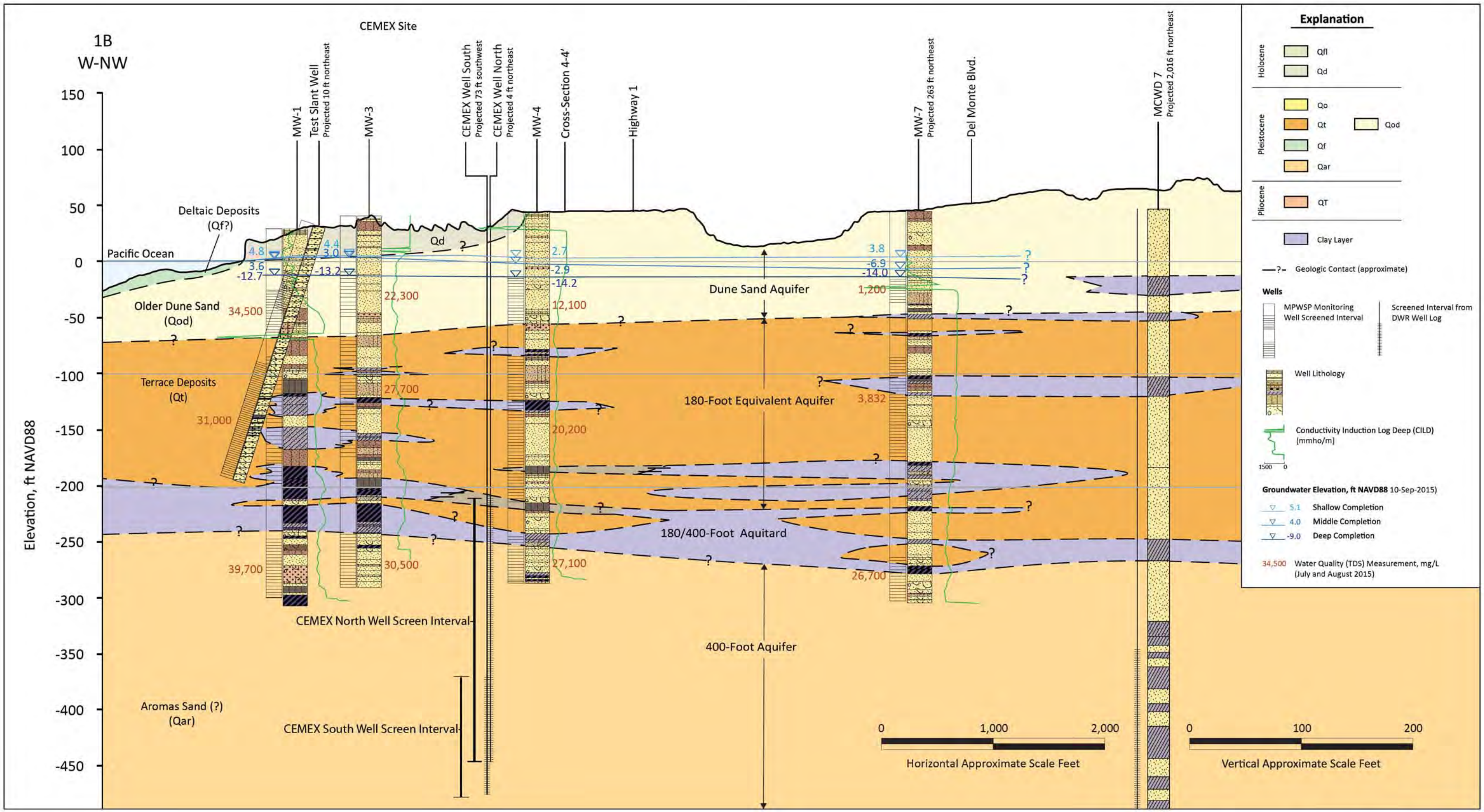
Salinas Valley Aquitard

The Salinas Valley Aquitard is a blue or yellow sandy clay formation up to 100 to 150 feet thick that lies mostly north of and generally parallel to the northwest-flowing Salinas River (MCWRA, 2006; Kennedy/Jenks, 2004; Durbin et al., 1978; Geoscience, 2013a). **Figure 4.4-4** shows the extent and thickness of the Salinas Valley Aquitard updated with information provided through the subsurface exploratory program completed at the proposed slant wells site on the CEMEX mining property. The Salinas Valley Aquitard thins and becomes discontinuous away from the centerline of the unit at the Pacific Ocean and was not observed in the exploratory borings at the CEMEX site. Consequently, the Dune Sand Aquifer deposits lie directly on top of Terrace Deposits and are thought to be hydraulically connected to the underlying aquifer. Elsewhere, the Salinas Valley Aquitard, where present, overlies the 180-Foot Aquifer, creating confined to semi-confined conditions for the underlying aquifers.

180-Foot Aquifer and 180-FTE Aquifer

The location of the 180-Foot Aquifer within the Salinas Valley is variable and extends across more than one stratigraphic or geologic unit. Various interpretations have correlated the aquifer to different combinations of stratigraphic units depending on the investigator, the area under study, and the investigator's interpretation. Consistent with the hydrogeologic understanding developed to support the impact analysis in this EIR/EIS, the 180-Foot Aquifer has been correlated with the lower portions of the Young and Older Dune Sand (Quaternary Alluvium) and the upper portions of the Aromas Sand (DWR, 2004a; Geoscience, 2008, 2013a). The lenticular (lens-shaped) sand and gravel bodies that make up the 180-Foot Aquifer indicate that they were originally deposited in a river, where the more laterally extensive units represent river channels that migrated and shifted over time (Kennedy/Jenks, 2004). The 180-Foot Aquifer has been geophysically mapped into the Monterey Bay where the unit is open to the ocean for several miles offshore (Greene, 1970; Eittreim et al., 2000).

As mentioned above, the Dune Sand Aquifer lies directly on top of the Terrace Deposits in the area along the coast with no confining layer to separate them. Based on the investigative work to correlate the hydrogeologic units of the Pressure Area, these Terrace Deposits along the coast appear to be at the same depth and have similar geologic characteristics as the inland Quaternary Alluvium of the 180-Foot Aquifer in the Salinas Valley (see **Figure 4.4-3**). Even though the Terrace Deposits are older than and lithologically different from the inland deposits of the 180-Foot Aquifer, the units are at the same depth interval and groundwater likely flows from one unit to the next. **Figure 4.4-2** identifies a "180-FTE Aquifer," which is shorthand for the 180-Foot Equivalent Aquifer; this chapter refers to it by its shorthand form. This unit is composed of terrace deposits that underwent a different depositional process than the inland 180-Foot Aquifer. However, the unit is at the same depth interval and is considered to be connected and equivalent to the 180-Foot Aquifer. Therefore, considering the level to which these units correlate, and to maintain consistency with the nomenclature used in this region, the aquifer interval is referred to as the 180-FTE Aquifer. At the CEMEX site, the Dune Sand Aquifer is unconfined and the 180-FTE Aquifer is semi-confined.



SOURCE: Geoscience, 2016

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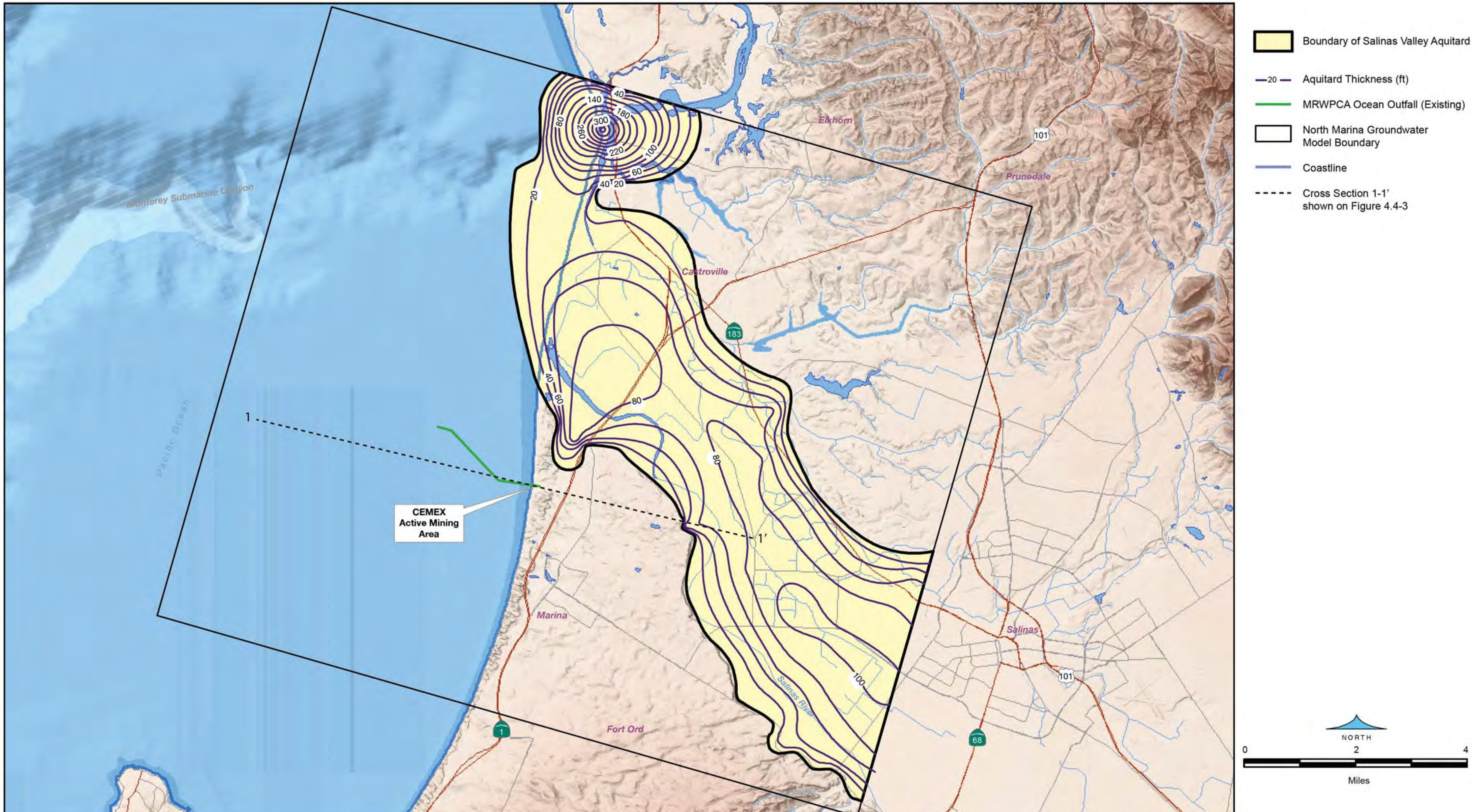
Figure 4.4-3
Project Area Hydrogeologic Cross Section



SOURCE: Geoscience, 2015c

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Figure 4.4-4
Thickness of Salinas Valley Aquitard

The Terrace Deposits of the 180-FTE Aquifer are composed of former alluvial fan and river floodplain deposits, possibly with some marine terrace deposits that contain sand, silt, and gravel now buried under the coastal dunes. There is groundwater within the Terrace Deposits, which extend to 240 to 255 feet below the ground surface beneath the CEMEX site, and are about 135 feet thick at the proposed slant well locations, thinning seaward. Based on the recent groundwater testing data discussed in the Groundwater Quality subsection below, the quality of water in the 180-FTE Aquifer is directly influenced by seawater; influence of this can be observed for miles inland, as discussed below in the Seawater Intrusion section. The lower portion of the proposed slant wells at the CEMEX site would have well screens installed across and would draw water from these deposits.

180/400-Foot Aquitard

As shown on **Figures 4.4-2** and **4.4-3**, the 180- and 400-Foot Aquifers are separated by the 180/400-Foot Aquitard (Kennedy/Jenks, 2004). The unit is generally 50 to 100 feet thick but can be as much as 200 to 250 feet thick and absent in some areas. This aquitard is present beneath the CEMEX site at about 220 feet below the ground surface or about 200 feet below mean sea level,) and is 10 to 70 feet thick. The slant wells at the CEMEX site would not penetrate the 180/400-Foot Aquitard.

400-Foot Aquifer

The underlying 400-Foot Aquifer correlates with the Aromas Sand and the upper Paso Robles Formation (Geoscience, 2008; Yates et al., 2005). At the CEMEX site, the 400-Foot Aquifer is within the Pleistocene Aromas Sand. The unconfined Aromas Sand consists of both older fluvial deposits and younger windblown, or eolian, deposits. The eolian portion of the Aromas Sand crops out just east of the central and southern portion of the project area and extends beneath the project area to offshore on the continental shelf and in the Monterey submarine canyon (CGS, 2002). The unit is up to about 500 feet thick in the northern area and due to its structure and orientation, ranges in depth from a few feet near the surface to several hundred feet below the ground surface (HydroMetrics, 2009a). The slant wells at the CEMEX site would not penetrate through the Aromas Sand or deeper geologic units. Based on the recent groundwater testing data, discussed in the Groundwater Quality subsection below, the 400-Foot Aquifer at the coast is directly intruded by seawater and water quality monitoring provides evidence that the influence extends for miles inland, as discussed below in the Seawater Intrusion subsection.

Deeper Aquifers

The deeper aquifer units in the SVGB have been referred to as the “Deep Zone,” “900-Foot Aquifer,” and “1,500-Foot Aquifer.” However, these are vague definitions because the water-bearing sediments are not necessarily at specific depths. For the purpose of this EIR/EIS, and to be consistent with current findings regarding the distribution of water-bearing zones below the 400-Foot Aquifer, the term “deeper aquifers” is used to describe these units.

The deeper aquifers of the SVGB correlate with the lower Paso Robles Formation, the Purisima Formation, and the Santa Margarita Sandstone (Yates et al., 2005) and are separated from the overlying 400-Foot Aquifer by a low-permeability blue marine clay (DWR, 2004a; Geoscience, 2008). In the MPWSP area, the deeper aquifers extend to an approximate maximum depth at the contact with the underlying Monterey Formation of -2,300 feet below mean sea level (bmsl) (Feeney and Rosenberg, 2003). Based on previous groundwater investigations, the deeper aquifers are made up of two separate units, which are hydraulically isolated from each other at the coast. The uppermost unit is in the Paso Robles Formation and the lower unit is associated with the Purisima Formation (Feeney and Rosenberg, 2003, MCWRA, 2017). In the area surrounding the CEMEX site within the NMGWM^{2016} model boundary, the deeper aquifers are within the Paso Robles and Purisima Formations. The Monterey Formation underlies the Purisima Formation and is considered the minimally water-bearing, lower boundary of the deeper aquifers. Water levels in the deeper aquifer are well below sea level, but groundwater degradation due to seawater intrusion is not occurring because the deeper aquifers are not connected to the Monterey Bay. Recharge to the Paso Robles and Purisima Formations is limited and is primarily supplied by leakage from overlying, and in some cases, underlying aquifers.

Increasing seawater intrusion over the past 30 years forced groundwater users in the Marina/Castroville area to drill and develop wells below the 400-Foot Aquifer. The proximity of the Marina Coast Water District (MCWD) wells to the encroaching seawater intrusion required it to be one of the first water districts to look to the deeper aquifers for a fresh water source (Feeney and Rosenberg, 2003). The first production well in the deeper aquifers was installed in 1974. Groundwater users in the Castroville area also had to drill into the deeper aquifers to find a fresh groundwater supply, but after implementation of the CSIP in 1998, many of the groundwater users in the Castroville area began receiving recycled water and ceased using their deeper aquifer wells. There are currently 32 production wells and 8 monitoring wells installed in the deeper aquifers in the Marina/Castroville area (MCWRA, 2017).

East Side Subbasin and Aquifers

The East Side Area is located inland to the east of the Pressure Area and encompasses about 125 square miles along the north side of the Salinas Valley from Gonzales to east of Castroville. The hydrologic boundaries of the East Side Area are generally the Pressure Area to the west, the Gabilan Range along the northeast, and a subarea referred to as the Forebay Subbasin to the south and southeast. With the exception of the relatively impermeable Gabilan Range, the precise locations of the boundaries fluctuate depending on seasonal variations, longer-term climate changes, and local groundwater pumping.

The hydrogeology and groundwater behavior is markedly different in the East Side Area than the Pressure Area due to the different depositional environments and geology (Kennedy/Jenks, 2004). The transition zone between the East Side Area and Pressure Area has been defined based on the transition from predominantly alluvial deposits within the East Side Subbasin to the fluvial deposits that make up the Pressure Area. The clay layers in the Pressure Area pinch out inland into the East Side Area. As noted above, the Salinas Valley Aquitard does not extend much into the East Side Area (Durbin et al., 1978). Water-bearing formations present within the East Side Area include Quaternary Alluvium (both alluvial fan and fluvial deposits), the Aromas Sand, the Paso Robles Formation, and the Purisima Formation (DWR, 2004b).

Seaside Groundwater Basin and Aquifers

The Seaside Groundwater Basin (SGB), as defined by the California Department of Water Resources, the Seaside Watermaster, and the Monterey Peninsula Water Management District, encompasses approximately 24 square miles at the southwest corner of the Salinas Valley adjacent to the Pacific Ocean (Yates et al., 2005). The Seaside Watermaster further subdivided the SGB into the Northern and Southern Subbasins by the Laguna Seca Anticline and a segment of the Ord Terrace Fault, which restrict groundwater flow between the subbasins (HydroMetrics, 2009a). The two subbasins are further subdivided into coastal and inland subareas with the division boundary just west of General Jim Moore Boulevard.

The SGB consists of three aquifers that correspond with the sedimentary units within the basin: the surficial Aromas Sand (**Table 4.4-1**) (which includes the Dune Sands), a shallow aquifer, and a deep aquifer (HydroMetrics, 2009a). The surficial Aromas Sand Aquifer is unsaturated in many places and, therefore, not directly used to produce potable groundwater as its proximity to the Pacific Ocean makes the water saline to brackish. In 2012, the Sand City desalinization plant produced 208.37 acre-feet (af) of potable water from this saline to brackish unit (CalAm, 2013).

The shallow aquifer is in the unconfined Paso Robles Formation, (**Table 4.4-1**) and generally corresponds with the 400-Foot Aquifer to the north in the SVGB (HydroMetrics, 2009a). The thickness of the unit ranges from about 250 feet just north of the Ord Terrace Fault to over 500 feet in the central and northern portions of the project area. The Aromas Sand, Paso Robles, and Purisima Formations are not present in the project area south of the Seaside Fault. The deep aquifer is in the underlying confined Santa Margarita Sandstone (see **Table 4.4-1**) and the Purisima Formation, and generally corresponds with the deeper aquifers in the SVGB. Groundwater resources in the SGB derive from the Paso Robles Formation and Santa Margarita Sandstone; the Santa Margarita Sandstone transitions with the Purisima Formation in the northern area of the SGB. The proposed ASR injection/extraction wells would be located in the Northern Subbasin (see Appendix H Figure 2-3 rev), close to the boundary with the SVGB, and would be screened in the Santa Margarita Sandstone. The late Miocene[9] to Pliocene Santa Margarita Sandstone has surface outcrops east of the project area (CGS, 2002) and is up to 400 feet thick in places (Durbin, 2007). The proposed ASR injection/extraction wells would be drilled to about 1,000 feet below the ground surface and would be screened within the Santa Margarita Sandstone (see Figure 4.2-2, and Appendix H Figures 2-33 and 2-34).

The northern hydrologic boundary of the SGB is a flow divide as groundwater to the north of the divide flows to the SVGB and groundwater to the south flows to the SGB (HydroMetrics, 2013). The northern SGB boundary is a dynamic hydrologic divide, the location of which depends on seasonal rainfall patterns, longer-term climate variations, and pumping rates in the SVGB and the SGB. The boundary passes through the former Fort Ord military base south of the city of Marina. The northern boundaries of the shallow and the deep aquifers in the SGB are at different locations, as discussed in the Groundwater Flow and Occurrence subsection below. The approximate flow divide between the SVGB and the SGB is based on groundwater elevation data derived from sampling conducted in the Paso Robles Formation and generally correlates with the

9 Miocene time was from 5.3 to 24 million years ago.

400-Foot Aquifer in the 180/400-Foot Aquifer Subbasin. The flow divide for the Santa Margarita Sandstone is different and appears to be located farther north due to pumping and aquifer characteristics within the Santa Margarita Sandstone and the Deep Aquifer. The basin boundary in the Dune Sands deposits is generally not defined because groundwater resources are typically not obtained from the Dune Sands within the Quaternary Alluvium, and because the Dune Sands are in direct hydraulic communication with the ocean and only saturated along the coastal margin (ICF Jones & Stokes, 2008). The other hydrologic boundaries of the SGB are the Sierra de Salinas/Santa Lucia Range to the south and east and the Pacific Ocean to the west.

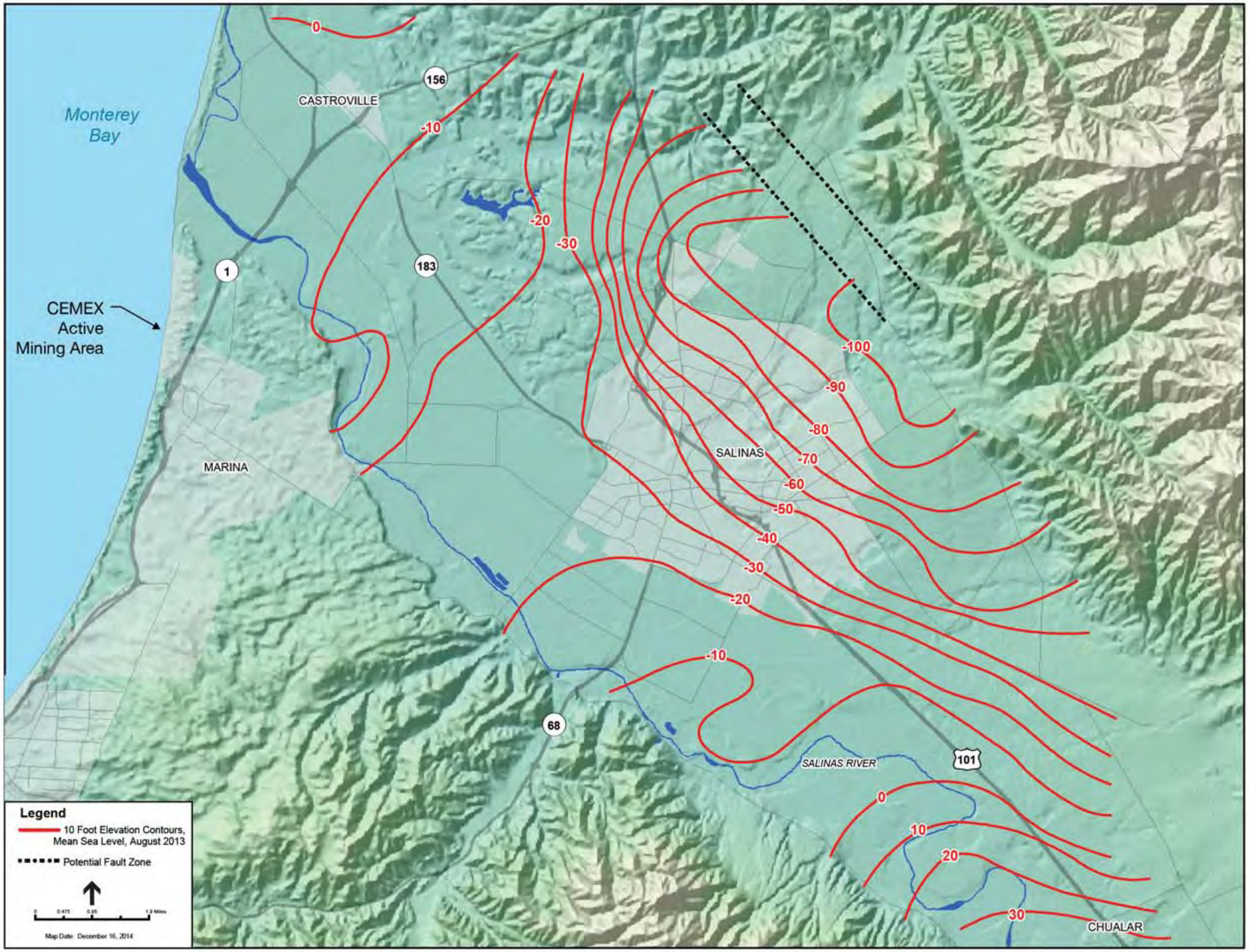
4.4.1.3 Groundwater Flow and Occurrence

A groundwater basin is much like a surface water reservoir because when water is removed from storage, the water level drops until the supply is replenished. The replenishment of the aquifer, referred to as recharge, occurs when water enters the aquifer either from the surface or from adjacent aquifers. Along the coast, the ocean can also recharge the aquifers and, in some areas, this causes the salty water from the ocean to mix with the fresh groundwater, causing seawater intrusion. This section summarizes groundwater elevations in the SVGB and SGB and describes groundwater flow patterns. The section also discusses how the groundwater inflow and outflow impact the balance – the amount of water entering a groundwater basin versus the amount of water leaving it – in the SVGB and SGB.

Groundwater Elevations and Flow Directions

Before extensive pumping began in the Salinas Valley, the regional groundwater flow was predominantly toward the coast from inland areas. Since the 1940s, hydrogeologic studies have shown a regional decline in the groundwater table, which has resulted in a sea-to-land groundwater gradient in some coastal areas. The MCWRA conducts a groundwater monitoring program throughout the Salinas Valley that for the fall 2013 monitoring event included 61 wells in the 180-Foot Aquifer and 103 wells in the 400-Foot Aquifer (Brown and Caldwell, 2015). Water-level data collected from wells in the study area indicate that the direction of groundwater flow is from the ocean to inland, as shown on **Figures 4.4-5** and **4.4-6**.

In the Pressure and East Side Areas, groundwater flows northwest from the upper reaches of the SVGB until it reaches the city of Salinas, at which point groundwater in both the 180-Foot and 400-Foot Aquifers flows towards a groundwater depression north of the city (MCWRA, 2014b). Along the coast, flow in both the 180-Foot and 400-Foot Aquifers is towards the east, or landward, and has resulted in seawater intrusion. At the proposed slant well locations, the Dune Sand and 180-FTE Aquifers along the coast are hydraulically connected to the Pacific Ocean, as verified by the saline chemistry of the groundwater samples collected from borings drilled along the coast. Groundwater flow directions in the Dune Sand Aquifer are complex due to the influence of the ocean and the Salinas River; however, Dune Sand Aquifer groundwater flow is indicated to be inland across the CEMEX site (Appendix E3, see TM2).



SOURCE: MCRWA, 2014a

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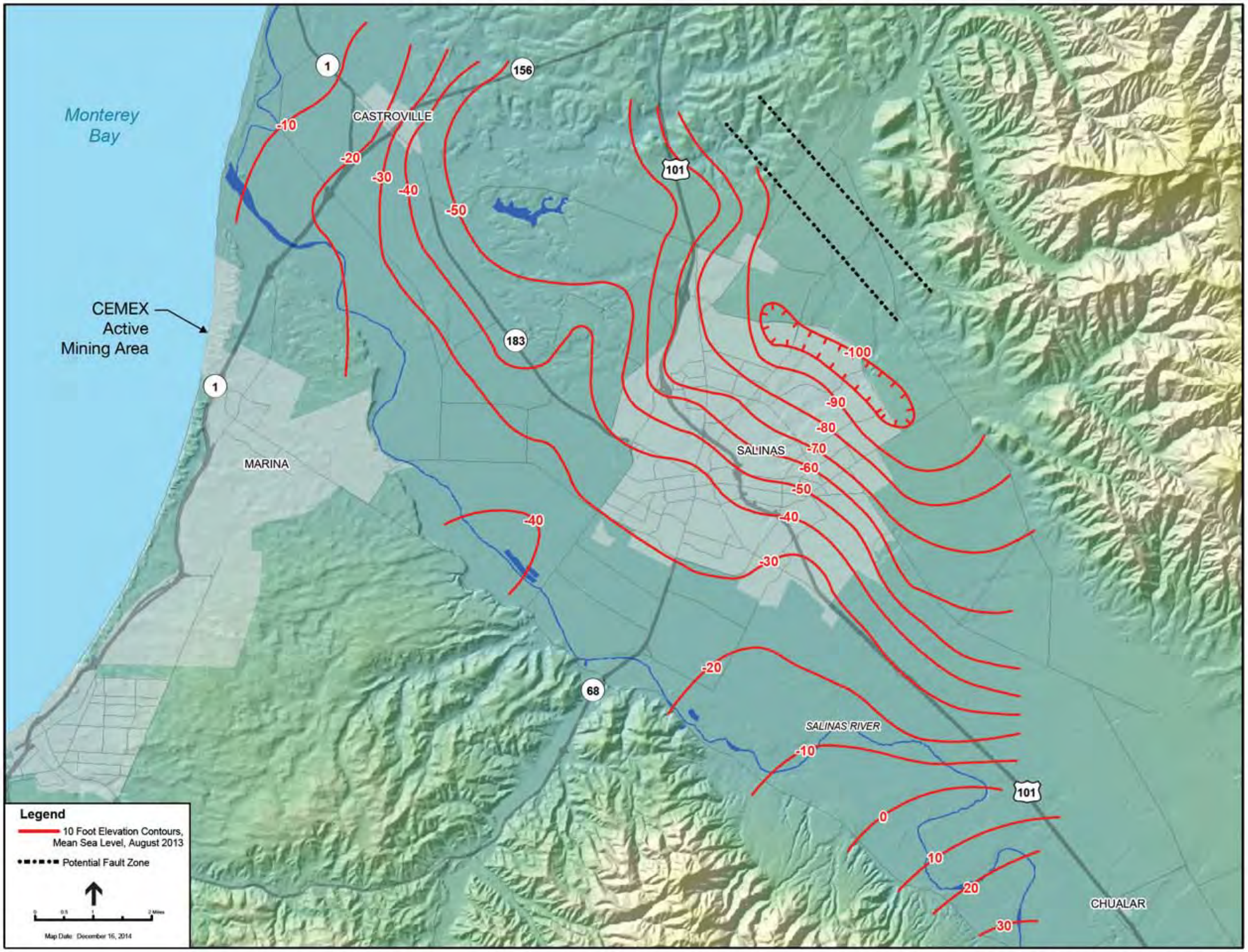
Figure 4.4-5
Salinas Valley Groundwater Basin - Groundwater Elevations in 180-Foot-Aquifer



SOURCE: MCRWA, 2014a

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Figure 4.4-6
Salinas Valley Groundwater Basin - Groundwater Elevations in 400-Foot-Aquifer

There is a groundwater divide along the north side of the SGB separating groundwater flow paths between the SGB and the SVGB in both the shallow and deep aquifers, as illustrated on **Figures 4.4-7** and **4.4-8**. The SGB has been divided into four subareas, with the northern two composing the Northern Subbasin and the southern two composing the Southern Subbasin. The proposed ASR injection/extraction wells would be located near the northern border of the Northern Subbasin. There is a groundwater depression in both the shallow and deep aquifers in the Northern Subbasin, resulting in some landward flow along the coast (HydroMetrics, 2015).

Basin Groundwater Balance

Groundwater balance is a term that describes the amount of water that enters the groundwater system versus the amount of water that leaves. Groundwater enters the system through recharge and can leave the system through groundwater pumping or natural discharge to surface streams or the ocean. Groundwater recharge occurs from the percolation of rainfall, infiltration from rivers and streams, underflow[10] originating in upper valley areas or as seawater intrusion, and agricultural irrigation and other return flow,[11] including enhanced groundwater recharge.[12] Whether an overlying formation can provide a pathway for recharge depends on numerous factors. For example, recharge from direct percolation depends on the absence of near-surface clay layers that can impede the downward flow of water, as is the case in areas where the Salinas Valley Aquitard restricts the downward migration of water (see **Figure 4.4-4**). Similarly, the amount of recharge from underflow depends on the hydrologic interconnections of the water-bearing formations, as well as any groundwater extraction occurring in upgradient areas within the basins. Historically, groundwater withdrawal within both the SVGB and the SGB has outpaced groundwater recharge of fresh water, resulting in overdraft[13] and seawater intrusion conditions (MCWRA, 2014a; Kennedy/Jenks, 2004; HydroMetrics, 2013).

Salinas Valley Groundwater Basin Balance

Inflows and Outflows

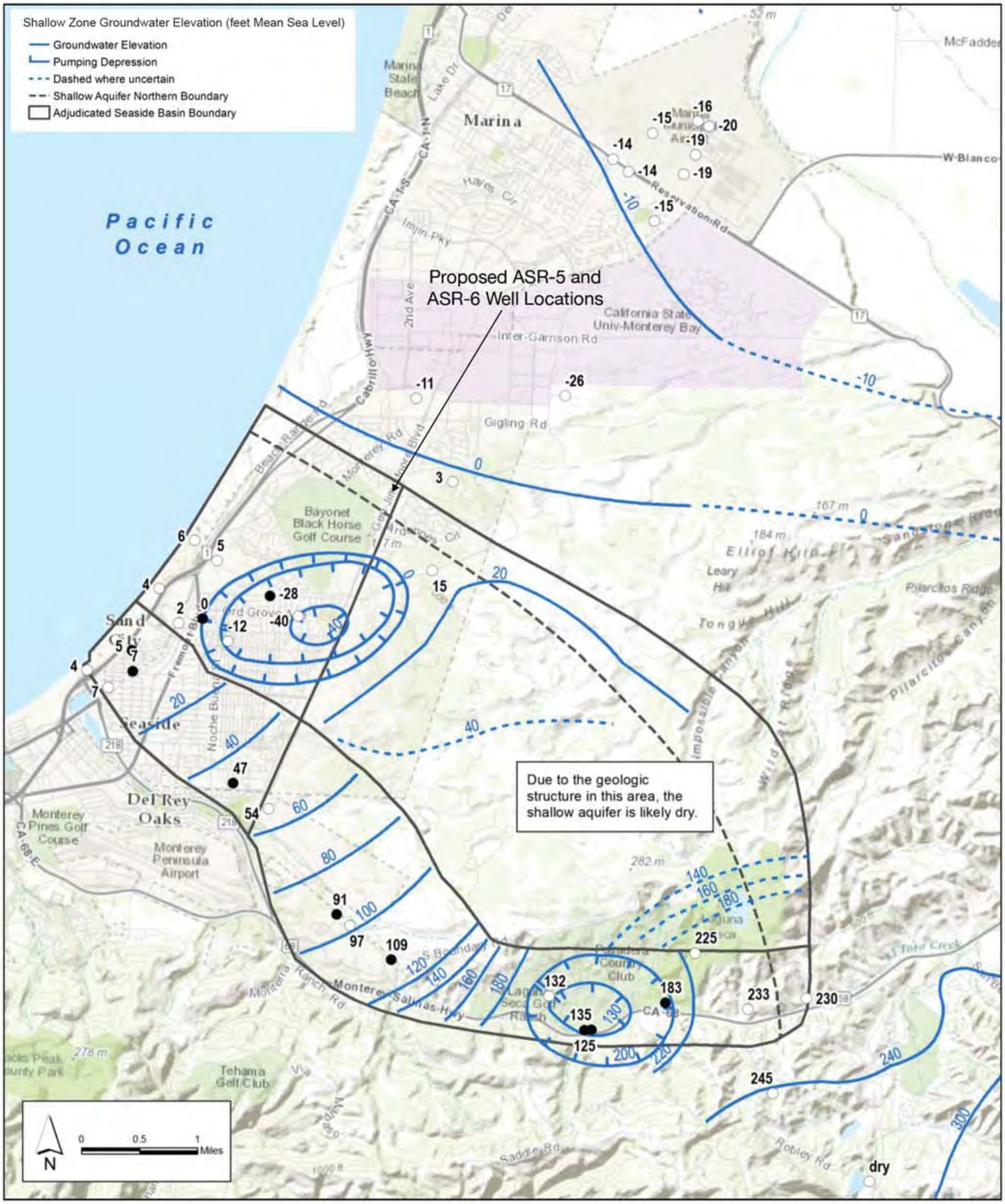
A quantitative accounting of the water balance within the SVGB was obtained from the recent study conducted for the Monterey County Resource Management Agency (MCRMA) (Brown and Caldwell, 2015). The study described the current state of the basin as well as the basin’s water balance, averaged over the period from 1958 to 1994. The study estimated the overall basin inflow at 504,000 acre-feet per year (afy), of which about 50 percent occurs as stream recharge, 44 percent as deep percolation from agricultural return flows and precipitation, and 6 percent as subsurface inflow from adjacent groundwater basins. Outflow from the basin was estimated at 555,000 afy, of which about 90 percent was identified as groundwater pumping and the remainder

[10] Underflow refers to groundwater that is flowing through the subsurface aquifers from higher elevation or higher pressure areas to recharge downgradient water bearing sediments.

[11] Return flow is irrigation water that is applied to an area and which is not consumed in evaporation or transpiration and returns to a surface stream or aquifer.

[12] Enhanced recharge refers to projects intended to accelerate localized recharge such as infiltration basins. The Castroville Seawater Intrusion Project (CSIP) is an example of a recharge project.

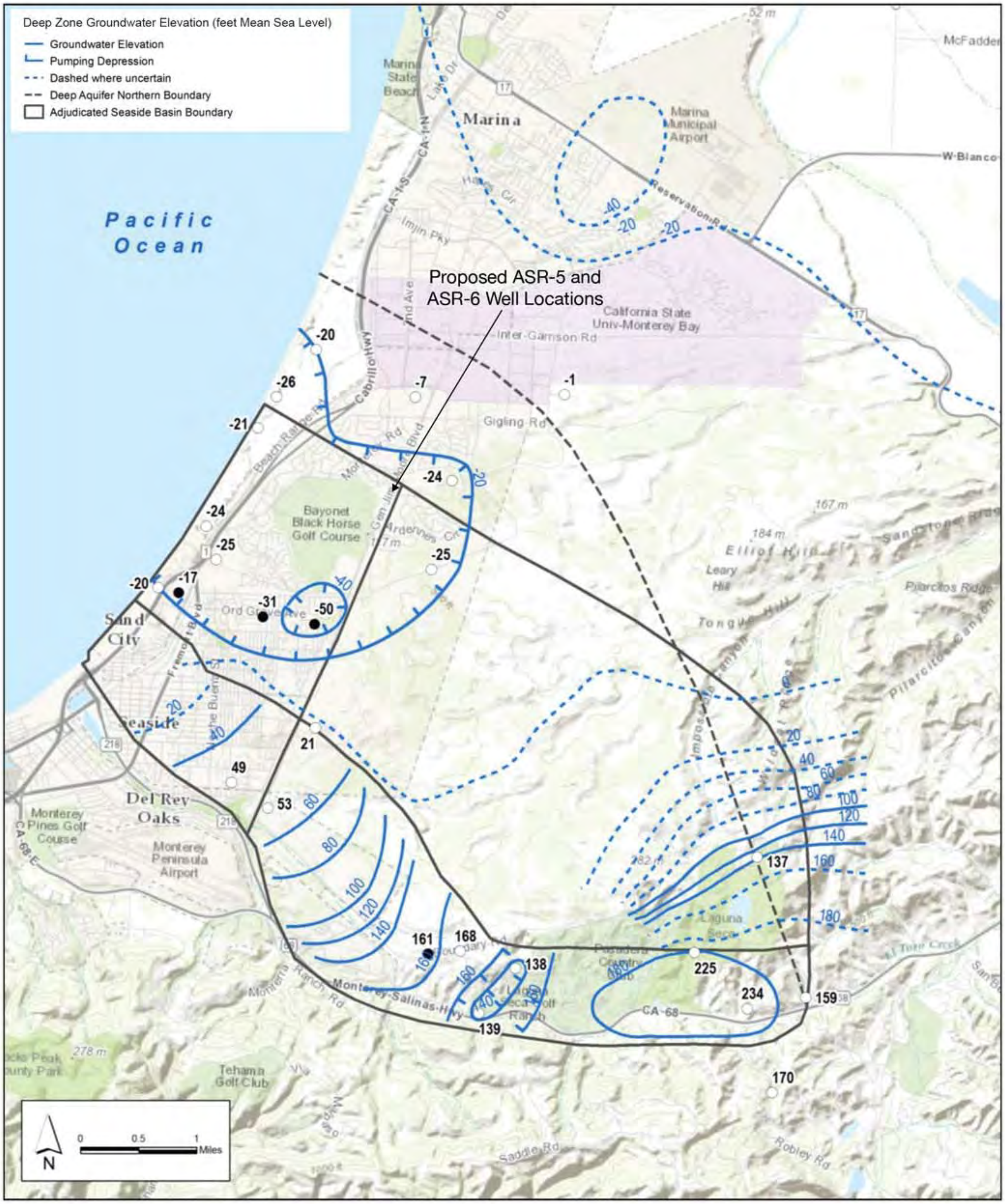
[13] Groundwater overdraft occurs when the groundwater levels are lowered due to excessive pumping at a rate that is greater than natural recharge.



SOURCE: HydroMetrics, 2015

Figure 4.4-7

Groundwater Flow – Seaside Basin Shallow Zone, July/August 2015



SOURCE: HydroMetrics, 2015

Figure 4.4-8
Groundwater Flow – Seaside Basin Deep Zone, July/August 2015

as evapotranspiration along riparian corridors.[14] The MCWRA estimated that in the lower basin portion of the Salinas Valley, recharge occurs by infiltration along the channel of the Salinas River (30 percent) and its tributaries (20 percent), irrigation return water (40 percent), and infiltration and precipitation over the valley floor, subsurface inflow, and seawater intrusion (10 percent) (MCWRA, 2006).

The estimated 555,000 afy of outflow subtracted from the estimated 504,000 afy of inflow results in basin overdraft. This imbalance is documented by seawater intrusion within the basin. Because of the current extent of seawater intrusion within the Pressure Area and the threat of additional seawater intrusion and other water quality deterioration in the SVGB, various programs have been designed to protect and restore the basin.

Groundwater Enhancement Programs in the SVGB

Numerous resource protection programs throughout the SVGB promote groundwater recharge. Specifically, the Salinas Valley Water Project (SVWP) has implemented, or has proposed to implement, various programs to stop seawater intrusion, to provide adequate water supplies to meet the current and future needs of the Salinas Valley, and to improve the hydrologic balance of the SVGB. These programs include modifications to the Nacimiento Spillway, the operation of Nacimiento and San Antonio Reservoirs, which are upstream on the Salinas River, and Salinas River recharge, conveyance, and diversion efforts. The two upstream reservoirs regulate stream flow to maximize recharge to groundwater. Lake San Antonio's capacity is 335,000 af and Lake Nacimiento's capacity is 377,900 af (MCWRA, 2007). Due to the extent of the confining layers that prevent surface infiltration within the subbasin, reservoir operators regulate flows in the Salinas River to maximize groundwater recharge before flows enter the 180/400-Foot Aquifer Subbasin boundary (RMC, 2006). The rate of recharge varies from year to year depending on the seasonal distribution of rainfall and the total annual precipitation. The operation of the reservoirs increases groundwater recharge by about 30,000 afy (RMC, 2003).

As part of the approved SVWP, changes in reservoir operations were implemented as SVWP Phase I and will continue to be made through Phase II of the SVWP to further enhance water conservation. An inflatable rubber dam diversion facility, operating on the Salinas River as part of the SVWP Phase I, captures excess river flows which are used to supplement the agricultural water supply by routing flows of 30 cubic feet per second to the Castroville Seawater Intrusion Project (CSIP). This rerouted water serves as an in-lieu groundwater supply in that it reduces agricultural pumping of groundwater. Phase II of the SVWP plans to increase the diversion at the rubber dam by 30,000 afy and to develop and implement other actions that would route 20,000 afy to the groundwater depression east of the city of Salinas.

[14] The MCWRA State of the Basin Study included the SGB within the Pressure Subarea (180-400 Foot Aquifer Subbasin).

The CSIP is a program operated in tandem with the Salinas Valley Reclamation Project (SVRP). The program has distributed recycled water through the Monterey Regional Water Pollution Control Agency (MRWPCA) service area since 1998 (MCWRA, 2006; MRWPCA, 2013). Tertiary-treated wastewater is obtained from the MRWPCA and delivered to agricultural users within the Pressure and East Side Subbasins of the SVGB, reducing groundwater extraction in those areas. This redistribution of water provides a form of in-lieu groundwater recharge by effectively reducing groundwater extraction in those areas of the basin within the CSIP delivery area. Over the past five years, the CSIP distribution system delivered between 11,400 and 15,470 afy of recycled water to farm lands in the CSIP delivery area (MRWPCA, 2017). The CSIP has a goal of increasing this volume to 22,000 afy in Phase II of the Program (MRWPCA, 2012).

Seaside Groundwater Basin Recharge

From 2003 to 2007, SGB recharge including both primary recharge components (percolation from rainfall and infiltration below stream beds) and secondary recharge components (irrigation return flows, leaks from water and sewer pipes, and septic system flows) averaged 3,570 afy (HydroMetrics, 2009a).

In addition to the basin's natural recharge, since 2006, the Monterey Peninsula Water Management District (MPWMD) has run an ASR program that actively enhances groundwater recharge **Figures 3-2** and **3-9** show the location of the existing and proposed ASR facilities, including the four existing ASR injection/extraction wells. Under the ASR program, Carmel River water is piped to the ASR wells on the former Fort Ord military base, where it is injected into the Santa Margarita Sandstone along the eastern side of the groundwater depression (shown on **Figure 4.4-8**), and is stored for later extraction and use, as needed. **Table 4.4-2** summarizes the injection volumes.

TABLE 4.4-2
SUMMARY OF ASR INJECTION VOLUMES (AF)

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
2	175	168	160	351	411	12	60	182	1,111	1,117	131	295	0	215

NOTE: All injection volumes in acre-feet

SOURCE: Pueblo Water Resources, 2014, 2016

Groundwater Extraction

Groundwater is an important water supply source for municipal and agricultural use in Monterey County. Groundwater extraction is monitored closely and reported on an annual basis for both groundwater basins addressed in this EIR/EIS. **Table 4.4-3** summarizes groundwater extraction within the northern SVGB and SGB from 2008 to 2014.

TABLE 4.4-3
GROUNDWATER EXTRACTION SUMMARY FOR THE SALINAS VALLEY AND SEASIDE GROUNDWATER BASINS (AF)

	2008	2009	2010	2011	2012	2013	2014
Salinas Valley Groundwater Basin							
180/400 Foot Aquifer Subbasin	130,139	121,165	103,544	105,172	113,898	117,242	120,890
Eastside Subarea	108,696	98,988	91,300	89,052	95,543	97,622	105,644
Seaside Groundwater Basin							
Coastal Subareas	4,242.1	3,332.0	3,679.9	3,298.4	2,962.8	2,983.52	3,120.51
Laguna Seca Subarea	1,029.9	1,060.6	867.7	853.1	870.1	912.27	919.64

NOTES: All values in acre-feet

SOURCES: MCWRA, 2009, 2015; SGB Watermaster, 2008 through 2014.

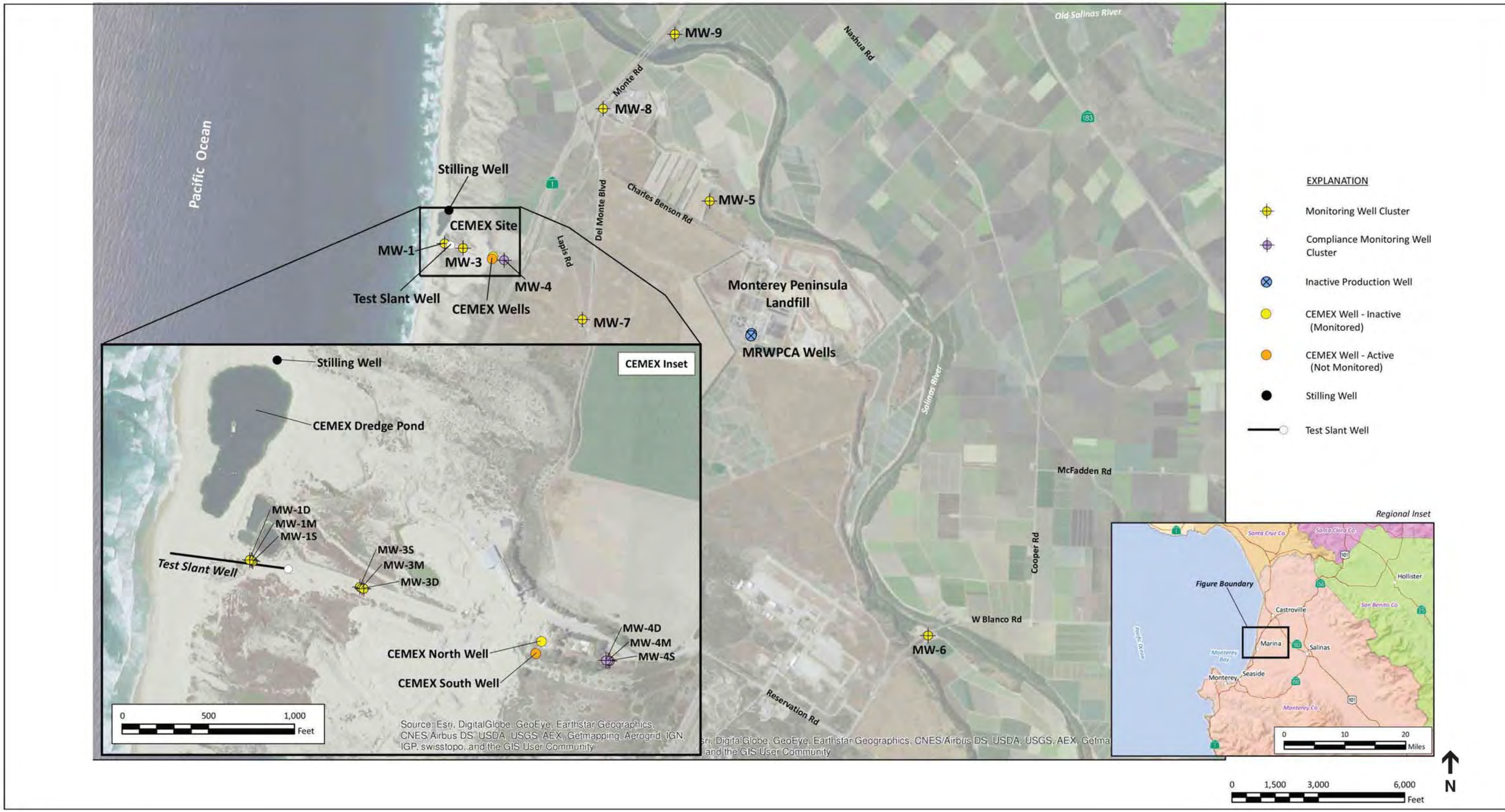
4.4.1.4 Groundwater Quality

Groundwater quality in the SVGB and SGB is influenced by natural geochemical properties and flow within the different hydrogeologic formations, groundwater pumping and induced seawater intrusion, land use practices, and accidental releases of contaminants into the environment. Additional water quality concerns for the SGB, and particularly the Santa Margarita Sandstone, include the presence of disinfection byproducts in the injected water and long-term changes in the geochemistry of the groundwater system. While this section of the EIR/EIS focuses on groundwater basin water quality, Section 4.7, Hazards and Hazardous Materials, provides additional information on areas with contaminated soil and shallow groundwater.

Groundwater Quality at the Proposed Slant Well Location

CalAm commissioned a subsurface soil and groundwater investigation to further understand the existing subsurface geologic units, aquifers, and water quality of the proposed slant well locations on the CEMEX site. The investigation included the installation of nested monitoring wells and the test slant well, subsurface lithologic logging, soil and groundwater sample analysis, aquifer testing, and aquifer conditions modeling (Geoscience, 2013c, 2016a, 2016b). **Figure 4.4-9** shows the locations of the nested monitoring wells. The nested wells have screen intervals to discretely sample the Dune Sand Aquifer, 180-FTE Aquifer, and the 400-Foot Aquifer depth intervals. The subsurface investigation provided information and data to better characterize the subsurface stratigraphy, aquifer conditions, how the aquifer responds to pumping, and groundwater chemistry at various depth intervals. Updated information on subsurface materials informed the design of the proposed slant wells, and data on groundwater flow characteristics and water chemistry facilitated further refinement of the groundwater models used to analyze project impacts. Refer to Appendix E3 for additional discussion.

The proposed slant wells would draw water from the Dune Sand Aquifer and the 180-FTE Aquifer from about 30 feet below msl to 200 feet below mean sea level (Geoscience, 2016b). As discussed above in Section 4.4.1.2, the Dune Sand Aquifer overlies the 180-FTE Aquifer with no aquitard/between the units. The test slant well is screened across both units and has been sampled



SOURCE: GeoScience, 2016

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Figure 4.4-9
Slant Well and Monitoring Well Locations

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on a weekly basis when operational. **Table 4.4-4** summarizes water quality results from the May 19, 2016, sampling event. The table also provides the chemical composition of seawater; as the comparison shows, the water quality from the test slant well closely resembles the average seawater TDS concentration found along the central coast of California.

**TABLE 4.4-4
GROUNDWATER QUALITY OF TEST SLANT WELL**

Chemical Parameter	Units	Test Slant Well	Central Coast Seawater Average
Bicarbonate as HCO_3^-	mg/L	139	103
Boron	mg/L	3.54	4.35
Bromide	mg/L	59.4	64.5
Calcium	mg/L	542	395
Chloride	mg/L	16,965	18,537
Iron	µg/L	ND	0.003
Magnesium	mg/L	1,180	1,230
Nitrate as NO_3	mg/L	3	0.67
pH (field)	pH units	7.07	7.5-8.5
Potassium	mg/L	287	382
Salinity	psu	29.4	33.69
Sodium	mg/L	9,357	10,329
Sulfate as SO_4	mg/L	2,353	2,598
Total Dissolved Solids (Lab)	mg/L	31,900	33,694

NOTES:
mg/l = milligrams per liter; µg/L = micrograms per liter
psu = practical salinity units; µmhos /cm = micromhos per centimeter

SOURCE: Geoscience, 2016a; Hem, 1989

Groundwater Quality in the Santa Margarita Sandstone and the Seaside Groundwater Basin

Santa Margarita Sandstone overlies the Monterey Formation, and sections of the unit are present beneath the project area near Seaside at depths of about 800 feet. The proposed project would install two additional ASR wells (ASR-5 and ASR-6 Wells) in the Santa Margarita Sandstone in the northern subarea of the Seaside Basin to increase the injection, storage and extraction capacity.

In 2007, the MPWMD commissioned a study that evaluated the potential geochemical effects of injecting treated drinking water into the Santa Margarita Sandstone (EcoEngineers, 2008). The water quality data for the Santa Margarita Sandstone came from that study. The study estimated the nature and magnitudes of potential dissolution and precipitation reactions, the potential for scaling or biofouling, and the post-injection concentrations of chemicals in the water as compared with drinking water standards. The study used Carmel River water treated to drinking water standards from the CalAm Begonia Iron Removal Plant and combined the treated water with rock material and native groundwater from the Santa Margarita Sandstone. After an 18-hour exposure period, the water mixture (referred to in the study as leachate) was reanalyzed for water quality constituents and the concentrations were compared with California Primary and Secondary Maximum Contaminant Level (MCL) drinking water standards. **Table 4.4-5** summarizes the water chemistry of the initial treated water and the resulting leachates from two depth intervals. The results indicated that the leachate obtained from mixing treated water with the Santa Margarita Sandstone and its native water did not exceed drinking water standards and did not show significant differences in water quality.

Water Quality and the Existing ASR System

Pueblo Water Resources prepares annual Summary of Operations reports that document the ASR system's well performance and water quality. The ASR system discussions below draw on the water year 2015[15] monitoring activities unless otherwise cited (Pueblo Water Resources, 2016).

Annual injection operations have occurred at the ASR-1 Well since 2002, altering the groundwater quality in the local area from its pre-injection, naturally-occurring conditions. Consequently, making a clear distinction between native and non-native water quality is both complex and somewhat subjective. This change in native water quality, as confirmed by testing, was observed in distant wells such as Well PCA-E, which is located 6,200 feet west of the ASR injection/extraction wells. Well PCA-E is a monitoring well operated by the MPWMD and screened in the Santa Margarita Sandstone. For the 2015 water year, groundwater in Well PCA-E was estimated to contain about 30 percent injected potable water.

The ASR project has historically used the chloride ion to track the general mixing, dilution, and interaction between injected and native groundwater. Chloride is very stable and highly soluble and is present in both injected and native groundwater. Pueblo Water Resources continually monitors the response of the Santa Margarita Sandstone to the injection and extraction of treated water. The historical chloride concentration of the native groundwater within the Santa Margarita Sandstone has averaged approximately 120 to 130 mg/L in this area of the Seaside Basin. However, injecting treated water into the Santa Margarita Sandstone reduces chloride concentrations in the injection area. Chloride concentrations decreased to as low as 30 mg/l during the March 2015 sampling event, well below the average chloride concentration of 120 mg/L. As a result, repeated ASR injection, storage, and recovery cycles are expected to incrementally produce water that is similar in nature to the injected water, creating a buffer zone of mixed water that gradually increases over time.

Disinfection Byproducts

As part of the current ASR program, Carmel River water is treated by removing iron and manganese, disinfecting the water with sodium hypochlorite, and injecting the potable water into the Santa Margarita Sandstone (Pueblo Water Resources, 2014). The potable water undergoes a chlorination process to disinfect it of possible microbiological contamination prior to injection

[15] A water year is the 12-month period from October 1 of any given year through September 30 of the following year. The water year is designated by the calendar year in which it ends. That is, the water year that starts on October 1, 2014 and ends on September 30, 2015 is the 2015 water year.

TABLE 4.4-5
WATER CHEMISTRY RESULTS OF MIXING STUDY

Chemical Parameter	Treated Carmel River Water	Leachate 540-580 feet	Leachate 730-770 feet	California MCLs
Alkalinity as $CaCO_3$	129	130	128	NE
Aluminum	0.025	0.025	0.025	1 / 0.2 (Sec)
Ammonia Nitrogen	0.1	0.1	0.1	NE
Arsenic	ND (0.005)	ND (0.005)	ND (0.005)	0.010
Antimony	NR	ND (0.0005)	ND (0.0005)	0.006
Barium	0.056	0.039	0.043	1
Bromide	0.11	0.11	0.11	NE
Beryllium	NR	ND (0.0005)	ND (0.0005)	0.004
Cadmium	NR	ND (0.00025)	ND (0.00025)	0.005
Calcium	36	39	36	NE
Chloride	32	33	33	250 (Sec)
Dissolved Organic Carbon	1.4	1.6	3.4	NE
Chromium	NR	ND (0.0005)	ND (0.0005)	0.10
Cobalt	NR	ND (0.0005)	ND (0.0005)	NE
Dissolved Oxygen	7.43	nana	NA	NE
Electrical Conductivity	510	484	490	900 (Sec)
Fluoride	0.30	0.25	0.27	2
Iron	0.001	ND (0.02)	ND (0.02)	0.3 (Sec)
Lead	NR	ND (0.0005)	ND (0.0005)	0.015[a]
Magnesium	14	14	13	NE
Manganese	0.001	0.001	0.001	0.05 (Sec)
Mercury	NR	0.00017	0.00044	0.002
Molybdenum	NR	0.0031	0.0034	NE
Nickel	NR	0.0011	0.0014	0.10
Nitrate/Nitrite as NO_3	0.05	0.12	0.47	10
Oxygen Reduction Potential (ORP)	749	550	544	NE
pe (= ORP/59.16)	12.66	9.30	9.20	NE
Total Phosphorous	0.34	0.30	0.34	NE
Potassium	2.9	2.9	3.4	NE
pH	7.70	6.71	6.28	NE
Selenium	0.0017	0.0018	0.0021	0.05
Silicon	8.41	8.88	8.41	NE
Silver	NR	ND (0.0005)	ND (0.0005)	0.10[a]
Sodium	42	40	42	NE
Strontium	0.200	0.250	0.250	NE
Sulfate as SO_4	84.9	85.4	79.4	250 (Sec)
Thallium	NR	ND (0.0005)	ND (0.0005)	0.002
Uranium	0.0025	0.0025	0.0060	0.03
Vanadium	NR	0.00073	0.00086	0.05[a]
Zinc	0.210	0.034	0.84	0.5 (Sec)

NOTES:

MCLs = Primary Maximum Contaminant Levels also referred to as Primary Drinking Water Standards; Sec = Secondary MCLs
All concentrations in milligrams per liter (mg/L) except conductivity (micromhos per centimeter), ORP (millivolts), and pH (pH units)
NA = not analyzed ND = not detected above reporting limit NE = not established NR = not reported

[a] Lead has a regulatory action level, not an MCL

SOURCE: EcoEngineers, 2008.

into the Santa Margarita Sandstone. This chlorination process is known to produce disinfection byproducts (DBPs), including trihalomethanes (THMs)[16] and haloacetic acids (HAAs)[17] that have regulatory limits for drinking water purposes.

While it has been successfully demonstrated at the Seaside Basin ASR site, as well as at other ASR sites in California and elsewhere, that successive injection/storage/recovery cycles can yield fully potable water upon recovery, issues regarding the fate and stability of disinfection byproducts in the subsurface can also affect the potability of the recovered water. The monitoring results evaluated by Pueblo Water Resources indicate that the THMs do increase upon initial injection of treated surface water into the Santa Margarita Sandstone, but that concentrations steadily decrease with time. Groundwater monitoring results indicate that, over the course of that time, the pH has remained neutral (between 6 and 8), indicating relatively stable geochemical conditions. The DBP data collected during the 2015 water year indicated that THMs peaked approximately 30 to 90 days after injection and storage, followed by a gradual decline. After approximately 150 to 210 days of storage, THMs in four out of the five wells monitored had degraded to below the initial injection levels. Although the concentration of THMs in the ASR-3 well had not yet reached the initial injection level as of 210 days, the concentration was exhibiting a continuing downward trend, suggesting the initial injection concentration would be reached within about 240 days[18]. HAAs degraded to below reporting limits by 90 to 100 days. More importantly, throughout the 2015 water year, after the initial increase following injection, THMs were below the MCL of 80 micrograms per liter and HAAs were below the MCL of 60 micrograms per liter in all five wells monitored (Pueblo Water Resources, 2016).

During the testing of the ASR project described above, studies found that levels of hydrogen sulfide in the recovered water were much lower than the concentrations in natural groundwater prior to injection, indicating a lasting and significant improvement of water quality during subsurface water storage.[19] This suggests that conditioning the aquifer may be an ancillary benefit of the ASR in the SGB. That is, ASR may reduce hydrogen sulfide in the extracted groundwater, which would then reduce the amount of chemical treatment that needs to be performed at the Santa Margarita Chemical Building. According to a report that summarized the

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[16] THMs are a group of four chemicals that are formed along with other disinfection byproducts when chlorine or other disinfectants used to control microbial contaminants in drinking water react with naturally occurring organic and inorganic matter in water. The THMs are chloroform, bromodichloromethane, dibromochloromethane, and bromoform. The USEPA has published the Stage 1 Disinfectants/Disinfection Byproducts Rule to regulate total THMs at a maximum allowable annual average level of 80 parts per billion (USEPA, 2012).

[17] HAAs are a group of chemicals that are formed along with other disinfection byproducts when chlorine or other disinfectants used to control microbial contaminants in drinking water react with naturally occurring organic and inorganic matter in water. The regulated HAAs are monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid. The USEPA has published the Stage 1 Disinfectants/Disinfection Byproducts Rule to regulate HAAs at 60 parts per billion annual average (USEPA, 2012).

[18] Pueblo Water Resources describes the rates and trends as “approximate” and “typical” because the actual rates and trends for an individual well during any one of the monitoring events vary and may be slightly outside of the typical trends observed since the evaluations began in 2001. Considering that the concentrations are below MCLs and the trends are always downward back to the initial injection levels, this one outlier is not considered to be significant.

[19] The hydrogen sulfide reduction is likely due to the effects of the injected chlorine residual and dissolved oxygen content. These oxidizers react in the subsurface to stifle anaerobic bioactivity, which normally produces hydrogen sulfide. As the aquifer environment is altered and becomes inhospitable to anaerobes, hydrogen sulfide generation declines. This effect has also been observed in ASR wells in similar coastal aquifers in Santa Barbara, Alameda, and Ventura Counties.

pilot study results for the ASR project, the ozone treatment plant may become unnecessary with continued ASR operations over time (Padre Associates, 2004).

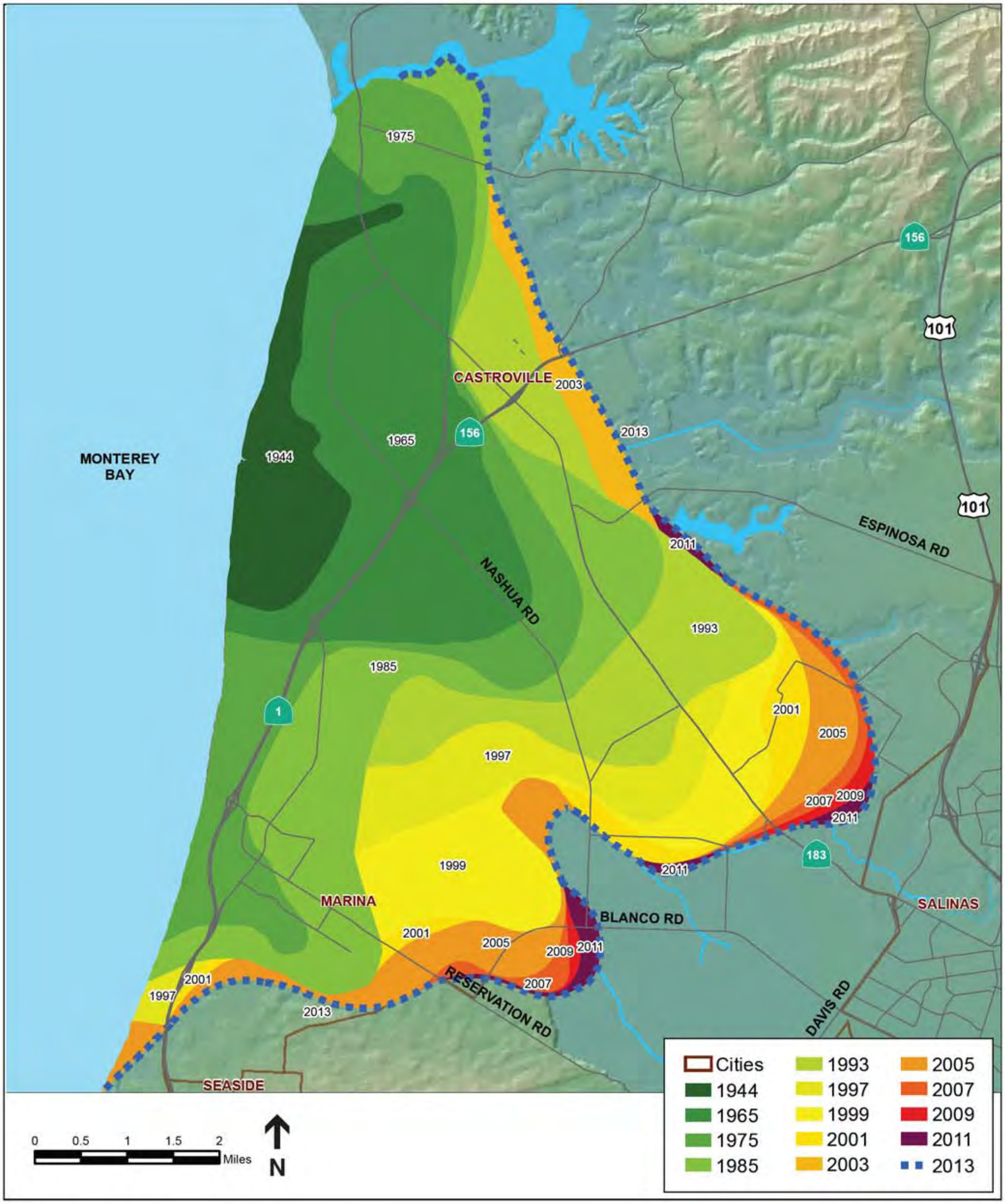
Seawater Intrusion

Seawater intrusion occurs when ocean water enters fresh groundwater aquifers at the coast and migrates inland. The salty seawater combines with the fresh groundwater to create a mixture referred to as brackish water. The current, standard practice for monitoring the inland advance of seawater intrusion involves TDS and/or chloride analysis of groundwater from a select group of monitoring wells that intersect the seawater-intruded aquifers. The concentration data are used to identify the areas of the aquifer intruded by seawater and to plot the leading edge of the inland seawater intrusion front. The more groundwater wells available in the monitoring program, the better regional seawater intrusion is represented. Regular annual monitoring data can be used to estimate the rate at which seawater is migrating inland. The MCWRA has been conducting seawater intrusion monitoring in the 180-Foot and 400 Foot Aquifers for many years using several groundwater wells in the western end of the Salinas Valley. **Figures 4.4-10** and **4.4-11** illustrate the seawater intrusion areas as of 2015 within the 180-Foot and 400-Foot Aquifers, respectively, based on the concentrations of chloride in wells sampled by the MCWRA (MCWRA, 2015); the extent of seawater intrusion based on the concentrations of TDS or chloride would be very similar, if not identical. Brackish groundwater can contain TDS concentrations ranging from that of seawater (about 33,500 mg/L) down to 500 mg/L near the leading (inland) edge of the inland seawater intrusion front (chloride concentrations would range from 19,000 mg/L down to 500 mg/L).[20] The MCWRA defines the leading edge of inland seawater intrusion as groundwater containing chloride at 500 mg/L or more. The California Secondary Drinking Water Standard was amended in 2006 to include a Maximum Recommended Level for TDS in drinking water of 500 mg/L and chloride at 250 mg/L (Cal. Code Regs., Title 22, § 64449).

Salinas Valley Groundwater Basin

The SVGB is hydrologically connected to Monterey Bay by ocean outcrops of the 180-Foot and 400-Foot Aquifers a few miles offshore (Eittreim, et. al., 2000; Greene, 1970). The ocean outcrops provide a constant source both of pressure and of direct recharge of seawater and facilitate the recharge of seawater into those aquifers along the coast when groundwater extraction exceeds natural recharge. As a result, a landward groundwater gradient has developed along the coast and induced groundwater recharge from the ocean since the mid-20th century. Seawater intrusion in the SVGB was first documented in 1946 (DWR, 1946). The overdraft condition has degraded groundwater quality along the coast within the SVGB. Before wells extracted water from the Salinas Valley, there was a balance between the seawater in the ocean and the groundwater in the inland aquifers. Surface water within the watershed would infiltrate

[20] For the purposes of the EIR/EIS: seawater is defined as water that originated in the ocean, identified as containing 33,500 mg/L TDS, which represents current salinity levels in Monterey Bay; brackish water is a combination of seawater and fresh water with TDS concentrations between 500 mg/L and 33,500 mg/L; and fresh water is that which originated in a groundwater basin through precipitation or rivers and streams and contains TDS concentrations of less than 500 mg/L.



SOURCE: MCWRA, 2015b

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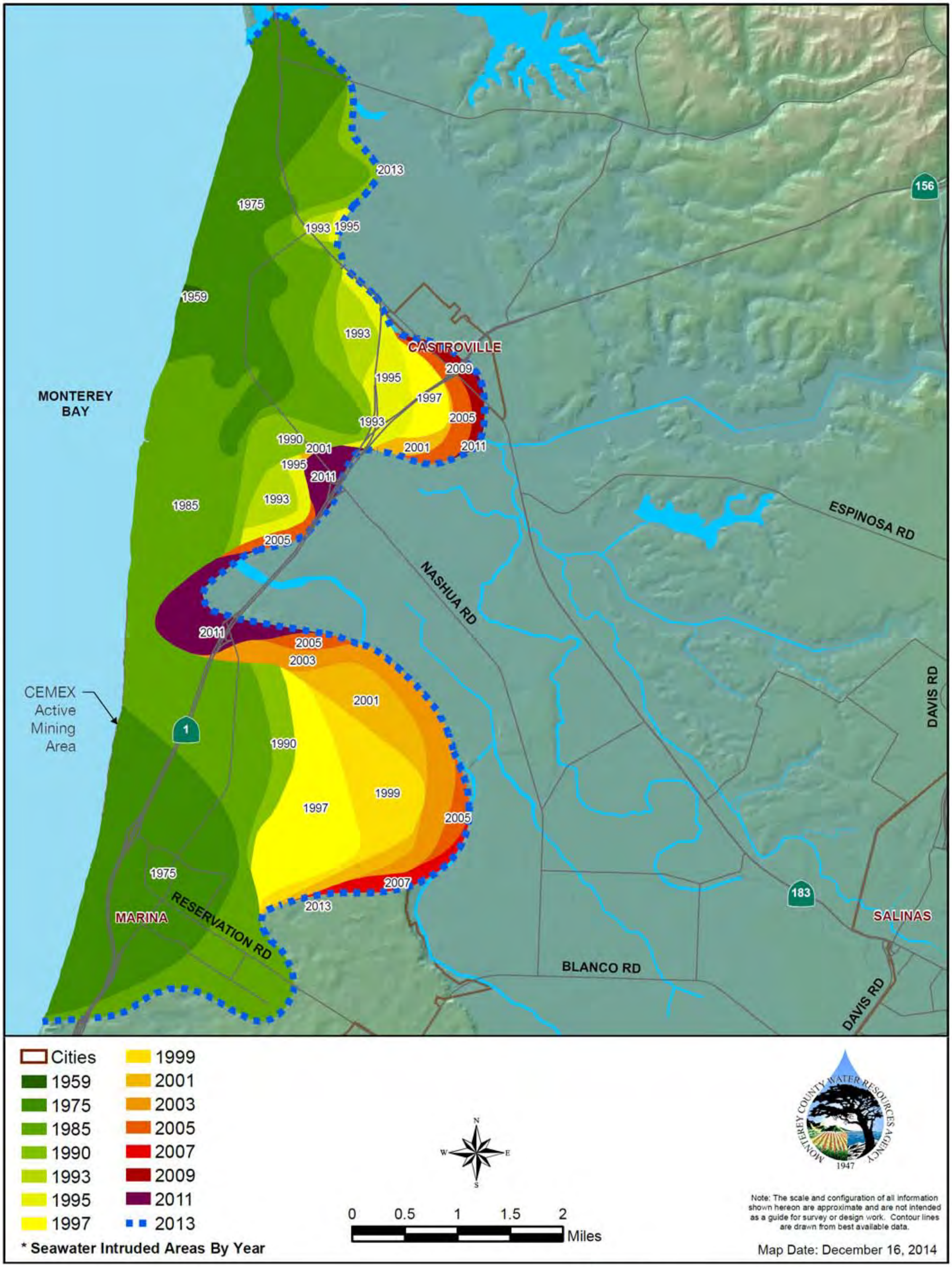
Figure 4.4-10
Historic Seawater Intrusion in the
Salinas Valley Groundwater Basin - 180-Foot Aquifer



Monterey Peninsula Water Supply Project . 205335.01

SOURCE: MCWRA, 2014b

Figure 4.4-11
Historic Seawater Intrusion in the Salinas Valley Groundwater Basin - 400-Foot Aquifer

down into the aquifer, but it would be at a higher elevation than the surface of the ocean. Gravity requires that the difference in elevation forces the fresh water in the inland areas to migrate down and press back against the seawater. With the development of the Salinas Valley, water supply wells were installed and groundwater was extracted from the aquifer. This action reduced the weight of water on the inland side of the seawater intrusion front, creating a pressure imbalance, and resulted in the landward migration of the intrusion front to its current location.

The 2015 estimates of seawater intrusion within the 180-Foot and 400-Foot Aquifers indicate that seawater has intruded to a maximum of approximately 8 miles and 3.5 miles inland, respectively, as inferred from chloride concentrations greater than 500 mg/L. The seawater intrusion degraded groundwater supplies, requiring urban and agricultural supply wells within the affected area to be abandoned or destroyed (MCWRA, 2001). Increased degradation of coastal groundwater aquifers led to restrictions on drilling groundwater wells and extracting groundwater from areas affected by seawater intrusion, as discussed in Section 4.4.2, Regulatory Framework. Such restrictions are intended to reduce further inland migration of seawater and reduce the landward advance of the seawater intrusion front.

CEMEX Area

The degree of seawater intrusion varies depending on the distance from the coast and the depth of the aquifer. As discussed in detail in Section 4.4.4 below, and **Appendix E3**, CalAm installed several monitoring well clusters for the MPWSP to investigate groundwater flow and quality in the Dune Sand Aquifer, the 180-FTE aquifer and the 400-Foot Aquifer at and inland of the CEMEX site. CalAm well clusters MW-1, MW-3, MW-4, located at CEMEX, as shown on **Figure 4.4-9**, were tested in 2015 and contained TDS concentrations ranging from 11,900 mg/L to 32,600 mg/L with chloride ranging from 5,497 mg/L to 16,069 mg/L. CalAm monitoring well clusters farther afield of the CEMEX site (MW-7, MW-8, and MW-9) contained TDS concentrations ranging from 29,000 mg/L (MW-9M) to 366 mg/L (MW-9D) with chloride ranging between 16,519 mg/L to 74 mg/L in the same wells.[21] Monitoring well clusters MW-5 and MW-6, located the farthest distance from the CEMEX site, contained TDS concentration ranging from 2,616 mg/L (MW-5D) to 608 mg/L (MW-6S) with chloride ranging from 57 mg/L to 1,168 mg/L. These data indicate that the CEMEX site and areas inland have been intruded, to varying degrees, with seawater. As discussed in **Appendix E3**, the range of TDS/chloride concentrations indicate that certain areas are undergoing different stages of seawater intrusion, which has to do with an ion exchange between the soil and the incoming seawater, and the shape of the seawater intrusion wedge (seawater intrusion occurs in a wedge shape where, because of higher density seawater, the leading edge is in the lower portion of the aquifer). As discussed in detail in **Appendix E3**, Section 3.1.7.2, calcium and chloride in the groundwater concentrations can be used to evaluate the stages of seawater intrusion. For example, elevated sodium and chloride in MPWSP monitoring wells MW-1S, MW-1M, MW-3S, MW-3M, MW-4S, MW-4M, MW-8S, MW-8M, MW-9S, and MW-9M indicate later stages of seawater intrusion, while calcium and chloride concentrations in the monitoring wells MW-6M(L), MW-7S, and MW-7M

[21] The low TDS encountered in MW-9D may represent a density differences in the upper part of the aquifer at this location or not being proximate to local pumping stresses (HWG, 2017). However, this is consistent with the seawater intrusion mapping conducted by MCWRA for the 400-Foot Aquifer in this location, as shown on Figure 4.4-11

is typical of early to middle stage seawater intrusion. As another example, the relatively low to moderate salinity reported at well MW-6M (966 mg/L TDS and 167 mg/L chloride) is likely due to the well's location towards the leading edge of seawater intrusion in the 180-Foot Aquifer and the shape of the seawater intrusion wedge causing more saline water to reside in the lower portion of aquifer.

Seaside Groundwater Basin

Groundwater pumping from aquifers in the SGB has exceeded recharge and freshwater inflows that caused pumping depressions near the coast, as shown on the groundwater flow maps for both the shallow aquifer zone (see **Figure 4.4-7**) and the deep aquifer zone (see **Figure 4.4-8**) (HydroMetrics, 2015). In addition, seawater intrusion has occurred just north of the SGB in the adjacent 180/400 Foot Aquifer Subbasin of the SVGB, as discussed above. The boundary between these two basins is a groundwater divide that migrates in response to variations in natural recharge and pumping on either side of the divide. HydroMetrics noted increased chloride concentrations in two wells along the coast, although the concentrations have not yet exceeded drinking water standards. These conditions all suggest that the SGB could be vulnerable to seawater intrusion.

Recent Geophysical Studies of Seawater Intrusion in the SVGB

Electrical Resistivity Tomography (ERT) is a geophysical survey method that measures electrical resistance through a material to create images of subsurface geologic and geochemical features and conditions. Electrical resistivity imaging uses a series of sensors (referred to as electrodes) that get placed along a transect line on the ground surface. A direct electrical current is applied to the electrodes and the resulting electrical field is measured along the ground using a second pair of electrodes, referred to as dipoles. The decrease in electrical current detected by the receiving dipoles is recorded and the resistivity is calculated based on the measured voltage, the distance between the electrodes, and the electric current flowing between electrodes. Computers then process the data to represent a two-dimensional cross-sectional image of the subsurface. The high and low resistivity zones in the subsurface are displayed as a series of colors in a cross section that represent variations in electrical resistivity, which can be interpreted as variations in the content of seawater, fresh water, or varying intermediate concentrations of brackish water (i.e., water with a salinity in between seawater and fresh water).

Stanford Professor Dr. Rosemary Knight's graduate and post-graduate students and staff have completed two recent ERT surveys along the beach of Monterey Bay near the proposed project site. The first study was conducted in 2011-12 and included one four-mile long line along the beach from Seaside to Marina (Pidlisecky et al., 2016), south of the location of the proposed slant wells. This pilot study was intended to demonstrate the viability of using large-offset ERT to image the distribution of subsurface freshwater and saltwater over a large area and gain insight into the distribution and geologic controls of seawater intrusion in the Monterey Bay region. In 2014-15, a second, more extensive ERT study was conducted along a 25-mile transect of Monterey Bay coastline (Goebel et al., 2017), extending from the Santa Cruz Mid-County Basin in the north, through a portion of the Pajaro Valley Groundwater Basin as well as a portion of the

Salinas Valley Groundwater Basin, to the Seaside Basin in the south.[22] The purpose of that survey was to map the salinity of groundwater and further delineate the location and extent of seawater intrusion. The study determined that the electrical resistivity readings positively correlated with measured TDS concentrations to a depth of about 500 feet in the Seaside Basin Water Master (SBWM) Monitoring Wells SBWM-1 thru SBWM-4 and supported the understanding that the deeper aquifers in the Seaside Basin have not yet been affected by seawater intrusion.

In May 2017, Dr. Knight, in conjunction with MCWD, conducted a third geophysical survey of the coastal area of the SVGB near Marina using airborne electromagnetics (AEM) (Stanford AEM study, Gottschalk and Knight, 2017, see Section 8.5.2). This survey extended inland east from the Monterey Bay to Highway 183, and north to Soquel, including portions of the Pajaro Valley and Santa Cruz Mid County groundwater basins. The survey used an antenna suspended from a helicopter to generate a magnetic field, which was detected by the receiver. The received signal was then converted to resistivity data and that data was inverted to produce output like that obtained from ERT but can be viewed as a 3-dimensional image. The Stanford AEM study data relied on subsurface information provided by geophysical borehole logs from monitoring wells drilled by CalAm in 2015 as part of the MPWSP.

The HWG overlaid the known regional hydrostratigraphy on the AEM cross sectional profile generated by the Stanford AEM study to show the perched and regional water tables (see **Appendix E3**, Section 3.1.8). The overlay showed consistency between MPWSP monitoring well data and the hydrogeologic conceptual model developed by the HWG. In addition, HWG modified the AEM resistivity profile to more correctly illustrate the distribution of water quality in the aquifers using the same control points but using known groundwater conductivity measured in the monitoring wells during May 2017. The results showed a distribution of groundwater chemistry that is consistent with the findings of the HWG hydrogeologic investigation and generally consistent with the salinity mapping for the 180-Foot and 400-Foot Aquifers published by the MCWRA. The Stanford study also provides data to help interpolate between control points provided by the MPWSP monitoring network and confirms the work completed for the hydrogeologic investigation regarding the distribution of water quality in the MPWSP study area.

Regional Sources of Groundwater Contamination

Former industrial, commercial, and military activities in the region have resulted in soil and groundwater contamination from spills, leaking underground tanks, unlined chemical disposal sites, and inadvertent disposal of chemicals. In particular, groundwater in the aquifers located beneath the former Fort Ord military base, within two miles southeast of the proposed slant well locations at the CEMEX sand facility, are contaminated with volatile organic compounds, mostly trichloroethene (TCE) and carbon tetrachloride. Section 4.7, Hazards and Hazardous Materials, discusses these areas of contamination (see **Figures 4.7-1** and **4.7-2** for the locations of known plumes in the region). The closest of these contaminant plumes to the proposed slant wells,

[22] In both the 2011 and 2014 ERT studies, the Dr. Knight's team could not gain access to the beach within the CEMEX property and thus a data gap exists in the resistivity profiles at the CEMEX property for both studies.

known as the OUCTP A-Aquifer Plume and the OUCTP Upper 180-Foot Aquifer Plume, are present in the indicated aquifers of the SVGB in the vicinity of Reservation Road, east of Del Monte Boulevard in Marina. These plumes have undergone considerable investigation, source removal, and remedial action, and the extent of contamination and constituent concentrations have decreased over time.

4.4.2 Regulatory Framework

This section provides an overview of federal, state, and local environmental laws, policies, plans, regulations, and guidelines (referred to generally as "regulatory requirements") relevant to groundwater resources. A brief summary of each is provided, along with a finding regarding the project's consistency with those regulatory requirements. The consistency analysis is based on the project as proposed, without mitigation. Where the project, as proposed, would be consistent with the applicable regulatory requirement, no further discussion of project consistency with that regulatory requirement is provided. Where the project, as proposed, would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to the specific impact discussion in Section 4.5.5, Direct and Indirect Effects of the Proposed Project, below, where the potential inconsistency is addressed in more detail. Where applicable, the discussion in Section 4.5.5 identifies feasible mitigation that would resolve or minimize the potential inconsistency.

Many of the regulations described in Section 4.3, Surface Water Hydrology and Water Quality, also apply to groundwater resources, including the Porter-Cologne Water Quality Control Act and the *Water Quality Control Plan for the Central Coastal Basin* (Basin Plan). Additional information on the Basin Plan for the Central Coast Regional Water Quality Control Board (RWQCB), as it applies to groundwater resources, is provided below.

4.4.2.1 Federal

Federal Antidegradation Policy

Section 303 of the Clean Water Act (CWA) (33 U.S.C. § 1313) requires that states adopt water quality standards for waters of the United States within their applicable jurisdiction. Such water quality standards must include, at a minimum, (1) designated uses for all waterbodies within their jurisdiction, (2) water quality criteria necessary to protect the most sensitive of the uses, and (3) antidegradation provisions. Antidegradation policies and implementing procedures must be consistent with the regulations in 40 C.F.R. § 131.12. Antidegradation is an important tool that states use in meeting the CWA requirement that water quality standards protect public health and welfare, enhance water quality, and meet the objective of the Act to "restore and maintain the chemical, physical and biological integrity" of the nation's waters. The CWA requires that states adopt antidegradation policies and identify implementation methods to provide three levels of water quality protection to maintain and protect (1) existing water uses and the level of water quality, (2) high quality waters, and (3) outstanding national resource waters. The MPWSP would comply with the Federal Antidegradation Policy through the antidegradation policy implemented by California State Water Resources Control Board Resolution 68-18, as described below.

4.4.2.2 State

State Water Resources Control Board (SWRCB) Resolution 68-16 Anti-Degradation Policy

In 1968, the State Water Resources Control Board adopted an anti-degradation policy aimed at maintaining the high quality of waters in California through the issuance of Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining High Quality Waters in California"). The policy prohibits actions that tend to degrade the quality of surface and groundwater. The Regional Water Quality Control Boards oversee this policy (SWRCB, 1968). The anti-degradation policy states that:

- Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies.

- Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters must meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

SWRCB has interpreted Resolution No. 68-16 to incorporate the federal anti-degradation policy, which applies if a discharge that began after November 28, 1975 would lower existing surface and groundwater quality.

This policy would apply to the treated water to be injected into the proposed ASR injection/ extraction wells because this element would be required to comply with the state resolution maintaining the existing water quality. The RWQCB currently regulates the ASR operation under Permit 20808C, which monitors water quality of the ASR injection.[23] Through compliance with Permit 2080C, water quality would be maintained and would, therefore, be consistent with SWRCB State Water Board Resolution 68-16.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides the basis for water quality regulation within California and defines water quality objectives as the limits or levels of water constituents established for the reasonable protection of beneficial uses. The SWRCB administers water rights, water pollution control, and water quality functions throughout California, while the Central Coast RWQCB conducts planning, permitting, and enforcement activities. The Porter-Cologne Act requires the RWQCB to establish a regional

[23] The RWQCB regulates ASR operations throughout California under SWRCB Order 2012-0010 General Waste Discharge Requirements for Aquifer Storage and Recovery Projects that Inject Water into Groundwater. However, the MPWMD operates the Seaside Basin ASR wells under Permit 20808C, which predates the statewide order.

Basin Plan with water quality objectives, while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. Beneficial uses, together with the corresponding water quality objectives, are defined as standards, per federal regulations. Therefore, the regional basin plans form the regulatory references for meeting state and federal requirements for water quality control. Changes in water quality are allowed if the change is consistent with the maximum beneficial use of the State waters, it does not unreasonably affect the present or anticipated beneficial uses, and it does not result in water quality less than that prescribed in the water quality control plans. The basin plan regulations also apply to groundwater. The Basin Plan for this location is discussed below in the local regulations subsection.

This Act would apply to the ASR injection/extraction wells because they would have potential to affect water quality and beneficial uses in the Basin through injection of desalinated water. Thus, the proposed project would be required to comply with the Basin Plan water quality objectives established by the Central Coast RWQCB to protect the beneficial uses of the groundwater. This is discussed in the Local Regulations subsection below. Through compliance with the Basin Plan's water quality requirements, the proposed project would be consistent with the Act.

Central Coast Regional Water Quality Control Plan (Basin Plan)

Under the Porter-Cologne Water Quality Control Act, the RWQCB is responsible for authorizing and regulating activities that may discharge wastes to surface water or groundwater resources. The California Water Code (Section 13240) requires the RWQCB to prepare and adopt water quality control plans, or Basin Plans. According to Section 13050 of the California Water Code, Basin Plans designate the waters within a specified area of beneficial uses to be protected, water quality objectives to protect those uses, and a plan to meet the objectives. One significant difference between the State and Federal programs is that California's Basin Plan established standards for groundwater in addition to surface water.

The Basin Plan for the Central Coast, originally adopted in 1971 and last amended in 2011, identifies the beneficial uses of water bodies and provides water quality objectives and standards for waters of the Central Coast of California. The listed beneficial uses for groundwater resources are

- Agricultural water supply (AGR)
- Municipal and domestic water supply (MUN)
- Industrial use (IND)

General objectives are established for taste, odor, and radioactivity; for municipal and domestic supply, additional general objectives are established for bacteria, organic chemicals, and various chemical constituents; and for agricultural supply, general objectives follow the guidelines for water quality from the University of California Agricultural Extension Service. In addition, agriculture supply must be handled such that no controllable water quality factor shall degrade the quality of any groundwater resource or adversely affect long-term soil productivity.

The RWQCB has established water quality objectives for selected groundwater resources; these objectives serve as a basis for evaluating water quality management in the basin. Specific water quality objectives have been defined for the 180-Foot Aquifer and 400-Foot Aquifer for the SVGB, as listed in **Table 4.4-6** below.

TABLE 4.4-6
GROUNDWATER QUALITY OBJECTIVES

Aquifer	Total Dissolved Solids	Chloride	Sulfate	Boron	Sodium	Nitrate as Nitrogen
180-Foot	1500	250	600	0.5	250	1
400-Foot	400	50	100	0.2	50	1

NOTES: All concentration are in milligrams per liter (mg/L)

SOURCE: RWQCB, 2011b.

The Basin Plan would apply to the treated water to be injected into the proposed ASR injection/extraction wells because it could affect the quality and beneficial uses of the Basin's groundwater. Accordingly, these project elements would be subject to regular water quality monitoring by the RWQCB. This water quality monitoring would ensure that any deviation from the established objectives is identified and corrected pursuant to Basin Plan requirements.

Central Coast Regional Water Quality Control Board – Resolution R3-2008-0010, General Waiver for Specific Types of Discharges

In conjunction with the SWRCB Order No. 2003-0003-DWQ, described above, Resolution No. R3-2008-0010 waives the submittal of Reports of Waste Discharge and the issuance of Waste Discharge Requirements for certain low volume discharges with minimal pollutant concentrations. The order includes well development water, monitoring well purge water, and boring waste discharge. This order would allow the listed wastes to be discharged directly to the land surface as long as the discharge is implemented in a controlled manner that does not cause erosion or other adverse effects. The RWQCB Regional Water Board's Resolution includes the injection and extraction of treated groundwater, such as with the ASR system, as long as the RWQCB Regional Water Board reviews and approves of the system design and operation. The anticipated volumes and quality of well development water, monitoring well purge water, and soil boring waste discharge generated by the proposed project would comply with the requirements of this resolution, thereby ensuring project consistency.

Division of Water Rights Permit 20808 – Amended Permit for Diversion and Use of Water

In 1995, the State Water Resources Control Board (SWRCB) issued Permit 20808 to the Monterey Peninsula Water Management District (MPWMD) for the proposed Los Padres Reservoir project. The permit was later split and modified several times, and now addresses additional requirements for the diversion of surface and under stream flow from the Carmel River, protection of the Carmel Lagoon and fish habitat, and the injection and storage of Carmel River water in the Seaside Basin using the ASR injection/extraction wells. The MPWMD and CalAm now jointly own Permits 20808A and 20808C, which total 5,326 acre feet per year. The ASR project that diverts excess water off of the Carmel River operates under Permits 20808A and 20808C.

A requirement to limit recovered water to 1,500 acre feet in any given year is associated with a side agreement between MPWMD, CalAm, and the California Department of Fish and Wildlife (CDFW) concerning recovery of water injected into the Seaside Basin under Permit 20808A. The Quarterly Water Budget Group which was set up to determine how the CalAm system should be operated, can decide to extract less. This agreement does not include water recovered under Permit 20808C. However, Condition 7 in the Cease and Desist Order (CDO) (see Section 2.2.3, State Water Board Order 95-10 and Cease and Desist Order 2016-0016, for discussion) requires that all water injected under either Permit 20808A or 20808C be recovered in the same year, unless the CDFW and the National Marine Fisheries Service (NMFS) agree to an alternate recovery plan. Under the CDO, the first 600 acre feet per year of water diverted to ASR in any water year must go toward offsetting Carmel River diversions in the water year it is diverted.

These requirements and others placed by the SWRCB on ASR recovery will be lifted once the CDO is met; thus, these limits will not be an operational or budgetary limit after replacement supplies are operational and CalAm has reduced its Carmel River diversions to authorized amounts.

MPWMD owns Permit 20808B for 18,674 acre feet per year, which is referred to as the "remainder" permit and is associated with a project to build a new main stem reservoir on the Carmel River downstream of the existing Los Padres Dam. That permit has a different set of instream flow requirements that were fixed to the permit by the SWRCB in 1995 prior to NMFS listing steelhead as a threatened species. No water has been diverted under Permit 20808B to date. Implementation of the proposed project would allow CalAm to more effectively utilize its Carmel River water rights by increasing its capacity to inject water for storage when river flows are sufficiently high to allow for diversion. CalAm is presently operating within the terms of the permit and nothing about the proposed project would change its ability to operate consistent with the permit.

State Water Resources Control Board Order No. 2003-0003-DWQ, *Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality*

SWRCB Order No. 2003-0003-DWQ established statewide Waste Discharge Requirements regulating certain low-volume discharges that contain minimal pollutant concentrations, thus allowing for their discharge to land without the preparation of a Report of Waste Discharge. The order includes provisions to address well development water, and to monitor well purge water and the discharge of material generated during drilling. This order allows discharge of the listed wastes directly to the land surface as long as the discharge is implemented in a controlled manner that does not cause erosion or other adverse effects. The Central Coast RWQCB General Order WQ-2011-0223, *Waste Discharge Requirements NPDES General Permit for Discharges with Low Threat to Water Quality*, and its Resolution R3-2008-0010, *General Waiver for Specific Types of Discharges*, provide additional details on how this order would apply to the proposed project. The anticipated volumes and quality of well development water, monitoring well purge water, and soil boring waste discharge would be in quantities typical for temporary water well drilling projects in areas with no existing groundwater contamination. Thus, the proposed project's well development discharges would be consistent with the Order.

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA) was adopted in 2014 and became effective January 1, 2015. SGMA gives local agencies the authority to customize groundwater sustainability plans to their regional economic and environmental needs and manage groundwater in a sustainable manner to protect groundwater resources. SGMA establishes a definition of sustainable groundwater management and a framework for local agencies to develop plans and implement sustainable management strategies to manage groundwater resources, prioritizes basins (ranked as high- and medium-priority) with the greatest problems (i.e., the undesirable results as discussed below), and sets a 20-year timeline for implementation.

The DWR and the SWRCB are the lead state agencies responsible for developing regulations and reporting requirements necessary to carry out SGMA. DWR sets basin prioritization, basin boundaries, and develops regulations for groundwater sustainability. The SWRCB is responsible for fee schedules, data reporting, probationary designations and interim sustainability plans (DWR, 2016a). The State of California has designated the Salinas Valley as a priority basin and stakeholders have been working since 2015 to form a Groundwater Sustainability Agency for the Salinas Valley. The MPWMD applied to alter the boundaries of the Seaside/Corral de Tierra areas so they are similar to the adjudicated boundaries of the Seaside Basin. While SGMA does not have a direct impact on the MPWSP, it is included here as it is new legislation affecting both the Salinas Valley Groundwater Basin and the boundaries of the adjudicated Seaside Basin.

SGMA requires the creation of a Groundwater Sustainability Agency (GSA) for medium- and high-priority groundwater basins in accordance with Water Code §10723 et seq. Each GSA is to develop and implement a Groundwater Sustainability Plan (GSP) in accordance with Water Code §10727 et seq. The GSP would describe how users of groundwater within the basin would manage and use groundwater in a manner that can be sustainably maintained during the planning and implementation horizon without causing undesirable results. SGMA defines undesirable results as follows:

- Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply
- Significant and unreasonable reduction of groundwater storage
- Significant and unreasonable seawater intrusion
- Significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies
- Significant and unreasonable land subsidence that substantially interferes with surface land uses
- Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water

The proposed project would not adversely affect groundwater management in the Basin because it would be extracting groundwater that is not presently being used as a potable or an irrigation supply. Rather, when considering seawater intrusion and water surface elevations in the 400-Foot Aquifer, the proposed project may have a positive contribution to the sustainable management of groundwater. Regarding the former, pumping near the coast would capture the seawater that otherwise would have continued to flow inland. With respect to the latter, the high-quality return water coming from the desalination plant would replace water currently being pumped from wells, allowing groundwater levels to recover in the 400-Foot Aquifer. For these reasons, the proposed project would not conflict with SGMA.

4.4.2.3 Regional and Local

MCWRA Act (1995) (Agency Act)

In accordance with the Agency Act, MCWRA is charged with preventing the waste or diminution of the water supply in its territory by, among other things, controlling groundwater extractions and prohibiting groundwater exportation from the SVGB (MCWRA, 1995). Specifically, section 9(v) of the Agency Act provides that MCWRA has the power:

> To prevent the export of groundwater from the SVGB, except that use of water from the basin on any part of Fort Ord shall not be deemed such an export. Nothing in this act shall be deemed to prevent the development and use of the Seaside Groundwater Basin for use on any lands within or without that basin.

If any person or entity attempts to export groundwater from the SVGB, the MCWRA may seek an injunction from the Monterey Superior Court to prohibit such export.

The Agency Act further authorizes the MCWRA to commission groundwater studies to determine whether any portion underlying its territory is threatened with the loss of useable groundwater supply and to adopt an ordinance prohibiting further extraction of groundwater from an area and depth defined by the MCWRA.

As discussed more fully in Section 2.6, Water Rights, given the locations of the slant well screens beyond the jurisdictional boundaries of the County, it is not clear whether the Agency Act applies to the proposed project. However, as further discussed in that section, were the Agency Act to apply, it is preliminarily reasonable to conclude that the proposed project would be consistent. This is because the proposed project would return to the SVGB any incidentally extracted useable groundwater. The water available for export would be new supply, or developed water, not extracted from the SVGB.

MCWRA Ordinance 3709

MCWRA Ordinance 3709 prohibits drilling into and/or pumping groundwater from the 180-Foot Aquifer within specific onshore areas, designated as Territories A and B (MCWRA, 1993). However, since the CEMEX parcel within which the proposed subsurface intake system would be located is not in either Territory A or B, the MCWRA Ordinance 3709 does not apply to the proposed project and the proposed project would therefore, be consistent (MCWRA, Personal Communication, 2018). This issue is discussed further in Section 2.6, Water Rights.

Seaside Groundwater Basin Watermaster (California Superior Court, Monterey California, Case No. M66343)

In 2006, through the adjudication of the Seaside Basin, the Monterey County Superior Court created the Seaside Groundwater Basin Watermaster. The purpose of the Watermaster is to assist the court in administering and enforcing the provisions of the judgment, which pertains to the oversight and management of Seaside Groundwater Basin resources. The Watermaster's objective is to help resolve the problems of lowered groundwater levels and the threat of seawater intrusion, which are the result of over-pumping. A primary objective of the proposed project is to reduce drawdown of Seaside Basin groundwater levels. Thus, through its implementation, the proposed project would be consistent with the adjudication of the Seaside Basin.

4.4.2.4 Consistency with Applicable Regional and Local Land Use Plans and Policies Relevant to Groundwater

Table 4.4-7 describes the regional and local land use plans, policies, and regulations pertaining to groundwater that are relevant to the MPWSP and that were adopted for the purpose of avoiding or mitigating an environmental effect. Section 4.8, Land Use, Land Use Planning, and Recreation, presents a general overview of these policy documents. Also included in **Table 4.4-7** is an analysis of project consistency with such plans, policies, and regulations. The analysis concludes that the proposed project would not conflict with any applicable plan, policy, or regulation, as noted in the table.

TABLE 4.4-7
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GROUNDWATER RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone & inland areas)	Marina Municipal Code	Water Wells	Subsurface slant wells and monitoring wells for Subsurface Intake System	***Section 13.12.030 Permit—Required.*** No person shall construct, repair, reconstruct, abandon, or destroy any well unless a written permit has first been obtained from the County of Monterey.	This policy is intended to protect public health and safety by ensuring wells are properly constructed, maintained, and decommissioned.	Consistent: The applicant proposes and would be required to obtain a Well Construction Permit from the Monterey County Department of Environmental Health prior to commencement of project well construction.
County of Monterey (coastal zone & inland areas)	Monterey County Code	Water Wells	Subsurface slant wells and monitoring wells for Subsurface Intake System	***Section 15.08.030 Permit—Required*** a. No person shall construct, repair, reconstruct or destroy any well, abandoned well, cathodic protection well, observation well, monitoring well, or test well unless a written permit has first been obtained from the Health Officer of the County or his or her authorized representative as provided in this Chapter.	This policy is intended to protect public health and safety by ensuring wells are properly constructed, maintained, and decommissioned.	Consistent: The applicant proposes and would be required to obtain a Well Construction Permit from the Monterey County Department of Environmental Health prior to commencement of project well construction.
County of Monterey (coastal zone & inland areas)	Monterey County Code	Water Wells	Subsurface Slant Wells and monitoring wells for Subsurface Intake System	***Section 15.08.110 Technical Standards*** a. Standards. Standards for the construction, repair, reconstruction of or destruction of wells shall be as set forth in Chapter II and Appendices A, B, C D of the Department of Water Resources Bulletin No. 74-81, "Water Well Standards" (December, 1981).	This policy is intended to protect public health and safety by ensuring wells are properly constructed, maintained, and decommissioned.	Consistent: All wells within the State of California are required to be constructed in compliance with DWR Bulletin 74-81.
County of Monterey (coastal zone & inland areas)	Monterey County General Plan	Public Services	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Salinas Valley Return Pipeline, Carmel Valley Pump Station, Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***Policy PS-2.8:*** The County shall require that all projects be designed to maintain or increase the site's pre-development absorption of rainfall (minimize runoff), and to recharge groundwater where appropriate. Implementation shall include standards that could regulate impervious surfaces, vary by project type, land use, soils and area characteristics, and provide for water impoundments (retention/detention structures), protecting and planting vegetation, use of permeable paving materials, bioswales, water gardens, and cisterns, and other measures to increase runoff retention, protect water quality, and enhance groundwater recharge.	This policy is intended to minimize the impacts of new impervious surfaces to increase runoff retention, protect water quality, and enhance groundwater recharge.	Consistent: Most of the Subsurface Intake System and water conveyance pipelines would be buried below the ground surface, mainly within existing developed or disturbed areas, and would therefore result in no effect on the absorption of rainfall. The MPWSP Desalination Plant and the Carmel Valley Pump Station would be constructed in unpaved areas and all rainwater would be routed to the permeable surrounding sandy soils.
County of Monterey (coastal zone & inland areas)	Monterey County General Plan	Public Services	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline/Brine Mixing Box, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy PS-2.9:*** The County shall use discretionary permits to manage construction of impervious surfaces in important groundwater recharge areas in order to protect and manage groundwater as a valuable and limited shared resource. Potential recharge area protection measures at sites in important groundwater recharge areas may include, but are not limited to, the following: a. Restrict coverage by impervious materials. b. Limit building or parking footprints. c. Require construction of detention/retention facilities on large-scale development project sites overlying important groundwater recharge areas as identified by Monterey County Water Resources Agency. The County recognizes that detention/retention facilities on small sites may not be practical, or feasible, and may be difficult to maintain and manage.	This policy is intended to preserve impervious surfaces to increase runoff retention, protect water quality, and enhance groundwater recharge.	Consistent: Most of the Subsurface Intake System and water conveyance pipelines would be buried below the ground surface, mainly within existing developed or disturbed areas, and would therefore result in no effect on recharge. The MPWSP Desalination Plant and the Carmel Valley Pump Station would be constructed in unpaved areas and all rainwater would be routed to the permeable surrounding sandy soils.
County of Monterey (coastal zone & inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Salinas Valley Return Pipeline, Carmel Valley Pump Station, Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***Policy S-3.2:*** Best Management Practices to protect groundwater and surface water quality shall be incorporated into all development.	This policy is intended to protect surface water and groundwater quality from impacts of development.	Consistent: The proposed project would be subject to the State Construction General Permit, the Monterey County Grading Ordinance, the Monterey County Erosion Control Ordinance, and the RWQCB Resolution R3-2013-0032c, which require the implementation of specific construction-related BMPs to prevent concentrated stormwater run-on/runoff, soil erosion, and release of construction site contaminants. Surface water quality is also discussed in Section 4.3 Surface Water Hydrology and Water Quality.
County of Monterey (coastal zone)	North County Land Use Plan	Water Resources	Source Water Pipeline and New Desalinated Water Pipeline	***Policy 2.5.1:*** The water quality of the North County groundwater aquifers shall be protected, and new development shall be controlled to a level that can be served by identifiable, available, long term-water supplies...	This policy is intended to maintain the quality of groundwater resources and reduce overdraft of basin groundwater supplies.	Consistent: Water conveyance pipelines would be buried below the ground surface, mainly within existing developed or disturbed areas, and would therefore result in no effect on groundwater quality or recharge.

TABLE 4.4-7 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GROUNDWATER RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
Fort Ord Reuse Authority (City of Seaside)	Fort Ord Reuse Plan	Conservation	ASR Conveyance Pipeline, and ASR Pump-to-Waste Pipeline	**Hydrology and Water Quality Policy A-1:** At the project approval stage, the City shall require new development to demonstrate that all measures will be taken to ensure that runoff is minimized and infiltration maximized in groundwater recharge areas.	This policy is intended to preserve impervious surfaces to increase runoff retention, protect water quality, and enhance groundwater recharge.	Consistent: The above-ground components of the proposed ASR system would be constructed in unpaved areas. All rainwater would be routed to the surrounding unpaved sandy areas and allowed to infiltrate into the subsurface as recharge. The below-ground components would not affect groundwater recharge.

SOURCES: FORA, 1997; Monterey County, 1982; Monterey County, 2010

4.4.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to groundwater resources if it would:

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Violate any ground water quality standards or otherwise degrade groundwater quality.

The following descriptions have been developed to elaborate on how these criteria are applied in the impact analyses in Sections 4.4.5.1 and 4.4.5.2, below. Implementation of the proposed project would be considered to have a significant impact associated with groundwater resources if:

- Construction reduced groundwater supplies, or substantially hindered the ability of surface water to recharge the aquifer, resulting in substantially lower groundwater levels.
- Construction discharges to groundwater exceeded water quality standards or otherwise degraded groundwater quality.
- Extraction from the subsurface slant wells substantially depleted groundwater in the SVGB such that there would be a substantial net deficit in aquifer volume.[24]
- Extraction from the subsurface slant wells lowered groundwater levels in the Dune Sand Aquifer or the 180-Foot Equivalent Aquifer so that nearby municipal or private groundwater production wells experienced either a substantial reduction in well yield or physical damage due to exposure of well screens and well pumps.
- Operation of the proposed ASR injection/extraction wells resulted in groundwater mounding, change in groundwater gradients, or lower groundwater levels such that nearby municipal or private groundwater production wells experienced either a substantial reduction in well yield or physical damage due to exposure of well pumps or screens.
- Extraction from the subsurface slant wells interfered substantially with groundwater recharge.
- Extraction from the subsurface slant wells adversely affected groundwater quality by exacerbating seawater intrusion in the SVGB.
- Injection of desalinated water treated to drinking water standards degraded the quality of native groundwater in the SGB.
- Operation of the proposed ASR injection/extraction wells were to result in discharges to groundwater resources that degrade groundwater quality.

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[24] A substantial net deficit in aquifer volume refers to the removal of groundwater from the aquifer at a rate that exceeds natural recharge, such that: 1) groundwater levels are permanently lowered and could not recover to pre-pumping conditions; 2) production well yields in neighboring wells decline to such a degree that other groundwater users in the basin experience an intolerable decrease in available groundwater supply; or 3) the lowering of groundwater results in subsidence and compaction that reduces the available volume of groundwater storage.

4.4.4 Approach to Analysis

Four primary sources of data and information were used to guide the impact analysis presented in this section: 1) information obtained through subsurface investigations commissioned by CalAm that was subsequently peer reviewed by the EIR/EIS preparers; 2) groundwater modeling conducted by experts on the EIR/EIS team (see Appendix E2); 3) the SWRCB Final Review of California American Water Company's Monterey Peninsula Water Supply Project (see Appendix B2), and; 4) CalAm operating rules for injection and extraction of desalinated water by ASR (see Section 3.4.2). The following sections describe the details of these four elements of the impact analysis methodology.

4.4.4.1 Subsurface Investigations

Until recently, the general understanding of the subsurface geology near the CEMEX site was limited to information obtained from a few nearby wells, or from detailed investigations at distant locations, such as Marina State Beach or the former Fort Ord. Recognizing the need to obtain additional subsurface information to design the proposed project, CalAm commissioned a subsurface soil and groundwater investigation at the CEMEX site and at an alternate intake location at Potrero Road. These field investigations acquired supplemental information on subsurface geologic units, the hydrogeologic properties of those units, and the current aquifer water quality. This information in turn was used to better understand the hydrogeologic conditions, develop the hydrogeologic conceptual model, and to refine input parameters of the groundwater modeling. Additionally, obtaining data on subsurface stratigraphy and groundwater chemistry at various depth intervals helped refine and optimize construction details of the proposed slant wells. The investigations included drilling exploratory boreholes to identify and correlate the subsurface geologic units, to collect groundwater quality data, and to build clusters of monitoring wells.

The exploratory borehole drilling phase of the field investigation included drilling, logging, and testing of fourteen (14) boreholes within the project area: six (6) boreholes at the CEMEX site, six (6) boreholes around Moss Landing, one (1) borehole at Molera Road, and one (1) at Potrero Road. The details of the subsurface exploration, including boring logs, well construction details, field screening tests results, and laboratory analytical results, are presented in the July 2014 report titled, *Monterey Peninsula Water Supply Project Hydrogeologic Investigation Technical Memorandum TM 1, Summary of Results – Exploratory Boreholes* (**Appendix E3**, see TM1). The HWG peer reviewed TM1 before the final document was released and the EIR/EIS team participated in that peer review process. TM1 is also discussed in Section 4.2, Geology, Soils, and Seismicity.

Test Slant Well

CalAm installed the test slant well to further evaluate subsurface conditions and to test the response of the Dune Sand Aquifer, the 180-FTE Aquifer, and the 400-Foot Aquifer to pumping. The results have been used to refine the groundwater models and inform the analysis of the proposed project. The first phase of the test slant well investigation began with the construction of a 724-foot-long test well drilled at an angle of 19 degrees below horizontal at the CEMEX site. Special Condition 11 of the Coastal Development Permit, “Protection of Nearby Wells,” requires the MPWSP HWG to establish baseline water and TDS levels prior to commencing the long-term pumping tests (Geoscience, 2015b). The long-term pumping test began in mid-April 2015, and results are available at http://www.watersupplyproject.org/#!test-well/c1f1l.

Monitoring Wells Installation and Testing

CalAm developed the groundwater monitoring network to assess the impacts of long-term pumping of the test slant well, assess and continually evaluate the hydrogeologic technical aspects of the project, evaluate potential impacts on critical inland water resources, and assess the movement of ocean water into the test slant well, and collect data to calibrate groundwater models.

CalAm’s groundwater monitoring phase of work involved installing monitoring well clusters, which took place between December 2014 through August 2015 (see **Figure 4.4-9**). The monitoring well clusters at the CEMEX site are MW-1, MW-3, and MW-4 located west to east along the CEMEX access road, from the proposed slant well location to the CEMEX facility entrance; MW-4 is the compliance well identified in the Coastal Development Permit issued by the Coastal Commission for the operation of the test slant well. Off-site monitoring wells, which provide regional data for evaluation of potential impacts, include MW-5, MW-6, MW-7, MW-8, and MW-9, which are located at the proposed desalination plant site on Charles Benson Road, at the intersection of Lapis Road and Del Monte Road, and along West Blanco Road about 4 miles southeast of the CEMEX site. The established monitoring well network is equipped with water level transducers and conductivity transmitters that continually log information in 5 to 15-minute intervals, depending on the specific well completion. Each monitoring well cluster consists of three wells. The individual wells were drilled to monitor water level and chemistry in the Dune Sand Aquifer (S), the 180-FTE/180-Foot Aquifer (M), and 400-Foot Aquifer (D).[25] In addition to the monitoring wells, CalAm installed a water level data logger in the pond that CEMEX uses to dredge sand to monitor the effects of the test slant well on the CEMEX dredge pond. The details of the subsurface exploration including boring logs, well construction details, field screening tests results, and laboratory analytical results are presented in **Appendix E3**, (Appendix E: *Monterey Peninsula Water Supply Project, Hydrogeologic Investigation, Technical Memorandum (TM2) Monitoring Well Completion Report and CEMEX Model Update* (Geoscience, 2016b). The HWG peer reviewed TM2 before the final document was released and the EIR/EIS team participated in that peer review; that document is also discussed in Section 4.2, Geology, Soils, and Seismicity. Groundwater elevation and water quality data developed from monitoring the cluster wells are presented in the impact analysis, below.

[25] MW-5S is screened in a perched aquifer that lies above the Dune Sand Aquifer, rather than the Dune Sand Aquifer itself and was designated MW-5S(P) to indicate that it is representative groundwater levels in a perched aquifer. MW-6D is likely in the lower portion of the 180-Foot Aquifer and was re-designated as MW-6M(L) to indicate the deeper portion of the 180-Foot Aquifer.

4.4.4.2 Groundwater Modeling

Groundwater modeling was used to determine the extent of the cone of depression and the capture zone, and therefore, is a primary analytical tool used to evaluate project impacts on groundwater resources. This section describes the groundwater models and how they were used to simulate the groundwater response to the proposed pumping. The results of the groundwater modeling are presented in *North Marina Groundwater Model Review, Revision, and Implementation for Slant Well Pumping Scenarios*, August 31, 2017, prepared by HydroFocus, Inc., a member of the EIR/EIS team (**Appendix E2**).

Groundwater Models

What is a Groundwater Model?

Groundwater models are computer simulations that represent water flow in the environment using mathematical equations. By mathematically representing a simplified version of a hydrogeological system, the effects of groundwater pumping scenarios can be simulated, evaluated, and compared to determine their effects on an aquifer system. The applicability or usefulness of the model depends on how closely the mathematical equations approximate the essential characteristics of the groundwater system being modeled.

Groundwater models consist of individual *cells* in a model *domain*. A domain is the entire area and depth within which the model simulates subsurface conditions. The domain is divided into a number of smaller units called cells, which represent a defined three-dimensional volume of an aquifer. The size and number of cells depend, in part, on the coverage area of the model. For example, models that cover an entire groundwater basin of many square miles may have cells that represent one square mile each, while models designed to evaluate smaller areas have cells representing only 200 square feet. Each cell contains information about the subsurface hydrogeological information inferred from soil borings, well logs, and geologic mapping. Parameter values are assigned to cells to approximate the physical characteristics that affect water movement through the volume of aquifer represented by that cell. Parameters typically include hydraulic conductivity (the ability of water to flow through a given material), and porosity and storage properties (the relative amount of open spaces between grains in the geologic material). Vertical layers are then selected based on the subsurface geologic characteristics, such as permeable aquifer zones and less permeable aquitards. After all of the cells are populated, the model is calibrated against observed groundwater levels measured in monitoring wells so that the model can better represent real world conditions.

Once the model has been populated and calibrated, it can be used to project water movement and storage changes of water beneath the subsurface and quantify changes in groundwater flow and storage as a result of groundwater extraction. The models used for this analysis tested the anticipated response of the aquifer or aquifers to various operating scenarios. The scenarios considered changes in rate and location of project pumping. The results of the scenarios are also compared against baseline, or current conditions, to determine and identify potential effects or impacts.

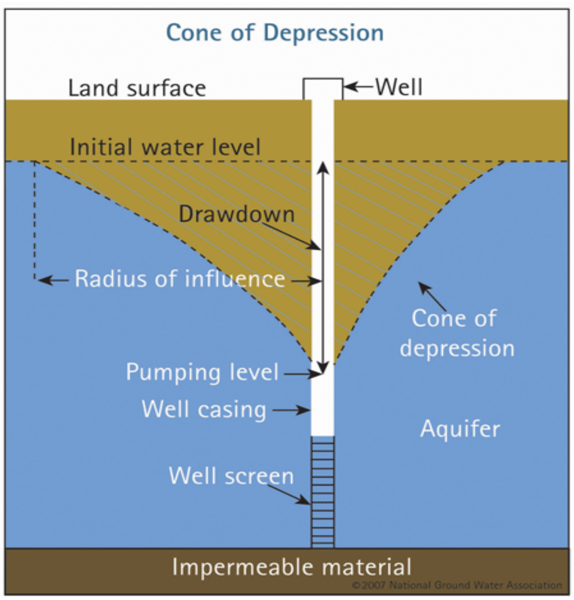
Limitations of Groundwater Models

Groundwater models simulate aquifer conditions based on a specific set of data that describes subsurface characteristics and groundwater flow. The more robust the data set, the more capable the model will likely be to simulate subsurface conditions. Groundwater models are mathematical-based computer programs that rely on specified input data to approximate real-world conditions and, consequently, there is a degree of uncertainty associated with the model output. Most groundwater model analyses tend to employ conservative input parameter values so that the output either understates or overstates the expected actual aquifer response. The models used to analyze the proposed project have been used before and, as part of this study, the models have benefited from input data derived from site-specific subsurface information. Given that, and given the fact that these models were calibrated with known data, the level of degree of uncertainty for this analysis is considered tolerable.

Groundwater Terminology

Certain terminology is used in groundwater analysis to describe and illustrate the nature, extent, and movement of groundwater in aquifers, and the response of the aquifers to changes, such as pumping. In addition to calculated values (e.g., changes in the volume of water in storage), the spatial results of the model simulations are commonly expressed as maps that show the simulated response to the pumping of the wells under various scenarios. The maps show the cone of depression, the radius of influence, and particle tracking, terms that are described and illustrated below.

- **Cone of depression** – As water is extracted from a well, it is pulled into the screened section of the slant wells and removed from the subsurface water-bearing unit. Groundwater elevations would decrease around the slant wells in a distorted ovate fashion due to the ocean recharge boundary such that the cone of depression would not be centered at the slant wells. This cone would be the steepest and deepest closest to the well screen and rapidly become flatter and shallower away from the slant wells.



SOURCE: http://www.ngwa.org/Fundamentals/use/PublishingImages/cone_of_depression.gif

- **Capture Zone** – A capture zone refers to the three-dimensional volume of aquifer that contributes the water extracted by the wells. It is a function of drawdown caused by the pumping rate and the regional gradient (direction and slope) of the groundwater flow. In map view, the capture zone is a 2-dimensional surface that delineates the underlying aquifer volume that ultimately becomes the primary source water to the slant wells. The fundamental difference between the capture zone, which is supplying the water to the slant wells, and the cone of depression, which forms in response to pumping, is that the groundwater entering the slant wells originates only from within the capture zone, while the regional gradient controls the groundwater flow beyond the capture zone.
- **Radius of influence** – The radial extent of the area affected by the slant wells—that is, the area within which water levels are anticipated to decrease—is called the radius of influence. The anticipated affected area is depicted using groundwater elevation contour maps. Similar to topographic elevation contours, groundwater contours show the shape and elevations of the groundwater surface. The maximum radius of influence is typically defined as the distance by which the water levels are anticipated to decrease by some amount, such as one foot.
- **Particle tracking** – Using the groundwater elevation maps, the groundwater model can also generate particle tracking maps. Particle tracking maps show the flow path of a particle of water over time. In forward tracking, a particle is placed at a specific cell in the model domain and the model then simulates the path the particle of water will take through other cells as model time moves forward. In reverse tracking, the model simulates the path of where the particle came from, to identify its source.

North Marina Groundwater Model

The NMGWM is a detailed hydrologic computer model covering approximately 149 square miles and includes Elkhorn Slough to Prunedale on the north side, Prunedale to south of Salinas on the east side, south of Salinas to just north of the Fort Ord Dunes State Park on the south side, and extending into Monterey Bay (**Figure 4.4-12**). The NMGWM was originally developed in 2008, integrating information from the regional-scale Salinas Valley Integrated Groundwater and Surface Water Model (SVIGSM) including aquifer parameters, recharge and discharge terms, and boundary conditions in the North Marina area.

The NMGWM is based on model codes of MODFLOW. MODFLOW is a modular finite-difference flow model, which is a computer code that solves the groundwater flow equation. MODFLOW is public domain software that the U.S. Geological Survey developed in the early 1980s. Since MODFLOW's initial release, the USGS has released numerous updated versions, and MODFLOW is now the de facto standard code for aquifer simulation.

The cell size of the NMGWM is 200 feet by 200 feet oriented along 300 rows and 345 columns, and eight layers of variable thicknesses. Details of the review, update, and refinement of the NMGWM used for this analysis, is presented in **Appendix E2**. The product of the 2016 NMGWM update is hereafter referred to as NMGWM^{2016}. **Table 4.4-8** presents a correlation of geologic units, aquifers, and model layers.

SOURCE: Geoscience, 2015c

205335.01 Monterey Peninsula Water Supply Project

Figure 4.4-12
North Marina Groundwater Model Boundaries

TABLE 4.4-8
CORRELATION OF GEOLOGIC UNITS, AQUIFERS, AND MODEL LAYERS

<table>
<tr><th colspan="3">180/400-Foot Aquifer Subbasin</th><th colspan="3">CEMEX Area</th><th colspan="2">Models and Corresponding Horizontal Model Layers</th></tr>
<tr><th>Surface Geologic Units</th><th>Surface Geologic Units Map Symbol</th><th>Hydro-stratigraphic Units</th><th>Surface Geologic Units</th><th>Surface Geologic Units Map Symbol</th><th>Hydro-stratigraphic Units</th><th>North Marina Groundwater Model (NMGWM^{2016})</th><th>CEMEX Model</th></tr>
<tr><td>Ocean Floor</td><td>Qf</td><td>Ocean Floor</td><td>Ocean Floor</td><td>Qf</td><td>Ocean Floor</td><td>1</td><td>1</td></tr>
<tr><td rowspan="3">Alluvium</td><td rowspan="3">Qal(a)</td><td rowspan="3">Perched “A” Aquifer</td><td>Dune Sand</td><td>Qd</td><td rowspan="3">Dune Sand Aquifer</td><td rowspan="3">2</td><td>2</td></tr>
<tr><td rowspan="2">Older Dune Sand</td><td rowspan="2">Qod</td><td>3</td></tr>
<tr><td>4</td></tr>
<tr><td rowspan="2">Older Alluvium</td><td rowspan="2">Qo</td><td rowspan="2">Salinas Valley Aquitard</td><td rowspan="4">Older Terrace/ Marine Terrace</td><td rowspan="4">Qt (Qmt)</td><td rowspan="4">180-Foot Aquifer Equivalent</td><td>3</td><td>5</td></tr>
<tr><td rowspan="3">4</td><td>6</td></tr>
<tr><td>Older Alluvium/ Marine Terrace</td><td>Qo/Qmt</td><td rowspan="2">180-Foot Aquifer Equivalent</td><td>7</td></tr>
<tr><td>Older Alluvium/ Older Alluvial Fan - Antioch</td><td>Qo/Qfa</td><td>8</td></tr>
<tr><td>Older Alluvial Fan – Placentia</td><td>Qfp</td><td>180/400-Foot Aquitard</td><td rowspan="3">Aromas Sand</td><td rowspan="3">Qar</td><td>180/400-Foot Aquitard</td><td>5</td><td>9</td></tr>
<tr><td>Aromas Sand (Undifferentiated)</td><td>Qae</td><td rowspan="2">400-Foot Aquifer</td><td rowspan="2">400-Foot Aquifer</td><td rowspan="2">6</td><td rowspan="2">10</td></tr>
<tr><td>Aromas Sand – Eolian Facies</td><td>Qae</td></tr>
<tr><td rowspan="2">Paso Robles Formation</td><td rowspan="2">QT</td><td>400-900-Foot Aquitard</td><td rowspan="2">Paso Robles Formation</td><td rowspan="2">QT</td><td>400-900-Foot Aquitard</td><td>7</td><td>11</td></tr>
<tr><td>Deeper Aquifer</td><td>Deeper Aquifer</td><td>8</td><td>12</td></tr>
</table>

NOTES:

[a] Subsurface Holocene geologic unit not mapped at surface

SOURCE: Geoscience, 2015c.

The areal extent and thickness of model layers were refined using site specific borings, review and extension of existing geologic cross-sections, revised geologic cross sections and recent aquifer parameter information for the area. The NMGWM model layers and associated parameters such as horizontal and vertical hydraulic conductivity,[26] specific storativity,[27] specific yield,[28] and leakage[29] were refined using the data collected from the site-specific hydrogeologic investigations as described in Appendix E3. In addition, the NMGWM model incorporates the anticipated changes in sea level rise due to global climate change (ESA, 2013).

The following terms and concepts associated with the NMGWM are important to understand while reviewing the impact analyses for groundwater resources presented in this section. **Appendix E2** contains additional details.

Superposition Groundwater Modeling

The superposition approach in groundwater modeling is a well-established analytical tool. For this project, the NMGWM is converted to a superposition model, enabling the NMGWM^{2016} to solve for the groundwater changes due solely to the proposed project. These changes are independent of the effects from the other stresses on the basin such as seasonal climate and agricultural pumping trends, other pumping wells, injection wells, land use, or contributions from rivers. By using superposition, the actual effects of only the proposed project can be isolated from the combined effects of all other basin activity. For example, when the NMGWM^{2016} reports a 1-foot drawdown in a well, it is understood that the one foot of drawdown would be the effect on the basin of the proposed project only. That well may experience greater or lesser drawdown due to other stresses, such as drought or other nearby pumping wells, or may experience increases in water levels due to reduced regional pumping or an extremely wet year. But the proposed project's contribution to that drawdown in the well would remain only 1-foot. Superposition is described in **Appendix E2**, Section 5.2.

Return Water Considerations

The MPWSP proposes to return a certain fraction of water (referred to here as return water) extracted by the slant wells to water users in the SVGB as desalinated product water. As a brief review, the Agency Act does not allow groundwater pumped from the SVGB to be exported for any use outside the SVGB (see full discussion in Chapter 2.6, Water Rights). Since the groundwater in this area has been intruded by seawater for decades, the proposed slant wells at CEMEX would extract brackish water, which is a mixture of ocean water and water originating from the inland aquifers of the basin. The freshwater portion of the brackish source water that originated from the inland aquifers would constitute the proposed return water. To achieve consistency with the Agency Act, the MPWSP proposes to return the freshwater component of the brackish water that is extracted through the slant wells. The exact quantity of water to be returned annually would vary and would be determined each year using a mathematical formula.

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26 Hydraulic conductivity is the rate of water flow through a cross sectional area of an aquifer.

27 Specific storativity is the amount of water taken out or put back into a unit volume of an aquifer when the water level changes.

28 Specific yield is the amount of water that will drain from an aquifer just due to gravity.

29 Leakage is the flow of water from one hydrogeologic unit to another. The leakage may be natural, as through a semi-impervious confining layer, or human-made, as through an uncased well.

However, for groundwater modeling and impact analysis purposes in this EIR/EIS, it is estimated that somewhere between 0 and 12 percent of the source water withdrawn for the project would be returned to the basin. The water would be returned to the SVGB through deliveries of up to 800 afy of desalinated product water to the Castroville Community Services District (CCSD). This water would be piped to the CCSD and the CSIP and provided to water customers instead of their pumping an equal amount from the ground. This method of returning water is referred to as in-lieu recharge because the delivered water would reduce the need to pump groundwater in corresponding quantities. The NMGWM^{2016} accounts for the 0 to 12 percent range by simulating the aquifer response in the various scenarios with a 0, 3, 6, and 12 percent returned product water.

Ocean Water Percentage

Determining how much ocean water would comprise the slant well feedwater (referred to as ocean water percentage, or OWP) has been a concern since the early planning stages of the MPWSP. This is because the converse of the OWP, i.e. the percentage of feedwater that is not ocean water, would be the amount of return water under the proposed project (such that if the OWP were 94 percent, the return water amount would be 6 percent of the source water). The superposition modeling application in the NMGWN^{2016} cannot determine the OWP in the slant well feedwater, so the HWG developed two methodologies to estimate the OWP: an analytical equation and a numerical modeling methodology that uses the existing local CEMEX groundwater model and assumptions from the NMGWM^{2016}. The analytical equation methodology estimates OWP for the proposed 9.6 mgd MPWSP (24.1 mgd extraction rate) and, hence, is discussed here. Both the analytical and numerical modeling methods estimate the OWP for the smaller desalination plant (6.4 mgd output; 15.5 mgd extraction rate) and are therefore discussed in the analysis of Alternatives 5a and 5b in Section 5.5.4. See **Appendix E3**, (section 3.2.3 and Appendix H) for a detailed discussion on the methodology for projecting the OWP.

The analytical equation approach for the 9.6 mgd MPWSP scenario calculated the OWP based on water and salinity budgets for the steady-state[30] capture volume and was evaluated for a range of hydraulic gradients. The water budget represents the steady-state inflows and outflows after equilibrium is reached from MPWSP pumping; results show equilibrium is reached in a few months to a few years. Steady-state inflows are seawater from the Monterey Bay and precipitation that falls over the capture zone. Outflow is water pumped from the slant wells. The hydraulic gradients are related to the size of the capture zone and the time necessary for seawater to flood the capture volume. The analytical methodology was calibrated using test slant well data from April 2015 to October 2016.

The results of the analytical OWP methodology estimated that long-term equilibrium OWP would range between 96 to 99 percent. The OWP is estimated to range from 87 to 93 percent after one year of pumping and from 92 to 97 percent after two years of pumping. The analysis also estimated that the pumping time to reach 90 percent OWP ranged from 4 to 21 months and pumping time to reach 95 percent OWP ranged from 6 to 37 months.

30 Steady state refers to the period where outflow (i.e., slant well pumping) reaches equilibrium with inflow (aquifer recharge from ocean and precipitation).

Model Period

The model period for the NMGWM^{2016} is 63 years. The model scenarios are run over a set time period, beginning with the baseline conditions (no drawdown due to no slant well pumping) and extending out to a future point in time, typically set as the life span of a given project. Over this time period, land use, climate conditions, and, if located along the coast, sea level rise would be expected to change. However, as discussed above, superposition modeling considers only processes that effect changes due solely to project pumping, and in this application, refers only to projected sea level rise over the 63 years of modeled operations.

Sea Level Rise

Sea level along the coast of the Monterey Bay is expected to increase over the next six decades, resulting in a landward migration of the coastline and increased inland groundwater gradients at the coast. Sea level rise can influence the amount of ocean water extracted by slant wells and the resulting drawdown. An increase in sea level hastens the inland advance of ocean water above the underlying well screens, and as a result increases the potential for ocean water to flow into the wells. Between 2012 and 2073, sea level is projected to rise by 18.0 inches (ESA, 2013). The effects of sea level rise were integrated into the analysis by modeling the effects of the current sea level and that expected after 63 years of pumping at the slant wells. The impact analysis refers to current sea level (sea level conditions in 2012, or Model Year 1) and sea level projected for the year 2073, or Model Year 61. As described, in **Appendix E2**, sections 4.3 and 5.2, sea level effects were analyzed by comparing two different model runs. In one run, the sea level is set equal to 2012 conditions, and in the second model run, seal level is set equal to 2073 conditions.

Model Scenarios

Modeling scenarios were developed to project the drawdown from groundwater pumping at the CEMEX site and the alternative location at Potrero Road, and to assess the uncertainty in drawdown to model assumptions and input. A full list of the modeling runs and assumptions is provided in **Appendix E2**, Table 5.2. The scenarios incorporated the slant well pumping rates, sea level rise, four return water percentages, and aquifer distribution in various configurations.

Calibration

Groundwater models are calibrated by comparing the output, such as simulated groundwater levels, to the groundwater levels measured in monitoring wells. The NMGWM^{2016} was calibrated with information provided by the localized CEMEX Model, discussed below, and groundwater levels measured in the monitoring wells installed to evaluate slant well pumping. In addition, the NMGWM^{2016} was calibrated to various monitoring wells in the vicinity, including those installed south of the CEMEX site near Fort Ord. See **Appendix E2** for detailed information on the NMGWM^{2016} calibration methodology.

Sensitivity Analysis

Sensitivity analyses are performed to determine to what degree certain modeling parameters influence the output results. The NMGWM^{2016} development involved analysis of the sensitivity of model-calculated drawdown to uncertainty in pumping rates, return water volumes, and projected sea level rise as well as modeled aquifer parameters and relative contributions of the Dune Sand Aquifer and 180-FT/180-FTE Aquifer to total slant well pumpage. Sensitivity analyses were performed to determine the effects of the aquifer contribution between the Dune Sand Aquifer and the 180-FTE Aquifer and to assess whether varying extraction volumes from each aquifer would alter the modeling results. The NMGWM^{2016} was run under the 0 percent return water scenario for three Dune Sand/180-FTE Aquifer distributions: 21/79, 44/56, and 66/34 percent. The 44/56 aquifer distribution is most likely and is assumed for the impact analyses below. Sensitivity analyses were also used to determine the uncertainty in the model-calculated cone of depression. For 2012 sea level conditions, and 0 percent return water, the maximum distance inland from the proposed MPWSP slant wells to the 1-foot drawdown contour was about 15,000 feet in Model Layer 2 (Dune Sand Aquifer), and about 20,000 feet in Model Layer 4 (180-FTE Aquifer). Due to uncertainties in sea level rise, hydraulic conductivity, and pumping layer allocation distribution, the estimated distances ranged from less than 10,000 feet to 24,000 feet in Model Layer 2, and 12,000 to 24,000 feet in Model Layer 4. Additional details on the sensitivity analyses performed for the NMGWM^{2016} are provided in **Appendix E2**, Section 6.0.

Localized CEMEX Model

The CEMEX model is a MODFLOW-based model that was developed to model the local effects of slant well pumping. Because the monitoring well cluster locations on the CEMEX site are relatively close to the proposed slant well locations, and because the NMGWM^{2016} cell size is 200 feet by 200 feet, it was possible that the slant wells and monitoring well clusters might be located in the same model cell. This proximity could reduce the ability of the NMGWM^{2016} to simulate the changing conditions between the slant and monitoring wells and to estimate the radius of influence during pumping. To address this, the CEMEX model was developed for the immediate area of the slant wells at the CEMEX site with a cell size of 20 feet by 20 feet (Geoscience, 2014a, 2015c, 2016b). The purpose of the CEMEX model is to better evaluate the localized effects of pumping the slant wells, including the cone of depression. Ultimately, the results of this localized model were incorporated into the NMGWM^{2016} results. **Figure 4.4-12** shows the model boundaries of this CEMEX model.

Seaside Groundwater Basin Modeling

The proposed project includes the injection and storage of treated water in the Santa Margarita Sandstone in the SGB as an addition to the ASR program. Groundwater modeling was previously conducted as part of the development of the ASR program and was presented in the *Final Environmental Impact Report/Environmental Assessment for the Monterey Peninsula Water Management District Phase 1 Aquifer Storage and Recovery Project,* dated August 2006 (MPWMD, 2006). The 2006 ASR modeling results were used to understand the response of the aquifers in the SGB to changes and to inform basin management decisions, such as how to operate the ASR program. The results of the SGB modeling were used to evaluate the impacts of the proposed project on the SGB. The SGB model is described below.

The 2006 ASR modeling effort evaluated changes in groundwater levels and long term changes in groundwater storage in the Santa Margarita Aquifer from operation of the ASR wells. The groundwater model was developed utilizing the WinFlow software program, which simulates two-dimensional steady-state and transient groundwater flow, and used published aquifer parameters for the Santa Margarita aquifer. The model simulated the groundwater level and storage response based on an approximate injection volume of 2,426 af over the course of 183 days and extraction volume of 2,002 af over the course of 153 days, which represented the range of likely "extreme" injection and extraction conditions that could be encountered over the life of the ASR project. The results of the groundwater modeling indicated that long term operation of the ASR program would result in a beneficial impact on SGB storage and groundwater levels at existing water supply wells.

Subsequently, HydroMetrics developed the Seaside Basin Groundwater Model for the Seaside Groundwater Basin Watermaster based on MODFLOW-2005 to assist with groundwater management decisions (HydroMetrics, 2009b). The model domain included both the Seaside Basin and the area outside and to the north of the Basin. The model simulates five geologic layers: the Aromas Sand, the upper Paso Robles Aquifer, the middle Paso Robles Aquifer, the lower Paso Robles Aquifer, and the Santa Margarita Sandstone/Purisima Formation. The model simulates groundwater conditions between January 1987 and December 2008. As a part of developing the conceptual model and groundwater simulation, HydroMetrics concluded that the Santa Margarita Sandstone is "highly confined beneath thick clay beds near the ocean, and it does not receive significant deep percolation recharge near the ocean."

4.4.4.3 SWRCB Final Review of California American Water Company's Monterey Peninsula Water Supply Project

The SWRCB evaluation of the proposed project was considered as guidance for the analysis of groundwater impacts because it elucidates and provides context for the nexus between the thresholds of significance used in this section and recommendations and considerations of the SWRCB relative to water rights. Please refer to Chapter 2, Water Demand, Supplies, and Water Rights, which discusses the legal aspects in further detail.

To provide further clarification, on July 31, 2013, the SWRCB reviewed the proposed project (SWRCB, 2013). The SWRCB described its understanding of the physical setting, the components of the proposed project, and the legal analysis regarding the water to be produced by the slant wells.

The SWRCB reviewed the proposed project and provided specific investigation and modeling requirements to demonstrate that the proposed project "will not harm or cause injury to any other legal user of water" from the SVGB (SWRCB, 2013). The SWRCB identified three possible categories of injury that could occur from the MPWSP. The three foreseeable injuries that overlying users could experience are (1) a reduction in the overall availability of fresh water due to possible incidental extraction by the MPWSP; (2) a reduction in water quality in those wells in a localized area within the capture zone, or area of influence; and, (3) a reduction in groundwater elevations that requires users to expend additional pumping energy to extract water from the Basin.

From its review of the project, SWRCB stated that:

> "Key factors will be: (1) how much fresh water Cal-Am extracts as a proportion of the total pumped amount, (to determine the amount of water, that after treatment, would be

> considered desalinated seawater available for export as developed water); (2) whether pumping affects the water table level in existing users' wells, (3); whether pumping affects seawater intrusion within the Basin (4) how Cal-Am returns any fresh water it extracts to the Basin to prevent injury to others; and (5) how groundwater rights might be affected in the future if the proportion of fresh and seawater changes in the larger Basin area or the immediate area around Cal-Am's wells."

> "If overlying groundwater users are protected from injury, appropriation of water consistent with the principles discussed in this report may be possible. To export water outside the Basin, Cal-Am must show 1) the desalinated water it produces is developed water, 2) replacement water methods to return water to the Basin are effective and feasible, and 3) the MPWSP can operate without injury to other users. A physical solution could be employed to assure all groundwater users rights are protected."

The SWRCB recommended the following actions to support the conclusion of no harm:

> "Studies are needed to determine the extent of the Dune Sand Aquifer, the water quality and quantity of the Dune Sand Aquifer, the extent and thickness of the SVA and the extent of the 180-Foot Aquifer."

> "The effects of the MPWSP on the Basin [i.e., the SVGB] need to be evaluated. Specifically, a series of test boring/wells would be needed to assess the hydrogeologic conditions at the site. Aquifer testing also would be needed to establish accurate baseline conditions and determine the pumping effects on both the Dune Sand Aquifer and the underlying 180-Foot Aquifer. Aquifer tests should mimic proposed pumping rates."

> "Updated groundwater modeling will be needed to evaluate future impacts from the MPWSP. Specifically, modeling scenarios will need to be run to predict changes in groundwater levels, groundwater flow direction, and changes in the extent and boundary of the seawater intrusion front. Additional studies also will be necessary to determine how any extracted fresh water is replaced, whether through re-injection wells, percolation basins, or through existing recharge programs. It may also be necessary to survey the existing groundwater users in the affected area. The studies will form the basis for a plan that avoids injury to other groundwater users and protects beneficial uses in the Basin. To ensure that this modeling provides the best assessment of the potential effects of the MPWSP, it is important that any new information gathered during the initial phases of the groundwater investigation be incorporated into the groundwater modeling studies as well as all available information including current activities that could influence the groundwater quality in the Basin."

4.4.4.4 Injection and Extraction of Desalinated Water for the ASR Program

The proposed project includes the injection, storage and extraction of treated water from the desalination plant into the Santa Margarita Sandstone in the SGB as an addition to the ASR program. CalAm would manage the injection and extraction of the Carmel River and desalinated water sent to the ASR system to avoid injecting water to, or extracting water from the ASR system, in a manner that might damage the aquifer, or exacerbate overdraft or seawater intrusion (CalAm, 2014). Specifically, the location of the existing groundwater depression in the SGB must be reviewed each year and extraction may only be conducted in wells located east (up gradient) of the center point of the depression and only in a certain preferential order (ASR wells first, then other specific production wells, as needed) to avoid pumping from near the coastline, which could accelerate seawater intrusion. Section 3.4.2, Operation of the ASR System, provides additional details including the limitations on the rate of injection to prevent over-pressurization and compression of plugging materials in the injection wells.

4.4.5 Direct and Indirect Effects of the Proposed Project

The following impact analyses focus on potential effects on groundwater resources and water quality associated with the proposed project, MPWSP which includes 10 slant wells at CEMEX. The analyses of project impacts considered project plans, current conditions within the project area, applicable regulations and guidelines, and previous environmental assessments. **Table 4.4-9** summarizes the proposed project's impacts and significance determinations related to groundwater resources.

TABLE 4.4-9
SUMMARY OF IMPACTS – GROUNDWATER RESOURCES

Impacts	Significance Determinations
Impact 4.4-1: Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level during construction.	NI
Impact 4.4-2: Violate any groundwater quality standards or otherwise degrade groundwater quality during construction.	LS
Impact 4.4-3: Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level during operations so as to expose well screens and pumps.	LS
Impact 4.4-4: Violate any groundwater quality standards or otherwise degrade groundwater quality during operations.	LSM
Impact 4.4-C: Cumulative impacts related to Groundwater Resources	LS

NOTES:
NI = No Impact
LS = Less than Significant impact, no mitigation proposed
LSM = Less than Significant impact with mitigation

4.4.5.1 Construction Impacts

Impact 4.4-1: Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level during construction. ***(No Impact)***

Impact 4.4-1 addresses the effects on groundwater resources that could occur during the construction of the proposed project. In accordance with the significance criteria (Section 4.4.3 above), a significant impact would occur if construction activity reduced groundwater supplies or substantially hindered the ability of surface water to recharge the aquifer, resulting in lower groundwater levels. Under the MPWSP, temporary groundwater use during installation of the slant wells and the ASR injection/extraction wells could deplete groundwater supplies. Impact 4.4-3, below, evaluates the operational impacts related to the decrease in recharge.

Water Supply for Slant Well and ASR Drilling and Construction

The proposed slant wells and ASR injection/extraction wells would be built using a dual-wall, reverse-circulation rotary drill rig.[31] Some large-scale drilling projects (comparable to the proposed drilling and well construction) require large volumes of water during well drilling to reduce friction in the drill casing and to help flush rock fragments and pulverized cuttings generated from drilling out the borehole. The volume of water needed for the proposed slant well construction could be between 4 to 5 million gallons, but there might be much less, and perhaps none, depending on how the drilling proceeds (Geoscience, 2014b). The water required for ASR injection/extraction well construction would be less. If the proposed project requires well drilling water, it would be purchased from an outside water purveyor and delivered to the drill site by truck; water would not be extracted from local groundwater sources. No impact on local groundwater supplies would occur because the water needed to build the wells would be provided from an offsite water purveyor and would not be extracted from local groundwater sources.

Water Supply for Pipelines and Other Facility Construction

The proposed project pipelines, MPWSP Desalination Plant, and Carmel Valley Pump Station would be built using standard construction methods that would require water for dust suppression, concrete washouts, tire washing, and general site maintenance. Water for these operations would be purchased from a local water purveyor and delivered to each construction site by truck. Construction of these facilities would use water in amounts that are typical for this type of project, and groundwater pumping would not be necessary. Therefore, construction of the pipelines and support facilities would not impact groundwater supplies.

Impact Conclusion

For the reasons stated above, there would be no impacts associated with groundwater supplies and recharge during the construction of project facilities.

Mitigation Measures

None proposed.

Impact 4.4-2: Violate groundwater water quality standards or otherwise degrade groundwater quality during construction. ***(Less than Significant)***

In accordance with the significance criterion (Section 4.4.3, above), a significant impact would occur if construction discharges to groundwater exceeded water quality standards or otherwise degraded groundwater quality. This analysis evaluates whether construction operations, such as

[31] Dual-wall, reverse-circulation rotary drilling uses a drilling rig with two rotary drives. One drive rotates the outer drilling casing into the subsurface with a hardened drive or cutting shoe, while the other drive rotates an inner drill pipe and cutting bit. In reverse circulation, air or water is pumped under pressure down between the outer drill casing and inner drill pipe, and air, water, and cuttings are returned to the surface in the inner drill pipe. Upon reaching the desired depth, the inner drill string is removed and the well casing, filter pack, and surface seal is built inside the outer casing, allowing the well to be built while holding the native formation materials back from the borehole. Upon completion, the outer casing is withdrawn, leaving the finished well in place.

well drilling and the construction of pipelines and other facilities, would result in impacts on groundwater quality. Section 4.3, Surface Water Hydrology and Water Quality, addresses impacts related to surface water quality; Section 4.5, Marine Biological Resources, addresses impacts related to the marine environment.

Water Quality Impacts Associated with Construction of Slant Wells

The nine new slant wells would be built at depths that extend through the Dune Sand Aquifer and the 180-FTE Aquifer, similar to the existing test slant well. The 180-FTE Aquifer is likely hydrologically connected to the inland 180-Foot Aquifer. Inland of the current seawater intrusion front, wells in the 180-Foot Aquifer are used for irrigation and drinking water supplies. The proposed slant wells would be built using a dual-rotary drill rig that uses air, the water already present in the geologic materials, drilling fluid additives, and, when necessary, additional potable water to circulate the drill cuttings. If potable water were added, the quality of that water would be better than that of the underlying brackish water and therefore would not degrade groundwater quality. Considering that the proposed drilling method would only use air, water or mud, there is a very low potential for groundwater degradation to occur during drilling and, thus, this impact would be less than significant.

Water Quality Impacts Associated with Construction of ASR Injection and Extraction Wells

The ASR injection/extraction wells would be drilled without the use of drilling muds containing bentonite clay. However, when necessary, and depending on the formation material encountered, commercially available additives might be combined with the drilling water to increase fluid viscosity and stabilize the walls of the boring to prevent reactive shale and clay from swelling and caving into the hole. Other products would be used to enhance the drilling performance and help reduce the buildup of solids, decrease friction, and aid in reducing solids suspension. Drilling mud additives are commonly used by the well drilling industry for the drilling and installation of groundwater wells, and do not contain chemicals that would degrade groundwater quality. Because the additives are combined with the water and are circulated through the borehole annulus during drilling, they react locally within the borehole and do not migrate into the surrounding groundwater formation. The additives are noncorrosive and biodegradable, and do not contain chemicals that would degrade groundwater quality. Therefore, while the use of drilling fluid additives would be necessary during the drilling of the ASR injection/extraction wells, the potential for degradation to groundwater is low and the impact would less than significant. Section 4.3, Surface Water Hydrology and Water Quality, addresses the management and disposal of drilling muds and slurries.

All Other Facilities (MPWSP Desalination Plant, Carmel Valley Pump Station, and All Pipelines)

The proposed pipelines would be built along the TAMC right-of-way, Monterey Peninsula Recreational Trail, and existing road rights-of-way. The Carmel Valley Pump Station would be built on an existing concrete pad. These facilities do not require construction activities within groundwater-bearing zones and thus would have a very low potential to degrade groundwater quality. While pipeline trenches may encounter shallow groundwater, the construction operation of laying a pipeline and backfilling the trench would not release contaminants into the shallow groundwater zone. This impact would be less than significant.

Impact Conclusion

Impacts associated with discharges to groundwater and impacts on groundwater quality during the construction of project facilities would be less than significant.

Mitigation Measures

None proposed.

4.4.5.2 Operations and Facility Siting Impacts

Impact 4.4-3: Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level during operations. (*Less than Significant*)

Impact 4.4-3 evaluates the potential effects of extracting and injecting groundwater as proposed by the MPWSP. This impact analysis addresses the following:

- Changes in available supply in the SVGB from groundwater pumping at CEMEX,
- Effect of groundwater extraction at the CEMEX site on nearby groundwater supply wells,
- Effect of injection and extraction through ASR wells on the SGB, and
- Changes in aquifer recharge in SVGB.

Impact on Groundwater Supply in the SVGB

Please see Section 4.4.4, Approach to Analysis, for additional information on modeling, methodology and terms used in this analysis.

This analysis evaluates the extraction and return water components of the proposed project to determine their physical effects on the SVGB and determines whether the changes, if any, constitute a significant impact. The NMGWM^{2016} was the primary tool used to evaluate the effects on the basin and its aquifers and is discussed in more detail in Section 4.4.4, Approach to Analysis, and in **Appendix E2**. The significance criterion states that an impact would occur if extraction from the subsurface slant wells substantially depleted groundwater in the SVGB such that there would be a net deficit in aquifer volume. As described in Section 4.4.3, a substantial net deficit in aquifer volume, for the purposes of this analysis, refers to the removal of groundwater from the aquifer at a rate that exceeds natural recharge such that: 1) groundwater levels are permanently lowered and could not recover to pre-project conditions; 2)production well yields in neighboring active wells decline to such a degree that other groundwater users in the basin experience an intolerable decrease in available groundwater supply, or; 3) the lowering of groundwater results in subsidence and compaction that reduces the available volume of groundwater storage.

First, in order to conservatively judge potential impacts, this analysis determined the pumping scenario that would have the most profound aquifer response from the proposed slant well pumping at the CEMEX site. Extracting groundwater from slant wells at the CEMEX site could cause an aquifer response up to 4 miles inland. **Figure 4.4-13a** shows the cone of depression with -1, -5, -10, and -20-foot contours showing change in groundwater level and the extent of pumping influence in the 180-FTE Aquifer; these drawdowns would stabilize within five years after pumping begins, and would remain stable as long as the MPWSP is pumping. This model scenario assumes that no water would be returned to the SVGB and the sea level would be consistent with current levels. This scenario generates the most pronounced cone of depression with the largest area of influence because groundwater would not be returned to the basin, and because current sea level would not increase groundwater levels and gradients at the coast as it is expected to do in the next 63 years. This scenario was used to represent the maximum area of pumping influence, as shown in **Figure 4.4-13a**.

The second step in this analysis was to use the contour map showing the projected change in drawdown on **Figures 4.4-13a** and the extent of the projected capture zone **4.4-13b** to determine the area of influence, maximum drawdown, and area of capture created by the slant well pumping. The capture zone on **Figure 4.4-13b** is overlaid on the same cone of depression depicted on **Figure 4.4-13a** and represents the capture zone created with a regional gradient of 0.0007.[32]

As shown by the projected area of pumping influence on **Figures 4.4-13a** and **4.4-13b**, the orientation of the cone of depression and the slant well capture zone indicate that the majority of the groundwater drawn into the proposed MPWSP slant wells would originate in the aquifer zones located at and slightly offshore of the coast and would likely be composed primarily of highly brackish ambient groundwater present in the aquifer materials and seawater. The western extent of the cone of depression is just offshore and near the slant wells where the drawdown would be deepest and contours steeper, indicating more flow to the slant wells and higher yield near the coast. This coincides with the shape of the capture zone. At the coast, seawater entering the slant wells would have the shortest and least restricted pathway through the overlying seafloor deposits.

The relationship between the cone of depression and the capture zone is shown graphically on **Figure 4.4-13c**, which provides a cross-sectional illustration of the Pre-Project and Project water levels, drawdown, and capture zone. The "Pre-Project" Condition (shown at the top of **Figure 4.4-13c**) depicts groundwater flowing inland from the coast at a gradient of 0.0005[33] and represents the groundwater condition in the 180-FTE Aquifer. The "Project Condition" represents how the groundwater would respond to slant well pumping in the 180/180-FTE Aquifer, assuming 2012 sea level and no return water, and is correlative to the map view of the cone of depression shown on **Figures 4.4-13a** and **4.4-13b**.[34] As illustrated by Figure 4.4-13b, when the

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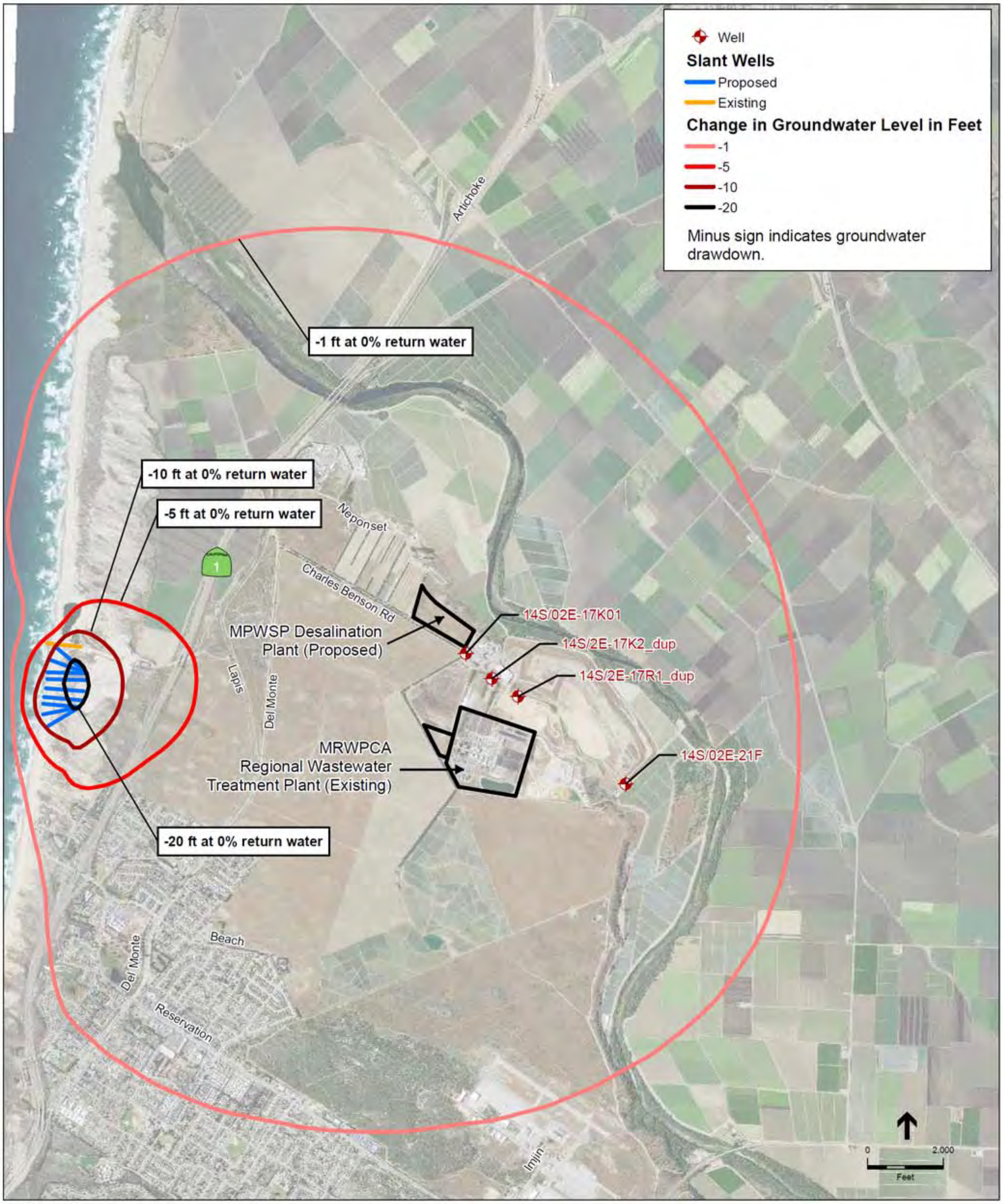
32 A 0.0007 regional gradient is considered more representative of the minimum gradient based on local conditions. and is used herein for purpose of demonstration. The actual capture zone may be smaller with a higher steeper gradient.

33 The gradient of 0.0005 is used in Figure 4.4-13c as a representative gradient for the purposes of demonstration.

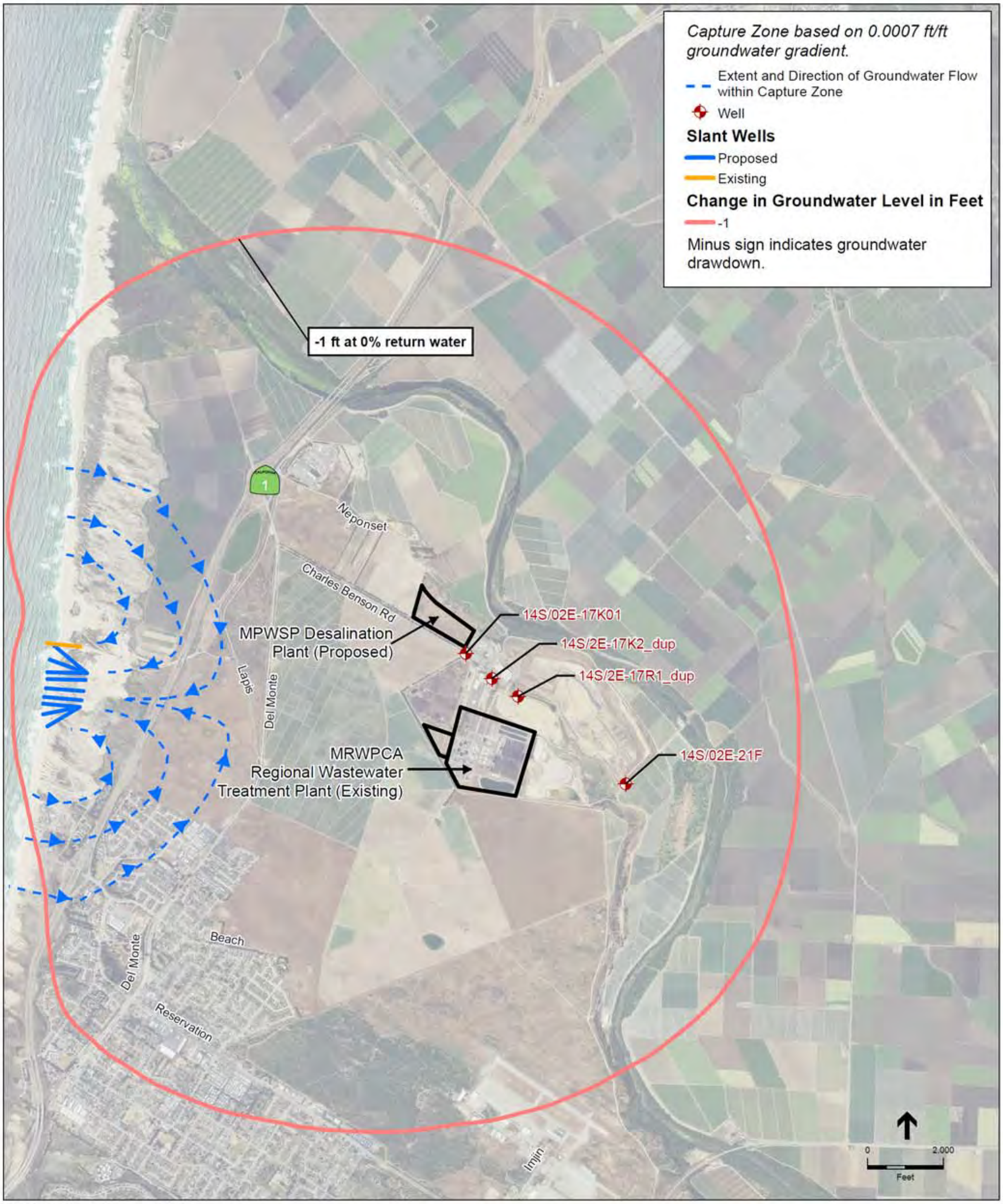
34 It should be noted that the vertical scale in the cross section is considerably exaggerated in the "Project Condition" to clearly illustrate the relationship between the cone of depression and the capture zone; for reference, the NMGWM[2016] projected that the maximum drawdown amount under this pumping scenario was about 29 feet at the slant wells.



SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.4-13a
Proposed Project: Response of 180-Foot Aquifer after 63 Years
0% Return Water



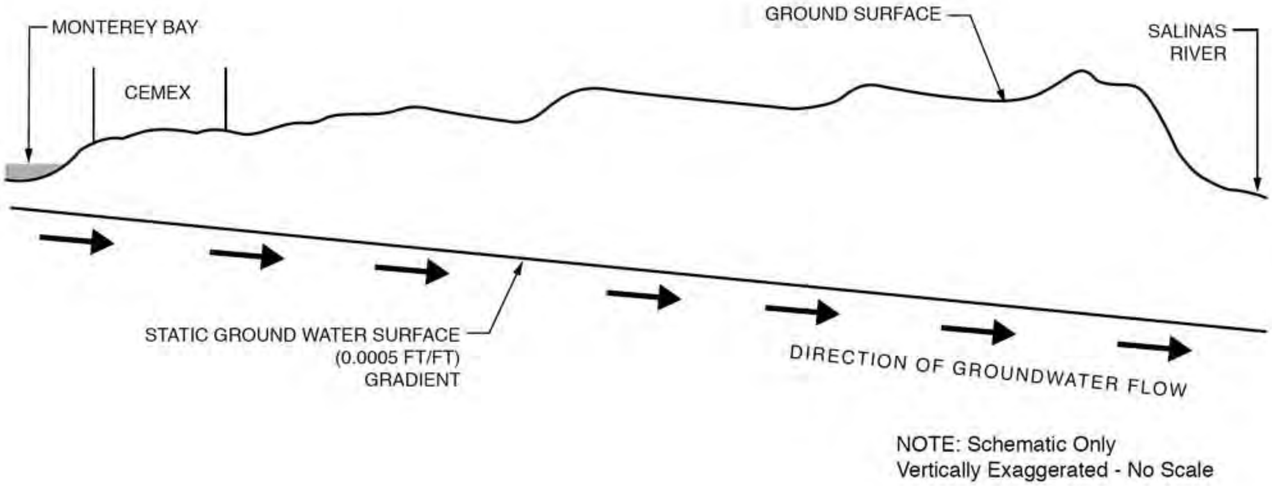
SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

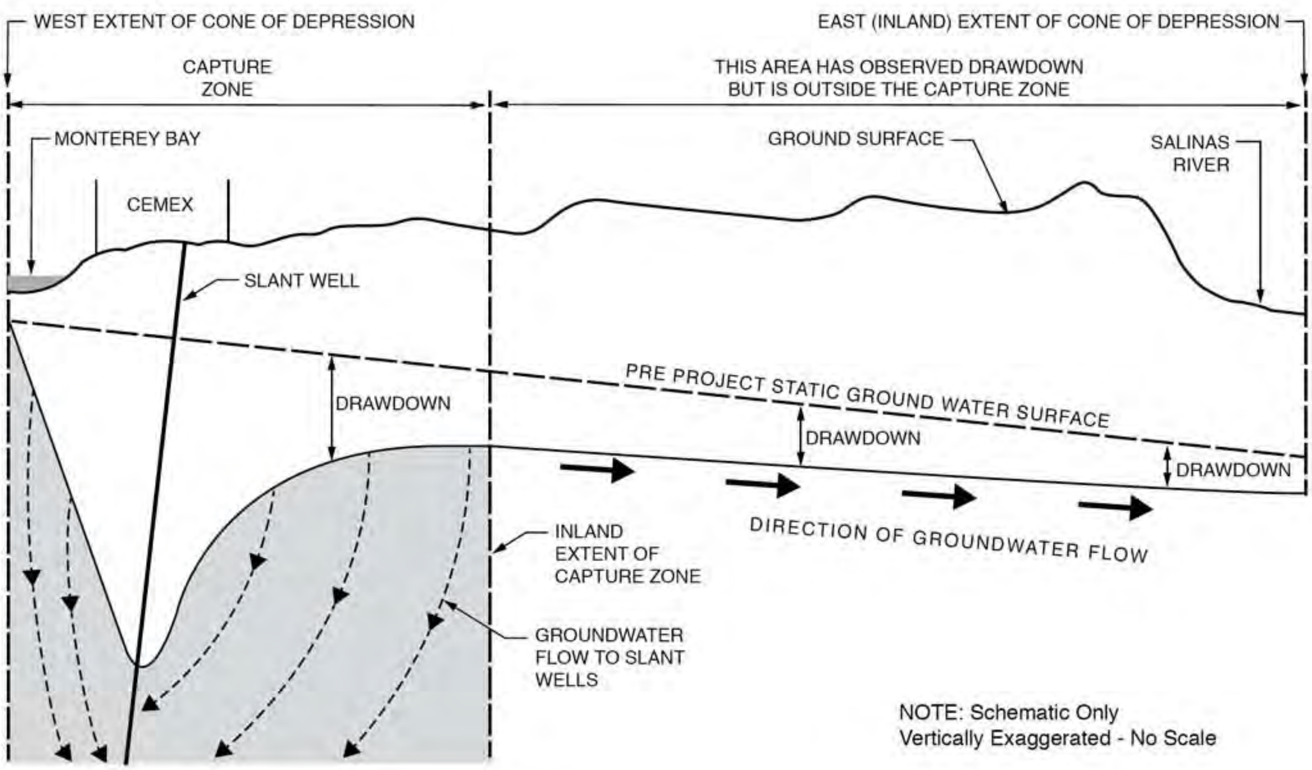
Figure 4.4-13b

Extent of Capture Zone and -1-Foot Contour of Cone of Depression
180-Foot Aquifer After 63 Years
0% Return Water

PRE PROJECT CONDITION



PROJECT CONDITION



SOURCE: ESA

205335.01 Monterey Peninsula Water Supply Project

Figure 4.4-13c
Schematic Showing Relationship Between Cone of Depression and Capture Zone

slant wells are pumping, water within the capture zone would be drawn into the wells from the surrounding sediments. The groundwater responds by creating a cone of depression, which would be most pronounced near the slant wells and would decrease and become shallower as the cone of depression extends eastward. The inland extent of the capture zone (shown by a vertical dashed line) is the point that could be described as a groundwater gradient divide: groundwater west of the divide is drawn into the capture zone by the slant wells and thus flows west, while the groundwater to the east of the divide continues to flow inland unimpeded under the regional gradient.

The third step in this analysis was to assess the quality and current use of the groundwater that would be extracted by the slant wells. As described in subsection 4.4.1.4, above, groundwater monitoring in wells from the coast inland about 8 miles in the 180-Foot Aquifer and 400-Foot Aquifer have shown evidence of legacy and ongoing seawater intrusion for decades. Currently, there are no groundwater supply wells drawing potable groundwater supplies from the Dune Sand Aquifer because of its overall limited extent. The MPWSP slant wells would not extract potable groundwater. Groundwater in the Dune Sand and 180-FTE Aquifers within the projected MPWSP slant well capture zone is highly brackish to saline, far exceeding the State Drinking Water Standard of 500 mg/L of TDS. This is the water that would become the source water for the proposed MPWSP slant wells. Other than at CEMEX, there are no groundwater supply wells or groundwater users of this highly intruded groundwater. Water quality in the capture zone is well represented by the CalAm monitoring well clusters MW-1, MW-3, and MW-4 and Test Slant Well results. Groundwater samples collected in monitoring wells in February 2015 indicate TDS concentrations ranging between 23,400 mg/L (MW-3S) to 30,900 mg/L (MW-1M) and chloride concentrations ranging between 11,680 mg/L and (MW-3S) and 16,037 mg/L. The concentrations also far exceed the 3,000 mg/L TDS threshold that SWRCB Resolution No. 88-63 (Appendix A-9 of the Basin Plan for the Central Coastal Basin) uses to determine whether groundwater is suitable, or potentially suitable, for municipal or domestic water supply (SWRCB, 2015). Recent testing for TDS in groundwater within the projected capture zone verifies the degree of seawater intrusion and these data show that groundwater within the projected capture zone of the proposed MWSP slant wells is highly brackish with elevated TDS attributable to seawater intrusion.

Current groundwater production in the Dune Sand Aquifer and the 180-FTE Aquifer at the CEMEX site and within the model-projected area of influence from MPWSP pumping is limited to minor irrigation and dust control. There are no water supply wells pumping potable water. Most of the wells in the coastal area are no longer active because of seawater intrusion. Furthermore, groundwater production is restricted within the seawater intruded coastal areas in the vicinity of the CEMEX site through MCWRA Ordinance 3709, which prohibits drilling wells and pumping groundwater from certain areas within the 180-FTE Aquifer in order to protect groundwater resources. While the proposed slant wells would not be located within the boundaries of Ordinance 3709, a portion of the area of pumping influence east of CEMEX is within the jurisdictional boundary of Ordinance 3709.

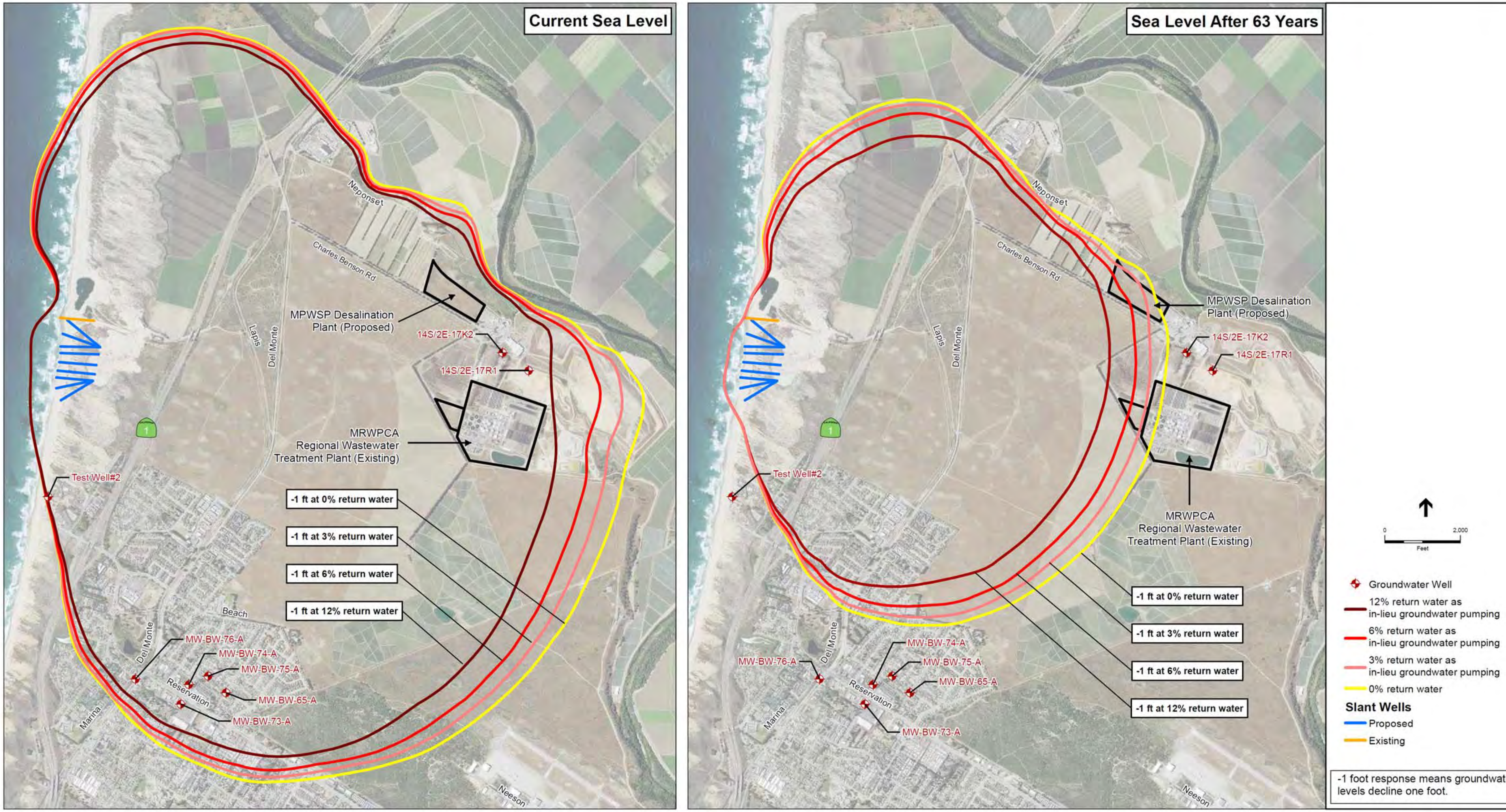
Conclusions of Impact Analysis – Depletion of Groundwater Supply from the SVGB

The proposed project would not deplete groundwater supplies in the Dune Sand, the180-FTE Aquifer, the 400-Foot Aquifer or the Deeper Aquifer; it would extract primarily seawater and a smaller volume of highly brackish ambient groundwater from a localized coastal capture area with only minor localized groundwater drawdown (1 to 5 feet) extending up to 4 miles inland. As the slant wells and the capture zone they create are located at the coast, seawater would be the primary source of recharge, and the regional inland gradient would preclude inland groundwater in the Dune Sand Aquifer and 180-Foot Aquifer from being drawn to the capture zone. The capture zone created by MPWSP groundwater pumping is within an area that has been degraded by seawater intrusion and therefore unusable for potable water supply due to its high salinity. When desalinated water is returned to the basin as part of the MPWSP, groundwater conditions in the 400-Foot Aquifer underlying the CSIP, CCSD, and adjacent areas would improve as water levels increase from in-lieu groundwater recharge. The return water component of the MPWSP would benefit each of the aquifers by either reducing the area of influence or by increasing groundwater levels in other areas. The effects of return water on the basin water levels are discussed below and shown on **Figures 4.4-14** through **4.4-16**. If the proposed project did not return any water, localized depressed groundwater levels would likely persist in the three affected aquifers throughout the life of the project. However, the area affected by groundwater pumping would remain localized and the MPWSP would continue to extract only highly brackish groundwater and seawater from the coast.

The MPWSP would not deplete groundwater supply from the SVGB or result in a substantial net deficit in aquifer volume of the Dune Sands or 180-FTE Aquifer because the slant well capture zone would be supplied by an unlimited source of recharge from the Monterey Bay that would replace the highly brackish ambient groundwater with seawater. At this rate of recharge, groundwater levels would be drawn down but would reach equilibrium (steady state) and are projected to increase over time, reducing the extent of the cone of depression, with sea level rise. The MPWSP slant wells would not draw groundwater from beyond the eastern extent of the capture zone in the Dune Sand or 180-FTE Aquifers so, other than a minor drawdown ranging between 1 and 5 feet up to 4 miles inland that would affect only a few active non-potable production wells, the water supplies of other basin users would not be intercepted, depleted, or degraded. The underlying geology (Terrace deposits) and the degree of projected drawdown would not be sufficient to trigger permanent subsidence or compaction and the eventual loss of aquifer volume. In addition, the calculated fraction of groundwater in the MPWSP source water would be returned to the basin as in-lieu recharge and, therefore, the water provided to the CalAm service area would have originated from the ocean. This return water function would essentially put the SVGB in a “no net loss” position in terms of fresh water quantity and would benefit legal water users by providing fresh water for beneficial use in lieu of SVGB pumping. Based on the conclusions of this analysis, this impact would be less than significant.

Impact on Nearby Production Wells

An impact would be considered significant if the proposed project were to lower groundwater levels in a nearby municipal or private groundwater production well enough to cause a substantial reduction in well yield, or to cause physical damage due to exposure of well screens and well pumps. The nearby production wells that could be affected by MPWSP pumping at the CEMEX site are shown on **Figure 4.4-14** and listed in **Table 4.4-10**.

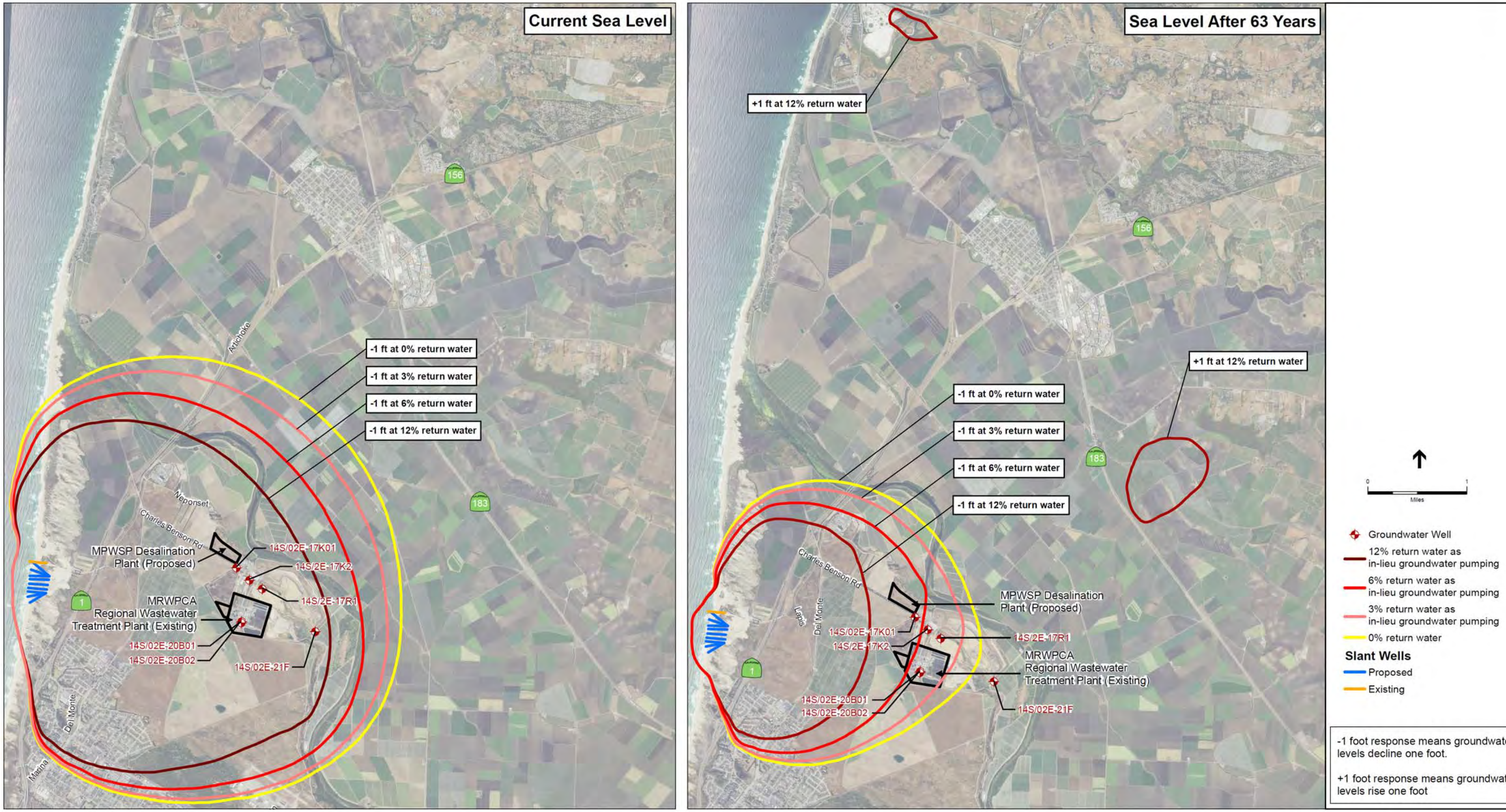


SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.4-14

Proposed Project: 1-Foot Response in Dune Sand Aquifer

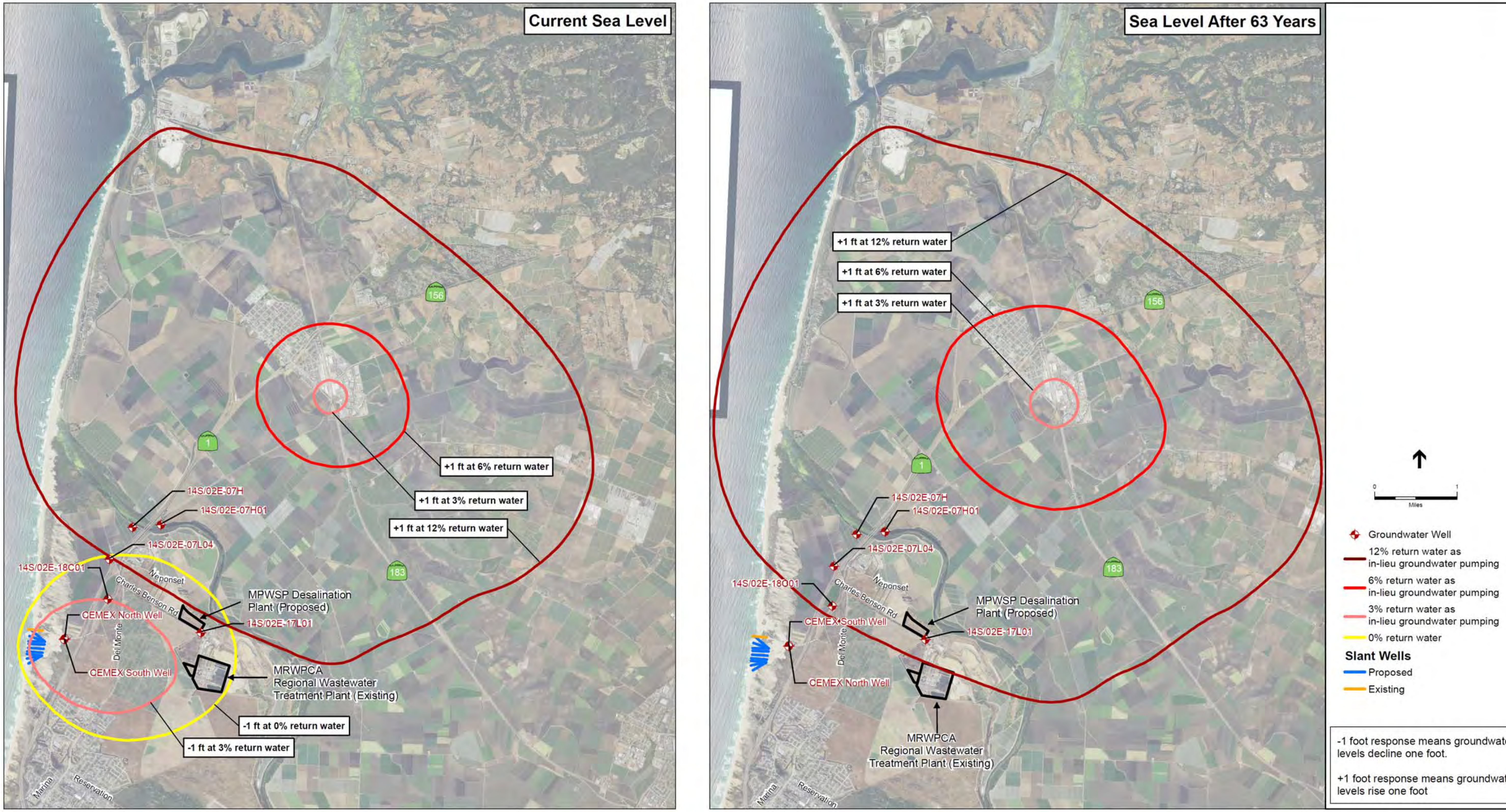


SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.4-15

Proposed Project: 1-Foot Response in 180-Foot Aquifer



SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.4-16
Proposed Project: 1-Foot Response in 400-Foot Aquifer

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**TABLE 4.4-10
KNOWN ACTIVE SUPPLY WELLS WITHIN VICINITY
OF THE PROPOSED MPWSP SLANT WELLS**

Well Owner	Well Number/ID	Aquifer	Use Status
CEMEX	South Well North Well	400	South Well is located about 1,600 feet southeast of the insertion point of the proposed slant wells. The well screen is set between 400 and 506 feet and is separated from the intake portion of the slant wells by the 180/400-Foot Aquitard. CEMEX North collapsed and is unusable.
Ag Land Trust	14S/02E-18C01	400	“Small Well” (14S/2E-18C1) is located between Lapis Road and east of Highway 1 and is used to supply a water truck filling station for dust control.
	14S/02E-18E01	900	“Big Well” (14S/02E-18E01) is located adjacent to the west side of Highway 1, north of the access road to the CEMEX property. The Big Well has no pump, but is reportedly occasionally hand-bailed for irrigation on local restoration projects.
MRWPCA Regional Wastewater Treatment Plant	14S/02E-20B01	180	Three wells are located just southeast of the proposed MPWSP Desalination Plant, but only the well screened across the Deeper Aquifer is active and is used for domestic purposes (i.e., drinking water, washing, toilets).
	14S/02E-20B02	180	
	14S/02E-20B03	900	
Monterey Peninsula Landfill	14S/02E-17K01	180	Located adjacent to and southeast of the proposed desalination plant site on Charles Benson Road. Four wells are screened across the Dune Sand Aquifer and/or the 180-FTE Aquifer. Three of the water supply wells are used for dust control; the fourth well is inactive.
	14S/02E-17K02	DSA and 180	
	14S/02E-17R01	DSA and 180	
	14S/02E-21F	180	
Bill Baillee/Unknown	14S/02E-07H	400	Two local private wells owned by Bill Baillee (14S/02E-07H and 14S/02E-07H01) and two with unknown owners (14S/02E-17L01 and 14S/02E-07L04). These wells are screened across the 400-Foot Aquifer.
	14S/02E-07H01	400	
	14S/02E-17L01	400	
	14S/02E-07L04	400	
Municipal Wells			Municipal wells are mentioned here, but they are not shown on figures because the City of Marina’s Wells 10, 11, and 12 are over 2 miles to the southeast outside of the capture zone, and are screened in the Deeper Aquifer (MCWD, 2005). The Ord Community Wells 29, 30, and 31 are located 5 plus miles to the southeast and are screened in the lower 180-Foot and the 400-Foot Aquifers (MCWD, 2005)

NOTES:

MRWPCA = Monterey Regional Water Pollution Control Agency
DSA = Dune Sand Aquifer
180 = 180-FTE Aquifer or 180-Foot Aquifer
400 = 400-Foot Aquifer
900 = Deeper Aquifer

SOURCE: Geoscience, 2015c; MRWMD, 2003.

This impact analysis presents and discusses the NMGWM^{2016} model output that were used to project the aquifer response to the proposed MPWSP extraction of groundwater at the CEMEX site. These model outputs are used to assess the impacts on the nearby, active groundwater supply wells located within an area extending about 4 miles inland from the CEMEX site.

The aquifer response to the proposed project is shown for the Dune Sand Aquifer, (**Figure 4.4-14**), the 180-FTE Aquifer (**Figure 4.4-15**), and the 400-Foot Aquifer (**Figure 4.4-16**). As shown in Figures 5.3a-b and 5.4a-b of Appendix E.2, the NMGWM^{2016} calculated no drawdown in Model Layer 8 (the Deeper Aquifers or "900-Foot Aquifer") from the 9.6 mgd (proposed project) pumping scenario at CEMEX. The NMGWM^{2016} did not project an aquifer response from MPWSP pumping in the deeper aquifers, (often referred to as the 900-Foot Aquifer) underlying the 400/900 Foot Aquitard. These figures also show the local nearby water supply wells described in **Table 4.4-10** but locate only those supply wells that are screened in the specified aquifer. For instance, only wells screened in the 180-FTE Aquifer are shown on **Figure 4.4-15**. Each figure also provides a side-by-side comparison of the aquifer response at current sea level in Model Year 1 and the predicted sea level in Model Year 63.

The extent of aquifer response is shown using the -1-foot groundwater contour. This contour was chosen to delimit the minimum regional response of MPWSP pumping. Groundwater levels inside the -1-foot contour would have a groundwater drawdown greater than 1 foot. **Figure 4.4-13a** shows where the -1, -5, -10, and -20-foot drawdown contours would be inside the cone of depression formed under the pumping scenario with the greatest magnitude of aquifer response (0 percent return water under current sea level conditions). **Figures 4.4-14** through **4.4-16** show the -1-foot contour under the 0, 3, 6, and 12 percent return water scenarios.

Groundwater modelers used these return water percentages to capture minimum, maximum, and mid-range estimates of return water volumes. The amount of return water is expected to range between 0 percent and 12 percent. A 0 percent return volume would mean the MPWSP would extract water but not return water to the basin as in-lieu recharge. This would depict the condition that causes the greatest projected magnitude of aquifer response from MPWSP pumping.

Results of Impact Analysis - Proposed Project on Nearby Production Wells

Observations of Pumping Response Applicable to all Aquifers

The maximum projected pumping response in all three aquifers is depicted by the -1-foot contour at 0 percent return water, under current sea level rise conditions. The -1-foot contours resulting from 3, 6 and 12 percent return water consistently show an aquifer response less than that resulting from the 0 percent return water scenario. The area of pumping influence would be less pronounced under the sea level rise conditions expected after 63 years of operation because higher sea levels exert greater pressures at the coast, making more seawater available to the slant wells. Consequently, groundwater levels may decrease in a well when the MPWSP starts pumping, but could increase as the cone of depression decreases over the 63 years of operation.

Aquifer Response in Dune Sand Aquifer

The Dune Sand Aquifer response from MPWSP pumping, with current sea level conditions and 0 percent return water, would extend a maximum of about 3 miles inland from the CEMEX site (**Figure 4.4-14**). Under sea level conditions after 63 years, the area of influence would be reduced in size by about a mile. Monterey Peninsula Landfill wells 14S/2R-17K2 and 14S/2R-17R1 are screened in the Dune Sand Aquifer. It is important to note that the NMGWM[2016] considers the Dune Sand Aquifer, the Salinas Valley A Aquifer, and the -2-Foot Aquifer, plus the hydraulically disconnected perched, mounded aquifers at the Monterey Peninsula Landfill and the Fort Ord “A” Aquifer (occurring 1.5 miles inland) as one connected aquifer. However, this is not the actual hydrogeologic condition and therefore, there would be no impacts on the perched, mounded aquifers because they are above the Dune Sands Aquifer.

Aquifer Response in 180-FTE Aquifer

The greatest observed groundwater response to MPWSP pumping would be in the 180-FTE Aquifer under the current sea level conditions (**Figure 4.4-15**). The -1-foot contour resulting from the 0 percent return water scenario would extend a maximum distance of about 3.6 miles to the northeast. With sea level rise after 63 years, the aquifer response for all three return water scenarios would be reduced by about a mile. Under the 12 percent return water scenario, two localized areas of groundwater level increase would develop: one would be located 5 miles to the northeast, near Highway 183, and one would develop about 6.5 miles north, near Dolan Road in Moss Landing. Two small circular +1-foot contours indicate an increase in the groundwater level of 1 foot or more. This increase represents the effects of 12 percent return water, with the corresponding reduced pumping in the 400-Foot Aquifer underlying CSIP and CCSD.[35] Monterey Peninsula Landfill wells 14S/2R-17K01, 14S/2R-K02, 14S/2R-17R1, and 14S/2R-21F are screened in the 180-FTE Aquifer.

Aquifer Response in the 400-Foot Aquifer

Under the 0 percent return water scenario and current sea level conditions, the aquifer response would extend inland about 2.5 miles from the CEMEX site (**Figure 4.4-16**). Aquifer response with 3 percent return water and the current sea level would produce two conditions in the 400-Foot Aquifer: an area of pumping response extending inland from CEMEX about 1.8 miles, and an area of localized groundwater level increase near the CCSD. Under a 6 percent return water scenario, and under the current sea level conditions, the only aquifer response would be a groundwater level rise encompassing the CCSD and portions of the CSIP delivery area near Castroville. This change would be a likely result of CCSD reducing groundwater pumping because it would be receiving desalinated return water. With 12 percent return water and at current sea level rise, the groundwater levels in the 400-Foot Aquifer could increase by at least 1 foot north of the Salinas River, including the CCSD and CSIP areas, and areas east of Highway 183.

[35] The two isolated areas of increased groundwater levels in the 180-Foot Aquifer (sea level rise conditions after 63 years) are in response to decreased pumping from the 400-Foot Aquifer. The pumping reduction allows water to recover in the 400-Foot Aquifer, and as a result, the difference between water levels in the 180-Foot Aquifer and 400-Foot Aquifer decrease. The model results indicate, therefore, that water levels in the 180-Foot Aquifer will be greater than if pumping from the 400-Foot Aquifer continued.

The aquifer response with 0 percent return water and sea level conditions after 63 years could result in no aquifer response in the 400-Foot Aquifer. This is because higher sea level would provide more pressure at the coast and available seawater to the slant wells, which reduces the differences between water levels in the 180-Foot Aquifer and 400-Foot Aquifer. With 3, 6, and 12 percent return water and sea level rise after 63 years, the aquifer response would be similar to current sea level conditions, resulting in increased water levels extending out from the city of Castroville for about 3 to 4 miles in all directions. The CEMEX South Well, the Ag Land Trust Well (14S/02E-18C01), the MRWPCA Regional Wastewater Treatment Plant wells (14S/02E-20B01, 14S/02E-20B02), and the Bill Baillee/unknown wells (14S/02E-07H01, 14S/02E-07H, 14S/02E-07L01, and 14S/02E-07L04) are screened in the 400-Foot Aquifer.

Aquifer Response in the Deeper Aquifers

As shown in Figures 5.3a-b and 5.4a-b of Appendix E.2, the NMGWM^{2016} calculated no drawdown in Model Layer 8 (the Deeper Aquifers or “900-Foot Aquifer”) from the 9.6 mgd (proposed project) pumping scenario at CEMEX (nor for reduced pumping scenarios or pumping at Potrero Road, associated with Alternatives 1, 5a, and 5b; see Section 5.5.4 and Appendix E2, Figures 5.9a-b and 5.10a-b). Therefore, it was concluded that the proposed slant well pumping at CEMEX would not influence groundwater levels in the deeper aquifers and there would be no direct groundwater drawdown impact from the MPWSP on the deeper aquifers.

As the deeper aquifers could rely on leakage from overlying aquifers, effects on these aquifers from slant well pumping in the 400-Foot Aquifer requires consideration. Based on the impact discussion for the 400-Foot Aquifer presented above, the proposed slant well pumping could cause a localized response in the 400-Foot Aquifer under current sea level conditions with 0 and 3 percent return water. The 6 and 12 percent return water scenarios would not draw water levels down in the 400-Foot Aquifer but would increase groundwater levels near CCSD and Castroville and east of Highway 183. Therefore, the pumping effect on the 400-Foot Aquifer under the 0 and 3 percent return water scenarios would not affect recharge to the deeper aquifers because the area of influence (the model-calculated cone of depression) would occur in an area where production wells are not actively pumping from the deeper aquifers. Under the 6 and 12 percent return water scenarios, groundwater levels could increase in the 400-Foot Aquifer, possibly increasing potential recharge to the deeper aquifers. Additionally, the projected groundwater drawdown effects in the 400-foot Aquifer from the MPWSP would not extend south to Marina, so it would not directly influence leakage recharge to the portions of the deeper aquifers currently pumped by MCWD production wells.

Depth of Well Screens in 180-FTE Aquifer and 400-Foot Aquifer

There are no active production wells extracting groundwater from the Dune Sand or 180-FTE Aquifers within the boundaries of the area projected as the MPWSP capture zone. There are no public or private wells completed in the Dune Sand Aquifer within the projected area of influence of MPWSP pumping. **Table 4.4-10** lists those wells that are within the area of influence (cone of depression) created by the proposed MPWSP slant well pumping and that could experience between 1 and 5 feet of drawdown because of the MPWSP pumping. These wells would be completed in the Dune Sand and 180-FTE Aquifer. Based on available well construction logs of private and Monterey Peninsula Landfill supply wells, and information from the CalAm groundwater monitoring data, screen intervals of wells completed in the 180-FTE Aquifer range between 150 and 250 feet below the ground surface. For example, the well screen interval in Monterey Peninsula Landfill well 14S/02E-17K01, completed in the 180-FTE Aquifer, was placed between the depth interval of 210 to 250 feet and the water level in fall 2016 was about 95.0 feet below ground surface. The groundwater surface in this well, therefore, is 115 feet above the top of the well screen. The top of the well screen in the Bill Baillee well (14S02E-17L01), which is screened in the 400-Foot Aquifer, is 133 feet below the groundwater surface. Water levels in the 180-FTE Aquifer can range from 50 to 100 feet below ground surface in the area influenced by the MPWSP slant well pumping. In most cases, therefore, the well screens in these local supply wells are at least 100 feet below the groundwater surface in the well.

The MCWRA compiles annual regional groundwater level data on a quarterly basis for the SVGB including the Pressure 180-Foot Aquifer and Pressure 400-Foot Aquifer and compares the data to a representative dry water year and the 30-year average (MCWRA, 2018a). According to MCWRA water level data, the 30-year average (1987 to 2017) groundwater levels in the Pressure 180-Foot Aquifer fluctuate seasonally about 17 feet: from about 22 feet above mean sea level (amsl) in the winter months to 5 feet amsl in the summer. The lowest seasonal average water levels are recorded during drought years where, seasonally, the maximum seasonal fluctuation can be similar to the 30-year average (about 17 feet) but the groundwater levels drop about 10 feet overall, as was the case during the peak of the 2015 drought when the groundwater levels reached an annual low of about 6 feet below mean sea level. The groundwater level trends are similar in the pressure 400-Foot Aquifer where the annual seasonal fluctuation is about 20 feet between: 7 feet amsl in the winter months to 17 feet below mean sea level in the summer. The drought year groundwater level fluctuation was similar to the 30-year average (about 22 feet) but the groundwater levels dropped about 7 feet in the dry water year of 2015.

The projected drawdown of 1 to 5 feet in the neighboring wells from MPWSP slant well pumping would not draw water in the well close to the top of the screen. The potential that the increment of drawdown attributable to the MPWSP pumping would result in reduced well yield, exposure of well screens, or well damage during a drought year or as a result of other pumping stresses in the SVGB is low because the height of the groundwater over the screen is adequate to accommodate the tens of feet of annual water level changes due to seasonal fluctuations, agricultural pumping in normal water years, reduced recharge in drought periods, and additional drought-period pumping.

Impact Conclusion – Impact of Proposed Project on Nearby Production Wells

This analysis demonstrated that certain groundwater supply wells located within the slant well area of influence could experience a change in groundwater level between 1 and 5 feet during the life of the project.

The NMGWM^{2016} considered the effects of the project with and without returning water to the SVGB. The more profound groundwater level declines would occur under the 0 percent return water scenario because, under the 0 percent return water scenario, no water would be returned to the CCSD or CSIP for in-lieu groundwater recharge and pumping in the 400-Foot Aquifer would not be reduced. However, if 3 to 12 percent return water is supplied as in-lieu groundwater recharge, there would be less of a response to MPWSP pumping in the Dune Sand Aquifer, the 180-FTE Aquifer, and the 400-Foot Aquifer. Increased sea level rise over the next 63 years would additionally reduce the area influenced by MPWSP pumping.

The nearby groundwater production wells affected by the change in groundwater levels are constructed in the 180-FTE Aquifer or the 400-Foot Aquifer and thus have casings, pumps, and screens at depths considerably deeper than the water table. Therefore 1 to 5 feet of drawdown due to MPWSP pumping would not lower water levels below the top of the well screens. A water level decline between 1 and 5 feet would not expose screens, cause damage, or reduce yield in the groundwater supply wells influenced by MPWSP pumping. Based on the modeled response of the 24.1 mgd extraction rate at the CEMEX site, the impact on nearby water supply wells would be less than significant.

Applicant-Proposed Measure

CalAm recognizes the long-term nature of the proposed project and the need to provide continued verification that the project would not contribute to lower groundwater levels in nearby wells within the SVGB. So, as part of the project, CalAm proposes to fund the expansion of the existing regional groundwater monitoring program to include the area where groundwater elevations are anticipated to decrease by one foot or more in the Dune Sand Aquifer, the 180-FTE Aquifer and the 400-Foot Aquifer. This constitutes an Applicant-Proposed Measure that is presented and evaluated at the end of **Impact 4.4-3**.

Impacts of ASR Injection/Extraction Wells

The volume of treated desalinated water routed to the ASR system would depend on precipitation and the water supply demands in any given year, but is expected to be about 2,100 afy. The injection of this additional water into the confined Santa Margarita Sandstone could create short-term groundwater mounding, which can cause localized changes in groundwater levels and flow. A significant impact could occur if operation of the proposed ASR injection/extraction wells resulted in groundwater mounding, change in groundwater gradients, or lower groundwater levels such that nearby municipal or private groundwater production wells were to experience a substantial reduction in well yield or physical damage due to exposure of well pumps or screens.

The MPWMD’s ASR EIR (2006) analyzed the impacts on groundwater storage and water levels in the SGB. The analysis presented a pilot study and a groundwater model to evaluate the impacts on groundwater storage in the SGB through operation of the ASR program. The analysis determined that up to 2,426 afy could be injected through the implementation of the ASR program, of which up to 2,003 afy would be extracted. The findings of the analysis concluded that injecting excess treated Carmel River water into the ASR injection/extraction wells was beneficial to groundwater storage within the SGB, so long as extraction did not exceed injection on an annual basis.

Since the MPWMD’s ASR project was approved with injection beginning in 2001, 2 afy to 1,117 afy of excess Carmel River have been injected into and extracted from storage for a total of about 4,175 af through 2013 (Pueblo Water Resources, 2014). Although, due to lack of precipitation and constraints in the existing CalAm transmission system, the program has not achieved 2,426 afy, the annual volume of water evaluated in the ASR EIR, the groundwater monitoring results indicate that the injection and extraction of water does not adversely affect groundwater storage in the SGB. However, the MPWMD ASR program can only divert winter flows from the Carmel River that are in excess of in-river needs, and is therefore rainfall dependent. Furthermore, the program does not increase storage in the SGB, since the injected Carmel River water is subsequently pumped back out to reduce CalAm's pumping from the Carmel River and the SGB.

The proposed project would include the installation of two additional ASR injection/extraction wells to increase the reliability of the ASR program to inject and extract Carmel River water, and to allow for the injection and ultimate extraction of treated desalinated water. However, the injection and extraction volumes of water from the desalination plant would be managed such that there would be no net negative change to the storage of groundwater on an annual basis. That is, the volume of water in storage would not be allowed to decrease due to extraction. Water injected in a particular year but not used in that same year could be stored for the next year.

In addition, CalAm must return to the basin 700 afy of water for the next 25 years to mitigate its overdraft of the SGB (Seaside Groundwater Basin Watermaster, 2012b). To accomplish this water exchange, CalAm would extract only 774 afy of its 1,474 afy SGB adjudicated allocation. The payback of 700 afy for 25 years would result in the retention of 17,500 afy in storage, reducing the historical overdraft of the SGB and increasing groundwater levels.

Impact Conclusion – Operation of the ASR Injection/Extraction Wells

Injection and extraction would be managed so that the water provided from the desalination plant would not constitute a net negative change in storage. Because the storage in the aquifer would increase by 700 afy for the first 25 years and then remain constant thereafter, impacts related to mounding, change in groundwater flow directions and excessive extraction would not occur and the impact would be less than significant.

Impacts on Groundwater Recharge

The MPWSP could interfere with groundwater recharge by decreasing groundwater elevations from groundwater pumping, thereby disrupting the existing surface water–groundwater interaction on the Salinas River or creating additional impervious surfaces through the construction of project facilities. Impervious surfaces reduce the volume of rainwater that infiltrates down to the aquifer. A significant impact would occur if the proposed project causes a net deficit in aquifer volume or lowers the local groundwater table level so as to interfere substantially with groundwater recharge. The proposed project's contribution to alteration of the surface water-groundwater interaction and the increase in impervious surfaces is discussed below.

Impacts of the Project on the Surface Water-Groundwater Interaction at the Salinas River

As a river flows over the land surface, it may lose water to the subsurface or gain water by intersecting groundwater from the underlying water table,[36] depending on the depth to

[36] The water table is the surface of the shallowest aquifer that is unconfined and open to the overlying atmosphere. In this case, the groundwater surface of the Dune Sand Aquifer or the inland Perched A Aquifer would be the water table.

groundwater relative to the level of the riverbed. This surface water-groundwater interaction causes groundwater to discharge to streams in some areas and causes surface water to infiltrate to the subsurface aquifers in others. When a river gains groundwater from the aquifer, that is called a gaining stream; when it loses groundwater to the aquifer, it is called a losing stream. In the case of the MPWSP, the portion of the Salinas River within the area of influence from the slant well pumping is a gaining stream. Consequently, the slant well pumping could draw in brackish groundwater that would otherwise discharge to the river. It is unlikely that the proposed project would directly pull surface water from the Salinas River.

The NMGWM^{2016} can estimate the loss of groundwater outflow to a surface water feature such as the Salinas River. Based on the modeling, the estimated volume of groundwater removed from the river recharge system would be approximately 400 afy. A similar condition exists for Tembladero Slough, where the volume of groundwater removed by the slant well pumping from that system would be about 65 afy. The volume of water flowing to the ocean through the Salinas River in 2012 was about 250,000 afy, so the reduction of 400 afy is about 0.16 percent of the total flow. From a surface water supply standpoint, this magnitude of groundwater diversion from the Salinas River would be a minor, if not immeasurable, reduction in surface water supply. The same conclusion is applied to the Tembladero Slough, where the removal of 65 afy of groundwater discharge would not constitute a recognizable loss in supply for that system. The reduction of surface water attributable to slant well pumping is not a substantial reduction of water supply and thus this impact would be a less than significant impact.

Impacts of the Project on the Surface Water-Groundwater Interaction at CEMEX

The CEMEX facility has several ponds on its property. The largest pond, located to the north of the slant wells, is the source of the sand mined by CEMEX. The impact analysis of MPWSP pumping effects on recharge considered the largest pond to determine whether the proposed project would have an adverse impact on its recharge or on the current sand mining operations. A significant impact would occur if the proposed pumping at CEMEX reduced recharge to the Dune Sand Aquifer or interfered with or otherwise limited the ability of CEMEX to operate due to intolerable draw down in its main sand mining pond.

Pond Operation

The bottom of the large CEMEX dredge pond is assumed to be at about 30 feet below the surface water level in the pond (Geoscience, 2015b). The water level in the pond is in hydraulic connection with the ocean, receiving ocean water as seepage through the beach sand and occasional storm surges over the beach and into the pond. Winter storm surges push sand with very little silt or clay particles over the beach and into the largest pond, and the sand settles to the bottom of the pond. CEMEX then dredges the sand from the pond, sorts the sand into different grain sizes depending on the desired end product, and washes the sand to remove residual salts from seawater. The wash water is routed to the smaller ponds located north and east of the location of the proposed slant wells, where the seawater seeps into the sand and migrates back to the ocean. The smaller ponds are hydraulically disconnected from the underlying Dune Sand Aquifer. The larger, deeper sand source pond is in an area composed entirely of sand. The water level in the largest pond is controlled by the ocean tides (Geoscience, 2015b). Occasionally, storm surges remove the sand barrier between the larger dredge pond and the ocean and the pond temporarily becomes a small bay, as occurred in March 2016. The smaller, shallower wash water ponds are fed entirely by the wash water and are not directly connected to either to the ocean or the underlying groundwater; wash water either evaporates or infiltrates into the shallow sand and migrates to the ocean.

A water level transducer was installed in the large dredge pond on the CEMEX property to monitor changes in water elevations. The most recent monitoring report indicates that the pond is tidally influenced (Geoscience, 2015a, b) due to the proximity of the pond to the ocean (within 200 feet). In addition, the pond water level monitoring indicates that the sand mining operations conducted on Monday through Friday also affect pond water levels. Pond water levels fluctuate and decrease during the week as sand and water is pumped out of the pond and then stabilize on Saturday and Sunday when the sand mining operations are closed.

Impact Analysis for CEMEX Dredging Pond Drawdown

This impact analysis is based on the CEMEX model analysis completed in September 2014, data generated in April 2015 after a five-day constant discharge pump test of the test slant well, and dredge pond transducer data obtained between April and October 2015.

In the September 2014 analysis, the localized CEMEX model was used to determine whether the dredge pond would be influenced by pumping at the proposed test well operating at 2,500 gallons per minute (gpm) (Geoscience, 2014a). The localized CEMEX model simulates the response of the Dune Sand Aquifer in its second, third, and fourth vertical layers. The depth of the large dredge pond falls within the second and part of the third model layer so the response in the dredge pond would be captured as a response in the upper portion of the Dune Sand Aquifer. The CEMEX model simulated the test well pumping for 8 months at 2,500 gpm. The results of the model run showed a drawdown at the dredge pond of about 1 foot. If a drawdown of 1 foot occurred for a pumping rate of 2,500 gpm from one well (the test slant well), there is a possibility that additional drawdown would occur in the pond during operation of the all of the proposed slant wells, which would operate at the combined pumping rate of 24.1 mgd or about 16,736 gpm. However, when compared to the daily tidal fluctuations in the dredge pond water levels, the decline in the water surface of any depth would be masked by the consistent recharge and tidal influence from the ocean.

On March 8, 2015, a water-level transducer was installed in the dredge pond. In April 2015, a five-day constant-discharge pumping test was conducted (Geoscience, 2015b). The transducer showed a series of cyclical fluctuations from March 8 through March 21, followed by relatively flat levels through April 2, followed by similar pattern of cyclical fluctuations at similar elevations through April 11. The cyclical fluctuations are due to a combination of tidal influence and the routine dredging of the pond for sand. The early March fluctuations, which occurred before the pumping test, and the early April fluctuations, which occurred during the pumping test, show a similar pattern at about the same water level, indicating that the water level in the dredge pond was not being influenced by the pumping of the test slant well. This also indicates that as the pond is dredged, the water levels quickly recover, with seawater seeping through the loose sand on the beach.

The transducer continued to collect useable data from April 22, 2015 until October 28, 2015, when the dredge pond was breached and the transducer was no longer operable. The data, discussed in the EIR/EIS, Appendix E3, Section 2.4.5.3, shows how the water in the dredge pond is influenced by the fluctuation of tides and dredge operations. Figure 2.1 of Appendix E3 shows a slight declining trend in dredge pond water levels from the start of the test slant well long-term test on April 22 to June 5 when the test slant well was shut down. The decline amounted to about a foot but then recovered when the pump was turned off. When the slant well was not operating, water levels in the dredge pond fluctuated by as much as two feet. The pond is hydraulically connected to the ocean through the beach sand and the occasional breach during large storms. The data verify that, because of this connection, the pond is consistently influenced by the ocean where water enters the pond during flood tide and flows out at ebb tide. The data collected at the dredge pond reveal that while there may be a slight response in the dredge pond from MPWSP pumping, water level changes due to dredge operations and daily tides would have a much greater effect on dredge pond water levels. The direct hydraulic connection of the dredge pond to the ocean would provide constant recharge to the pond and depletions due to pumping would be immediately replaced by induced seepage through the beach sands from the ocean. Therefore, the response on the dredge pond, if any, from the MPWSP pumping, would not interfere with recharge to the Dune Sand Aquifer, nor would it inhibit sand mining operations by depleting available water supplies to the pond. This impact is less than significant.

Impacts Related to Impervious Surfaces

Slant Wells

The subsurface intake system at the CEMEX site would consist of ten subsurface slant wells and associated pipelines, with aboveground electrical control cabinets on concrete pads at each well head. Each of the five new well sites would be on a 5,250- to 6,025-square-foot graded pad within the coastal sand dunes, where the surrounding and underlying soil is loose sand. The pipelines would be completed below ground. Precipitation would continue to infiltrate into the subsurface sands to the water table or migrate to the ocean. The minor amount of added impervious surface at the well sites would not meaningfully reduce potential recharge area of the shallow aquifer.

ASR Injection/Extraction Wells

Each of the two new ASR injection/extraction wells and pumps, and electrical control system would be housed in a 900-square-foot concrete pump house. The two 900-square-foot pump houses would be surrounded by unpaved soil. Rainwater falling on the pump houses would flow off the structures into the surrounding unpaved areas and would infiltrate down to the water table. Therefore, there would be no reduction to groundwater recharge.

MPWSP Desalination Plant

The MPWSP Desalination Plant would consist of several structures that would result in the creation of about 15 acres of new impervious surfaces that would restrict rainfall from infiltrating into the subsurface. However, rainwater falling on these structures would be routed through conventional drainage structures unpaved onsite area. Rainwater would still be able to infiltrate into the subsurface and recharge the underlying aquifer. Therefore, there would be no reduction to groundwater recharge.

Carmel Valley Pump Station

The Carmel Valley Pump Station would be enclosed in a 500-square-foot, single-story building built in an unpaved area. The surrounding area would remain unpaved, providing a route for rainwater falling on the pump station to infiltrate into the ground and recharge the underlying aquifer. The Carmel Valley Pump Station would not result in a reduction to groundwater recharge.

Pipelines

Construction workers would install 21 total miles of pipelines within or adjacent to existing roads and recreational trails. Most pipeline segments would be installed using conventional open-trench technology. The typical trench width would be 6 feet, and the overall construction corridor for pipeline construction would vary from 50 to 100 feet, depending on the size of the pipe being installed. The trenches would be backfilled and the surfaces restored to their pre-existing conditions. Therefore, there would be no change to the existing amount of impervious surfaces and no change to the existing volume of groundwater recharge.

Impact Conclusion Groundwater Recharge

The MPWSP slant wells would divert and capture some groundwater that would otherwise have flowed to the Salinas River and the Tembladero Slough. The amount of groundwater loss from both of these surface water systems would be minor, if not immeasurable, considering the volume of water that flows through them. The reduction of surface water attributable to slant well pumping is not a substantial loss to groundwater supply, nor does it constitute a substantial interference to surface water recharge and thus this impact would be less than significant. While pumping at the slant wells could cause drawdown in the large dredge pond over periods of extended pumping, the magnitude of that response would not interfere with recharge to the Dune Sand Aquifer, nor would it inhibit sand mining operations by depleting available water supplies to the pond. This impact is less than significant. Facilities proposed for the project would slightly increase the amount of impervious surfaces in the project area, but would not reduce the potential for surface water to recharge the underlying aquifers. Impacts associated with changes to groundwater recharge during the operation of all project facilities would be less than significant.

Impacts on All Other MPWSP Components

None of the other proposed facilities would involve the injection or extraction of groundwater. Therefore, there would be no impact on groundwater supplies from the operation of the monitoring wells, MPWSP Desalination Plant, pipelines, and pump stations.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, the MPWSP would not conflict with SGMA because it would not result in any of the undesirable results defined in SGMA. The following subsections summarize the analyses above to provide evidence for this conclusion with respect to groundwater levels and supply; summaries relevant to groundwater quality are provided in Impact 4.4-4.

Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply, or significant and unreasonable reduction of groundwater storage

As explained above, the operation of the subsurface intake system would be expected to form a cone of depression (radius of influence) around the slant wells, which would largely stabilize within 1 to 5 years. The calculated fraction of water that originated in the Basin would be returned to the Basin as in-lieu recharge and, therefore, the quantity of water provided to the CalAm service area would be tied to the amount of water that originated from the ocean. This return option would essentially put the Basin in a “no net loss” position in terms of fresh water quantity and would benefit legal water users by providing fresh water for beneficial use in lieu of Basin pumping.

The lowering of groundwater levels and reduction of water in storage would be limited to the area within the radius of influence. A groundwater level decline between 1 and 5 feet would not expose well screens, cause damage, or reduce yield in the groundwater supply wells influenced by MPWSP pumping because the pumps in those wells are set much deeper to account for the tens of feet of annual water level changes due to seasonal fluctuations and agricultural pumping. Therefore, the few users of groundwater within that area would experience no significant and unreasonable lowering of groundwater levels, depletion of water supply, or reduction in storage.

Significant and unreasonable land subsidence that substantially interferes with surface land uses

As explained in Impact 4.2-8 in Section 4.2, Geology, Soils, and Seismicity, subsurface conditions that are more conducive to subsidence include clay or organic-rich soils. The units from which the proposed slant wells would be pumping are composed predominantly of sand and gravel. Sand- and gravel-rich soils are less prone to subsidence because the larger grains comprise a skeleton[37] that is less dependent on water pressure for support. In addition, the subsurface slant wells would draw the large majority of source water from the offshore coastal aquifers, where seawater would replace the water pumped from the slant wells, as discussed above. The continuous replacement of water would keep the pore spaces between the grains filled with water, further supporting the granular structure. Consequently, the soil structure above the slant wells would not subside as a result of proposed project pumping.

Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water

As described above under the heading “Impacts of the Project on the Surface Water-Groundwater Interaction at the Salinas River,” the annual volume of water flowing to the ocean through the Salinas River is about 250,000 afy, meaning the reduction of 400 afy would be about 0.16 percent of the total flow. From a surface water supply standpoint, this magnitude of groundwater diversion from the Salinas River would be a minor, if not undetectable, reduction in surface water supply. The same conclusion applies to the Tembladero Slough, where the removal of 65 afy of

[37] The grains are in contact with one another such that the combined grains support the weight of the overlying material.

groundwater discharge would not constitute a recognizable loss in supply for that system. The proposed project would not result in adverse impacts on beneficial uses of surface water.

Conclusion for Impact 4.4-3

The proposed project would extract mostly seawater and some brackish groundwater from a localized area; no fresh water supplies would be removed from the basin. When water is returned to the basin, groundwater elevations and the volume of water in storage would increase in the 400-Foot Aquifer underlying the CSIP and CCSD and adjacent areas. Water levels in nearby wells may decline in the 180-FTE Aquifer between 1 and 5 feet, but that would not expose screens, cause damage, or reduce yield in the groundwater supply wells. Injection and extraction through the ASR well system would be managed so that the water provided from the desalination plant would not constitute a net change in storage. The reduction of surface water from the Salinas River attributable to slant well pumping would not be a substantial loss to water supply, nor would it constitute a substantial interference to surface water recharge. Pumping at the slant wells could cause drawdown in the large dredge pond at CEMEX over periods of extended pumping, but the magnitude of that response would not interfere with recharge. The MPWSP may slightly increase the area of impervious surface in the project area, but it would not reduce the potential for surface water to recharge the underlying aquifers. Impacts associated with changes to groundwater recharge during the operation of all project facilities would be less than significant.

Applicant Proposed Measure - Groundwater Monitoring and Avoidance of Well Damage

The project applicant has proposed to expand the existing regional groundwater monitoring program to include the area where groundwater elevations are anticipated to decrease in the Dune Sand Aquifer, the 180-FTE Aquifer and the 400-Foot Aquifer as well as the Deeper Aquifer. This Applicant Proposed Measure is not required to reduce a potential impact to less than significant.

Applicant Proposed Measure

Applicant Proposed Measure 4.4-3 applies only to the Subsurface Intake System.

> **Applicant Proposed Measure 4.4-3: Groundwater Monitoring and Avoidance of Well Damage.**
>
> Prior to the start of MPWSP slant well construction, CalAm, working with MCWRA, shall develop a groundwater monitoring and reporting program (the "Program") to the satisfaction of MCWRA. All costs of Program development and implementation shall be borne by CalAm either directly or through funding of MCWRA's staff, consultants and Program activities. The Program shall augment the MCWRA's existing regional groundwater monitoring network to focus on the area that could be affected by the proposed slant wells. The geographic area of the Program shall be within the model domain of the North Marina Groundwater Model, also referred to as NMGWM^{2016} and include the Dune Sand Aquifer, the 180-Foot Aquifer, the 400-Foot Aquifer and the Deeper Aquifer (i.e., the 900-Foot Aquifer) of the Salinas Valley Groundwater Basin (the "Monitoring Area"). The purpose of the Program is to ensure that owners of existing public or private groundwater supply wells within the Monitoring Area on the date the MPWSP commences

slant well pumping ("Active Supply Wells") suffer no harm as a result of MPWSP slant well pumping. The elements of the Program proposed under this measure are described below.

1. A network of monitoring wells has been completed on and near the CEMEX property as part of the CalAm test slant well project. These well clusters monitor water elevation and quality at various depth intervals within the Dune Sand Aquifer, the 180-Foot Aquifer, and the 400-Foot Aquifer and shall be included in the Program's monitoring network. These existing monitoring wells are subject to relocation, replacement, or substitution by new or other monitoring wells developed as part of the Program as determined by MCWRA.

2. In addition, using information from the Groundwater Extraction Management System (GEMS) maintained by MCWRA and from the State Water Resources Control Board's Division of Drinking Water, CalAm, in coordination with MCWRA, shall identify Active Supply Wells in the Monitoring Area and offer to owners of identified Active Supply Wells the opportunity to participate in the Program for groundwater elevation and water quality monitoring. The owners of Active Supply Wells in the Monitoring Area will receive at least 60 days' notice (via email, if available, and via certified mail) of the opportunity to participate in the Program, and may elect in writing to participate in the Program as to their Active Supply Wells ("Participating Active Supply Wells"). This opt-in process must occur sufficiently in advance of MPWSP slant well pumping so that information on pre-MPWSP conditions can be obtained for each Participating Active Supply Well. Prior to the start of MPWSP slant well pumping, an independent California-certified hydrogeologist retained and directed by MCWRA (the "Hydrogeologist") shall evaluate the conditions and characteristics (e.g., well depth, well screen interval, pump depth and condition, flow rates, and drawdown) of each Participating Active Supply Well to develop pre-pumping data for each well. Water elevation and quality monitoring pursuant to the Program shall begin following initial groundwater well assessment, and shall continue at intervals specified in the Program (e.g., more frequently at the beginning of MPWSP slant well pumping and less often after stabilization of groundwater levels) until the well owner ceases pumping from the monitored well, or until the well owner agrees that monitoring is no longer required.

3. Prior to the start of MPWSP slant well pumping, CalAm and MCWRA shall review the current (as updated if needed) inventory of monitoring wells within the Monitoring Area, and identify locations within the Monitoring Area lacking monitoring coverage and that warrant monitoring in order to evaluate potential effects on Participating Active Supply Wells from MPWSP slant well pumping. Based upon that review, MCWRA may require that CalAm fund the installation of new monitoring wells in the Monitoring Area to be installed before MPWSP slant well pumping begins. The number of new monitoring well sites in the Monitoring Area and the location of those new monitoring well sites shall be determined by MCWRA. The area of groundwater monitoring under the Program may be extended outside of the Monitoring Area if warranted to evaluate potential MPWSP slant well pumping effects on Participating Active Supply Wells and recommended by the Hydrogeologist.

4. The groundwater data developed through the Program shall be collected by or provided to MCWRA at intervals identified in the Program, but in no event longer than 45 days from such data being obtained, to evaluate whether MPWSP slant well pumping is causing consistent and measurable drawdown of local groundwater levels that is

distinguishable from seasonal or multi-year groundwater level fluctuations. In the event that MCWRA identifies a consistent and measurable drawdown in groundwater levels and determines that such drawdown is potentially attributable to MPWSP slant well pumping and independent of seasonal or multi-year groundwater level fluctuations or any regional trends, the Hydrogeologist shall then determine if the observed degree of drawdown would damage or otherwise adversely affect any existing Participating Active Supply Wells. Adverse effects from lowered groundwater levels in Participating Active Supply Wells may include water elevation acute and long-term declines that draw water below pump intakes, causing cavitation due to exposure of the well screen, reduced well yields and pumping rates, increased energy costs to power the well, or changes in groundwater quality indicating that MPWSP slant well pumping is drawing lower quality water toward the well. Active Supply Wells that are not Participating Active Supply Wells will be considered for a determination by the Hydrogeologist of potential damage or adverse effects reasonably attributable to MPWSP slant well pumping (as described above) if substantial, credible evidence is submitted by the owners of such Active Supply Wells concerning damage or adverse effects at such wells, and such effects are verified by CalAm and the Hydrogeologist.

5. If the Hydrogeologist determines that a Participating Active Supply Well or an Active Supply Well that Cal-Am and the Hydrogeologist have verified for damage or adverse effects pursuant to Section 4 above, has been damaged or otherwise negatively affected by MPWSP slant well pumping, CalAm and the Hydrogeologist shall coordinate with the well owner to develop and implement a mutually agreed upon course of action. Such course of action may include but not be limited to repairing or deepening the existing well, restoring groundwater yield by improving well efficiency, facilitating an interim or long-term replacement of water supply, constructing a new well, or compensating the owner for increased pumping costs. Any interim or long-term replacement water supply shall be of the same or better quality (i.e., potable or non-potable) and predicted quantity as the existing supply of the Active Supply Well and shall be suitable for the purposes served by the existing Active Supply Well. Before CalAm undertakes any course of action to remedy the MPWSP slant well pumping effects on an Active Supply Well, the Hydrogeologist shall authorize such action and provide notice of such action to MCWRA.

Applicant Proposed Measure 4.4-3 would monitor changes in the groundwater surface elevations caused by the proposed pumping at the slant wells through a voluntary program and use of new groundwater monitoring wells. If it is determined that the project is causing groundwater levels to damage local active wells within the Dune Sand, 180-Foot/FTE, 400-Foot Aquifer or Deeper Aquifer, this measure would ensure that active wells are repaired or replaced. Implementation of **Applicant Proposed Measure 4.4-3** is not necessary to address any significant project effect.

Impact 4.4-4: Violate any groundwater quality standards or otherwise degrade groundwater quality during operations. (*Less than Significant with Mitigation*)

Impact 4.4-4 addresses the impacts on groundwater quality during the operation of the proposed project. Water quality considerations associated with the project operations include the exacerbation of seawater intrusion and the potential for the proposed project to cause new contamination, or to extend the limits of existing groundwater contamination through pumping at the subsurface intake system, ASR injection/extraction wells, and other project facilities. The slant wells would extract water from the Dune Sand Aquifer and the 180-FTE Aquifer of the SVGB, while the ASR wells would periodically inject water into and extract groundwater from the Santa Margarita Sandstone in the SGB.

Operation of Subsurface Slant Wells

Impact on Groundwater Quality Within Slant Well Pumping Area of Influence

This impact analysis considers the effect of continuous pumping at the CEMEX site on local groundwater quality in the Dune Sand and 180-FTE Aquifer. As discussed in Impact 4.4-3, and shown in **Figures 4.4-10** and **4.4-11**, the water quality in the Dune Sand and 180-FTE Aquifers is degraded from seawater intrusion and has been for decades. The MPWSP slant wells would pump that water for the desalination plant source water. **Figure 4.4-13a** shows the extent of the cone of depression formed in the 180-FTE Aquifer during slant well pumping at the CEMEX site and the resultant groundwater drawdown projected under the conservative pumping scenario where sea level is at current levels and no water is return to the basin as part of the MPWSP. **Figure 4.4-13b** shows the project capture zone that would be created from the slant well pumping and **Figure 4.4-13c** depicts the relationship between the cone of depression and the capture zone.

The timeframe over which the cone of depression would develop to its full extent is also an important consideration in this analysis. According to the NMGWM[2016], the time required for the cone of depression in the 180-FTE Aquifer to reach its maximum extent, as shown in **Figure 4.4-13a**, is between 1 and 5 years after groundwater project start-up. After 5 years, the cone of depression would equilibrate and remain somewhat stable throughout the projected 63 years of operation. Based on this timeframe, localized changes in water quality could be realized within the first 5 years of project operation and could stabilize at that level. The NMGWM[2016] also projects that the timeframe for groundwater recovery after the MPWSP is offline would be in the range of 1 to 5 years.

From the time the slant wells begin pumping, and throughout the life of the project, local groundwater quality within the capture zone could change from highly brackish (23,400 mg/L TDS to 30,900 mg/L TDS) to more saline groundwater (seawater has a TDS concentration of about 33,500 mg/L). The degradation in water quality (measured as an increase in TDS) would occur because the slant wells would first draw in the ambient, highly brackish groundwater that is currently within the aquifer formation and, because the capture zone would be adjacent to the coast, seawater would flow in to replace it. This effect would occur only in the confines of the capture zone near the CEMEX site and would not affect groundwater from inland portions of the aquifers because inland groundwater east of the capture zone is under the influence of the inland, regional groundwater gradient.

This impact analysis considers whether this projected degradation in localized water quality would constitute a significant impact. A significant impact would occur if the proposed project would violate water quality standards or degrade a groundwater source such that it would interrupt or eliminate the available potable groundwater for other users in the basin. Groundwater in the Dune Sand and the 180-FTE Aquifers within the capture zone is not used for potable supply or irrigation and it is well documented that the groundwater is highly brackish (TDS concentration in excess of 16,917 mg/L). As discussed in the Impact 4.4-3, quality within the proposed MPWSP slant well capture zone far exceeds the 3,000 mg/L threshold set by the SWRCB that determines whether a surface or groundwater is suitable, or potentially suitable for municipal or domestic water supply and should be so designated by the Regional Boards. The highly brackish water in the capture zone is not reasonably expected to supply a public water system without desalination. As stated in Impact 4.4-3, the use of the current groundwater production in this area is limited to minor irrigation and dust control. There are no water supply wells pumping potable water, and most of the wells in this area are no longer active because of seawater intrusion.

Based on current groundwater quality and the minimal groundwater use within the area affected by slant well pumping, the localized change in groundwater quality that could occur as a result of slant well pumping is not expected to violate water quality standards or interrupt or eliminate the potable or irrigation groundwater supply available to other basin users. Therefore, this impact is considered less than significant.

Impact on Seawater Intrusion

As shown on **Figures 4.4-10** and **4.4-11**, the current location of the seawater intrusion front is about 8 miles inland in the 180-Foot Aquifer and 3.5 miles inland in the 400-Foot Aquifer. Once operational, the proposed slant wells would extract 24.1 mgd from the subsurface. A significant impact would occur if the proposed project caused the seawater intrusion front to migrate further inland, thereby exacerbating the seawater intrusion condition in the SVGB.

The effects on seawater intrusion were evaluated using the NMGWM^{2016} with particle tracking (described in the Approach to Analysis section, above). **Figure 4.4-17** shows the coastal seawater intrusion in the SVGB using the seawater intrusion front location estimated by the MCWRA and shown in **Figures 4.4-10** and **4.4-11**. Before running the model to simulate the 63 years of operation, individual water "particles" were placed along the leading edge of the mapped seawater intrusion front. Without the project, these particles are expected to continue to migrate inland with the movement of the seawater intrusion front. The NMGWM^{2016} is a superposition model, meaning that modeled project effects are isolated from all other stresses in the basin, such as the effects from other groundwater pumpers, inland pressure gradients, injection systems, and recharge. In superposition, the NMGWM^{2016} output is therefore the change attributable solely to the slant well pumping. **Figure 4.4-17** depicts the resulting particle-tracking outputs, showing that a number of particles radiate away from the seawater intrusion front back towards the coast. In **Figure 4.4-17**, some particle locations change substantially, whereas others do not. As to those that do change, the change in particle location shows where the seawater intrusion front would be after 63 years of MPWSP pumping *if that was the only factor affecting groundwater movement in the basin* (no recharge, no groundwater pumping, no pressure gradients, etc.). Therefore, Figure 4.4-17 illustrates the MPWSP's contribution to redirecting or reversing the inland advance of seawater intrusion. Because there are many stresses in the basin, the MPWSP project would not necessarily draw the leading edge of the seawater intrusion line back towards the coast to the extent shown by the particle-tracking output, but it does indicate that the MPWSP provides a benefit for the basin. Based on the particle-tracking results, the MPWSP would not exacerbate seawater intrusion, and groundwater extraction from the coast, as part of project operations, would be expected to retard future inland migration of the seawater intrusion front. The proposed project would facilitate the reduction of seawater intrusion in the long term, and the impacts of the proposed project are considered less than significant.

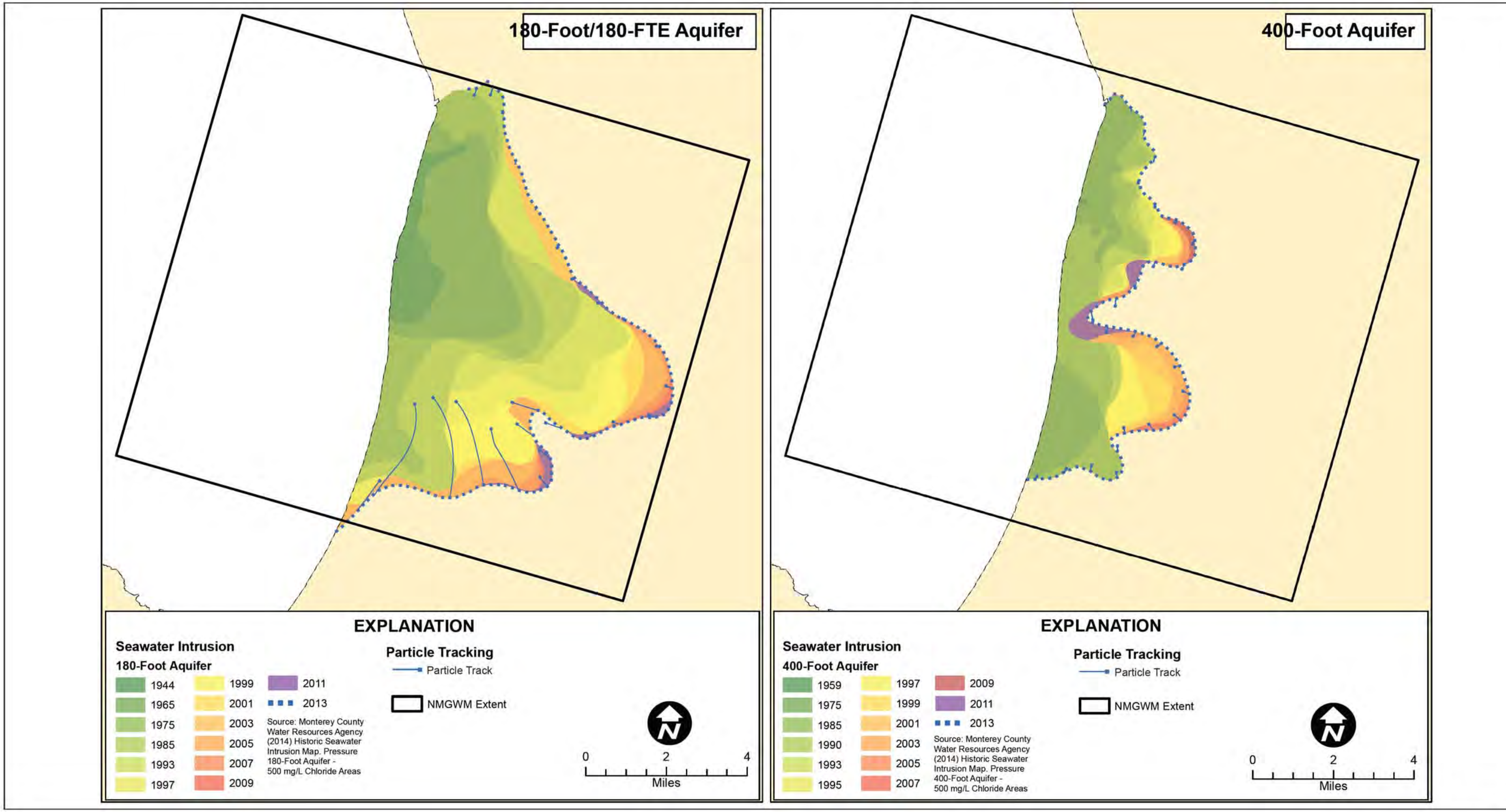
Impacts Associated with Existing Groundwater Remediation Systems

Past industrial, commercial, or military sites have residual soil and groundwater contamination caused by past spills, leaking underground tanks, unlined chemical disposal sites or inadvertent land disposal of chemicals in the SVGB and the SGB, as discussed in detail in Section 4.7, Hazards and Hazardous Materials. When contaminated groundwater is found at these sites, a common remedy is to pump the contaminated water out, treat it, and either dispose of it or use it for non-potable supply; this process is referred to as "pump and treat." Pumping contaminated water out of the ground requires extraction wells that, similar to the slant wells proposed by the proposed project, can create a cone of depression and an accompanying area of influence. When the area of influence of a pump and treat site intersects that of another water extraction system, the cones of depression interfere with each other and can cause the groundwater contamination to spread into previously uncontaminated or previously remediated areas.

The proposed slant wells would produce a radius of influence in the Dune Sand Aquifer and the 180-FTE Aquifer, as shown on **Figures 4.4-14** and **4.4-15** and as discussed in Impact 4.4-3. Within the CEMEX area, the NMGWM^{2016} projects that groundwater elevations could decrease and that decrease could incrementally affect groundwater flow directions. If there are nearby inland sites that are remediating contaminated groundwater in the same aquifers and that are located within the radius of influence of the slant wells, then the pumping of the slant wells could potentially interfere with those remediation activities, pulling contaminated groundwater into currently uncontaminated areas and degrading the existing water quality. This would violate the state policy of maintaining the existing water quality. A significant impact would occur if the proposed project created a condition that would violate water quality standards or otherwise degrade water quality.

The U.S. Army has been conducting investigation and cleanup activities at the former Fort Ord military reservation since 1986 (Fort Ord Base Realignment and Closure Office, U.S. Army, 2012). The ongoing remediation will continue until contaminant levels in the groundwater are reduced to clean-up levels or below, and are protective of human health. The northwestern border or the former Fort Ord is located within 2 miles southeast of the subsurface intake system.

As discussed in the Setting for Section 4.7, Hazards and Hazardous Materials, the former Fort Ord military base has several plumes of contaminated groundwater located southeast of the subsurface intake system, as shown on **Figure 4.7-1**. Source removal and ongoing groundwater remediation efforts have effectively reduced the contaminant concentrations and extents in these plumes. Three of the plumes closest to the slant wells are located within the area in which the NMGWM^{2016} estimates groundwater levels would decrease by one to two feet in the Dune Sand Aquifer and the 180-Foot Aquifer. The A-Aquifer is a shallow inland aquifer above the 180-Foot Aquifer and is not known to be hydraulically connected to the Dune Sand Aquifer at the proposed slant well locations. **Figure 4.7-1** shows the location and current configuration of the contaminant



SOURCE: HydroFocus, 2016

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Figure 4.4-17
Proposed Project Impact on Location of Seawater Intrusion Front

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plumes and **Figure 4.4-15** shows the -1-foot drawdown contour of what is considered the “worst case” aquifer response from the proposed project (180-FTE Aquifer, no return water, with 2012 sea level conditions). Comparison of **Figures 4.7-1** and **4.4-15** shows that the -1-foot contour is approaching the contaminant plumes. If the drawdown caused by the slant well pumping was to intersect and alter the local flow gradient near the plumes, the slight change could influence the plumes to migrate further northwest into currently uncontaminated areas and to degrade water quality. The possible overlap of the slant well radius of influence with each of these plumes is discussed below.

OUCTP A-Aquifer Plume. The OUCTP A-Aquifer Plume, located about 2 miles southeast of the slant wells, is contaminated by carbon tetrachloride. This plume was previously under remediation by pump-and-treat technology (Ahtna, 2016). The A-Aquifer plume is currently being treated using enhanced in situ bioremediation, followed by monitored natural attenuation. This method involves enhancing naturally occurring microbes to break down the contaminants into non-toxic compounds, and does not require the extraction of groundwater. If the radius of influence of the proposed slant wells does reach the western portion of the OUCTP A-Aquifer Plume, then the decrease in groundwater elevations could alter the existing groundwater flow direction. This change in flow direction could pull the OUCTP Plume further northwest, spreading the contamination to areas that are not now contaminated above action levels. As previously discussed, this location is about 2 miles from the slant wells. At this distance, the NMGWM^{2016} simulations decrease in accuracy and the anticipated 1 to 2-foot groundwater elevation decrease within the radius of influence is less certain to extend this far. Nonetheless, the simulation indicates that the decrease in groundwater elevations is possible and could result in a significant impact. This impact would be reduced to less than significant with the implementation of **Mitigation Measure 4.4-4** (**Groundwater Monitoring and Avoidance of Impacts on Groundwater Remediation Plumes**), which would require CalAm to monitor groundwater flow directions at the nearby known contaminated groundwater plumes and to work with the responsible parties if the proposed project would adversely impact those ongoing remediation efforts.

OUCTP 180-Foot-Aquifer Plumes. As described in detail in EIR/EIS Section 4.7, the OUCTP 180-Foot Aquifer Plumes are located a little over 3 miles southeast of the slant wells and are considered to have an upper and lower portion. The upper plume, referred to as the OUCTP Upper 180-Foot Aquifer Plume, is undergoing pump-and-treat technology for groundwater remediation (Ahtna, 2016). At its largest, the treatment system had seven extraction wells operating throughout the extent of the plume, including at the westernmost edge of the plume. As cleanup of the plume has proceeded, the extent of the plume has become smaller as concentrations in the groundwater have decreased. Currently, only one extraction well is in operation in the central area of the plume. The operation of the extraction well also serves to contain the plume and prevent its migration further west because groundwater flows toward the extraction well and cannot escape further west. As measured during the December 2014 monitoring event, the cone of depression around the extraction well was about 22 feet below the surrounding groundwater levels. With a cone of depression of 10 or more feet, the 1- to 2-foot decrease in groundwater levels caused by the proposed slant wells would be unable to overcome the cone of depression at the extraction wells.

The lower plume, referred to as the OUCTP Lower 180-Foot Aquifer Plume, was created when carbon tetrachloride migrated downward into the lower portion of the 180-Foot Aquifer. This plume is undergoing monitored natural attenuation that was implemented in March 2011. There is a contingency plan for additional well-head groundwater treatment if chemicals associated with the OUCTP plumes are detected in groundwater supply wells.

Given the current pump and treat remediation activity in the upper plume and the natural attenuation in the lower plume, in addition to the distance of these plumes from the MPWSP slant well pumping, the potential for the cone of depression of the MPWSP slant wells to interfere with OUCTP 180-Foot Aquifer plumes is low and the impact is considered less than significant with no mitigation proposed. However, the groundwater monitoring under Mitigation Measure 4.4-4, would require CalAm to continually monitor flow directions and water quality at the nearby OUCTP plumes, and to take appropriate action if interference occurs.

Impacts Associated with ASR Injection/Extraction Wells

Interference with Existing Groundwater Remediation Systems

The injection of desalinated product water into the proposed ASR-5 and ASR-6 Wells would increase groundwater elevations and the volume of water in underground storage. This increase in groundwater elevations would alter groundwater flow patterns in the vicinity of the proposed ASR-5 and ASR-6 Wells. If there are nearby sites that are remediating contaminated groundwater in the Santa Margarita Sandstone aquifer and are located within the area where groundwater elevations are expected to rise, then the increase of groundwater elevations could interfere with those remediation activities, pushing contaminated groundwater into currently uncontaminated areas and degrading the existing water quality.

As previously discussed, the addition of the ASR injection/extraction wells would increase the capacity to inject and store water in the Santa Margarita Sandstone in the SGB. The SGB is separated by a groundwater divide from the SVGB to the north, where the former Fort Ord sites discussed above are located. As previously discussed, water would be injected and extracted from the desalination plant into the SGB such that there would be no net negative change in storage on an annual basis.

The target aquifer for injection and storage is in the Santa Margarita Sandstone, at a depth of about 1,000 feet below the ground surface. Currently, a groundwater depression caused by historical overdraft is located to the south of the ASR system, with its center close to General Jim Moore Boulevard, as shown on **Figures 4.4-7** and **4.4-8**. The presence of this groundwater depression would cause the additional water injected and stored in the Santa Margarita Sandstone to flow toward that depression to the south. Consequently, only remediation sites with groundwater contamination in the Santa Margarita Sandstone at about 1,000 feet below the ground surface and located within the area between the ASR injection/extraction wells and the center of the groundwater depression could be affected. As shown on **Figures 4.7-1** and **4.7-2**, the nearest contaminated sites are located along Del Monte Boulevard, near the coast and west of the groundwater depression; however, the contamination is in the surficial Aromas Sand Aquifer. There are no known contaminated sites undergoing groundwater remediation in the area between the ASR injection/extraction wells and the edge of the groundwater depression. Therefore, the potential for the ASR injection/extraction wells operation to interfere with groundwater remediation activities at nearby contaminated sites would be low and thus, this impact is less than significant.

Addition of Treated Water to the Santa Margarita Aquifer

The ASR component for the proposed project would continue to utilize and augment the existing ASR system. The expansion includes the construction of two additional ASR injection/extraction wells along General Jim Moore Boulevard (see **Figure 3-9a**) that would increase the reliability of storing Carmel River water in the SGB, and would facilitate the injection, storage, and extraction of desalinated water. The source water pumped from the slant wells would be treated to potable drinking water standards at the proposed desalination plant and pumped through the water supply distribution system to the SGB, where the water would be injected into the ASR injection/extraction wells for later recovery during dry periods (see **Figure 3-2**). As discussed in the Setting, the primary water quality concern associated with ASR projects using potable water is that DBPs, including THMs and HAAs, are formed during the disinfection process. Additionally, the injection of oxygenated water could potentially alter the geochemistry of the groundwater and increase the concentration of minerals in groundwater.

The existing ASR system treats surface water from the Carmel River to drinking water standards and then injects that treated water into storage in the Santa Margarita Sandstone for later extraction and use. As discussed in the Setting, the MPWMD conducted investigations to evaluate the effects of injecting water treated to drinking water standards into the Santa Margarita Sandstone. Their investigations, as well as ongoing monitoring, concluded that the DBPs do increase upon initial injection of treated surface water into the Santa Margarita Sandstone, but concentrations steadily decreased with time and the existing conditions are restored over the course of six to eight months (Pueblo Water Resources, 2014). Groundwater monitoring results indicate that over the course of that time, the pH remains neutral (between 6 and 8), indicating relatively stable geochemical conditions.

The RWQCB currently regulates the ASR project under Permit 20808C. As a result, the MPWMD continues to conduct groundwater studies and monitoring to document the changes to the groundwater system due to ASR, and to ensure that the ASR project does not degrade groundwater quality within the SGB. The RWQCB will continue to require a monitoring and response program for continued operation of the project and to protect groundwater quality in the Santa Margarita Sandstone, ands any expansion of the ASR project would require the approval from the RWQCB for implementation, which would require a similar level of water quality testing and monitoring to ensure that the injected water would not degrade the receiving groundwater in the SGB.

In accordance with the evaluation criteria, this impact would be significant if adding treated desalinated water into the current ASR system degraded the existing groundwater quality. **Table 4.4-11** compares the water chemistry of the treated Carmel River water to the water chemistry of desalinated water currently produced by the Sand City desalination plant. The Sand City desalination plant uses the same technology that would be used by the proposed desalination plant, so the resulting water chemistry would be similar. As shown in **Table 4.4-11**, the water chemistry of the treated Carmel River water is similar to the Sand City desalination plant product water. Therefore, it would be reasonable to expect that the Santa Margarita Sandstone would have the same reaction to the injection of the treated desalination plant water as to the treated Carmel River water. This is a less than significant impact.

TABLE 4.4-11
WATER CHEMISTRY OF TREATED CARMEL RIVER WATER AND SAND CITY DESALINATED WATER

Chemical Parameter	Treated Carmel River Water	Treated Sand City Desalinated Water
Alkalinity as $CaCO_3$	129	55 - 125
Aluminum	0.025	nd (0.010)
Ammonia Nitrogen	0.1	na
Arsenic	nd (0.005)	nd (0.001)
Antimony	na	nd (0.0004)
Barium	0.056	0.014
Boron	na	0.5 – 0.877
Bromide	0.11	na
Beryllium	na	nd (0.0003)
Cadmium	na	nd (0.001)
Calcium	36	18 – 45
Chloride	32	72
Dissolved Organic Carbon	1.4	na
Chromium	na	nd (0.007)
Cobalt	na	na
Dissolved Oxygen	7.43	9.77
Electrical Conductivity	510	315 – 690
Fluoride	0.30	0.10
Iron	0.001	nd (0.06)
Lead	na	nd (0.001)
Magnesium	14	nd (1) – 8
Manganese	0.001	nd (0.010)
Mercury	na	nd (0.0002)
Molybdenum	na	0.003
Nickel	na	0.001
Nitrate/Nitrite as NO_3	0.05	na
Oxygen Reduction Potential (ORP)	749	128.8
Ortho-Phosphate	na	nd (0.77)
Total Phosphorous	0.34	na
Potassium	2.9	nd (5)
pH	7.70	7.51
Selenium	0.0017	nd (0.002)
Silicon	8.41	nd (10) – 12
Silver	na	nd (0.010)
Sodium	42	51.9
Strontium	0.200	0.131
Sulfate as SO_4	84.9	19.2
Thallium	na	nd (0.0003)
Uranium	0.0025	na
Vanadium	na	nd (0.050)
Zinc	0.210	nd (0.050)

NOTES: All concentrations in milligrams per liter (mg/L) except conductivity (micromhos per centimeter), ORP (millivolts), and pH (pH units)
na = not analyzed
nd = not detected above reporting limit in parentheses

SOURCE: EcoEngineers, 2008; Sand City Desalination Plant, 2011, 2014.

Maintenance of the ASR Wells

ASR injection/extraction wells sites are susceptible to well plugging because all water sources have at least some level of suspended solids, which can include particulates, bionutrients, or oxidants (Pueblo Water Resources, 2014). During injection, a trace amount of suspended solids is collected in the gravel pack of the well, in the aquifer material surrounding the gravel pack of the well, and in the silt trap of the well pipe.[38] Over time, the accumulated silt will clog the pore spaces of the well gravel pack and native aquifer materials, restricting the flow of aquifer water into the well and reducing well efficiencies. As a part of the routine operation of the ASR injection/extraction wells, each well must be periodically cleaned to maintain well efficiency. The cleaning process involves backflushing the wells and pumping out the turbid water. The inappropriate discharge of this turbid, sediment-laden, backflush water could adversely affect groundwater resources.

The well maintenance activities of the existing ASR injection/extraction wells have indicated that a weekly frequency of backflushing keeps the aquifer pore spaces clear of sediment and maintains well efficiencies (Pueblo Water Resources, 2014). The backflushing process consists of the following steps:

- Removing the well pump assembly
- Mechanically brushing the wells screens to dislodge sediment
- Bailing out the sediment-laden water
- Airlifting and swabbing the well pipe
- Chemically treating the well screen with glycolic acid and hydrochloric acid to remove and inhibit scale growth in the well screens
- Airlifting and swabbing the well pipe
- Chlorinating the well overnight, followed by airlifting to remove the chlorine solution the next day

Reports indicate that the initial discharge of backwash is a deep orange-brown turbid water, becoming cloudy after about 5 minutes, and clear within about 15 to 20 minutes for each screen interval being cleaned (Pueblo Water Resources, 2014). The effectiveness of the backflushing is checked by 10-minute specific capacity tests to verify the return of the well efficiency.

The discharge water would be pumped through subsurface piping and conveyed through the proposed ASR Pump-to-Waste Pipeline to the existing settling basin for the Phase I facilities at the intersection of General Jim Moore Boulevard and Coe Avenue, and infiltrated into the ground (**Figure 3-9a**). The settling basin is unlined to allow the discharge water to infiltrate into the subsurface soils, eventually migrating down back into the aquifer and leaving the sediment in the basin. The sediment that would accumulate in the basin would be periodically removed and disposed of at an appropriate disposal site. The depth to groundwater beneath the settling basin is about 350 or more feet below the ground surface (Pueblo Water Resources, 2013). It is reasonable

[38] The silt trap of the well is a blank (no well screen openings) section of well pipe below the well screen that provides a place for sediment to accumulate without clogging the well screen.

to expect that a 350-foot deep water column of sediments would be adequate to successfully remove the sediment and polish the water before the water infiltrates into the aquifer.

As a part of the project design, the periodic backflushing of ASR-5 and ASR-6 Wells would use the same process used for the existing ASR injection/extraction wells. Pipelines would be built to connect wells ASR-5 and ASR-6 into the existing pipeline system that includes the pipeline that discharges to the existing settling basin. Routing the discharge water to the existing settling basin and infiltrating it through soil would remove the sediments. Considering this process would be conducted when needed, water quality impacts associated with discharge water would be less than significant impact.

MPWSP Desalination Plant and All Pipelines and Conveyance Facilities

No other project facilities would inject or extract water. Therefore, these project facilities would cause no impact related to groundwater quality or interference with existing groundwater remediation activities.

Impact Conclusion

Slant well pumping at the CEMEX site could intersect the OUCTP A-Aquifer plume and degrade groundwater in areas not affected by the current contaminant plume. This is considered a significant impact that could be reduced to less than significant by **Mitigation Measure 4.4-4**. The OUCTP Upper 180-Foot Aquifer Plume would not be impacted by the MPWSP pumping because the magnitude of drawdown (about 1-2 feet) would be masked by the cone of depression currently created by the pump and treat remediation system. The proposed project would result in a less than significant impact related to interference with existing groundwater remediation activities, with the possible exception of two of the OUCTP plumes at the former Fort Ord. The impact would be reduced to less than significant with the implementation of **Mitigation Measure 4.4-4**, described below.

All Other Project Components

The operation of the MPWSP Desalination Plant, monitoring wells, pipelines, and pump stations would not involve the use of or discharges to groundwater. Therefore, there would be no impact relative to groundwater quality.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, the MPWSP would not conflict with SGMA because it would not result in any of the undesirable results defined in SGMA. The following subsections summarize the analyses above to provide evidence for this conclusion with respect to groundwater quality; summaries relevant to groundwater levels and supply are provided in Impact 4.4-3.

Significant and Unreasonable Seawater Intrusion

As explained above, the water quality in the Dune Sand, 180-FTE, and 400-Foot Aquifers is degraded from seawater intrusion and has been for decades. The capture zone that develops from the proposed slant wells would be located within this area of seawater intrusion. The pumping over the life of the project would change the local groundwater quality of the inland areas close to the slant wells and within the groundwater capture zone from the current brackish-to-saline quality to a higher salinity. The increase in salinity within this small area would occur because the slant wells would draw in the brackish water that is currently in the aquifer formation and seawater would flow in to replace it. This effect would only occur within the capture zone near the coast at the CEMEX site; areas outside of the capture zone would not be affected.

As shown in Figure 4.4-17, the MPWSP would reduce or reverse the inland advance of the seawater intrusion front. Thus, the MPWSP would facilitate the reduction of seawater intrusion in the long term, and would not result in significant and unreasonable seawater intrusion.

Significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies

The effects of the MPWSP on water quality relative to seawater intrusion are discussed above and demonstrate that the operation of the MPWSP would not adversely affect water quality. The radius of influence of pumping in the Dune Sand and 180-FTE Aquifers is expected to extend close to, but not overlap with, the contaminant plumes associated with the ongoing cleanup at the former Fort Ord. However, it is remotely possible that the radius of influence could reach and affect the contaminant plumes. Implementation of Mitigation Measure 4.4-4 would prevent the significant and unreasonable degradation of water quality due to the migration of contaminant plumes that impair water supplies.

Impact Conclusion for Groundwater Quality

For the slant wells, the seawater intrusion front would migrate back toward the ocean, which would be a less-than-significant impact. For the slant wells, the potential impact of interference with existing remediation systems would be reduced to less than significant with the implementation of Mitigation Measure 4.4-4. For the ASR injection/extraction wells, the net addition of injection water is considered a less than significant impact. For the ASR injection/extraction wells, the potential impact of interference with existing remediation systems would be less than significant. The operation of all other project facilities would have no impact on groundwater quality.

Therefore, for the proposed project as a whole, the potential operations impacts would be less than significant with mitigation, relative to groundwater quality.

Mitigation Measure

Mitigation Measure 4.4-4 applies only to the Subsurface Intake System.

> **Mitigation Measure 4.4-4: (Groundwater Monitoring and Avoidance of Impacts on Groundwater Remediation Plumes).**
>
> Prior to the start of MPWSP construction, CalAm shall incorporate the future quarterly groundwater elevation monitoring results for the OUCTP A-Aquifer and 180-Foot Aquifer (upper and lower) plumes into the well monitoring program described above in **Applicant**

Proposed Measure 4.4-3 until the two OUCTP plumes have been appropriately remediated and the RWQCB no longer requires remediation activities. Groundwater elevation data shall be obtained from the periodic monitoring reports developed by the U.S. Army and its contractors. The elements of the additions to the groundwater monitoring program proposed under this mitigation measure are described below.

- CalAm shall incorporate into its well monitoring program (described above for **Applicant Proposed Measure 4.4-3)**, the most recent monitoring reports available through the U.S. Army and its contractors for the monitoring wells that are necessary to characterize the flow direction and water quality of the three OUCTP plumes located in the A-Aquifer, the Upper 180-Foot Aquifer and the Lower 180-Foot Aquifer.
- The groundwater elevation results shall be evaluated by CalAm and its consultants on a quarterly basis to assess whether the -1-foot drawdown contour from the proposed subsurface intake system is approaching the edge of the OUCTP plumes. CalAm shall continuously coordinate with and include the U.S. Army in all pertinent correspondence during the groundwater data evaluation stages. If the analysis concludes that the slant well pumping could intersect or could influence the flow direction of the OUCTP plumes, then CalAm shall contact the U.S. Army, the Regional Water Quality Control Board – Central Coast Region, the California Department of Toxic Substance Control, and the U.S. EPA to initiate communications and develop and implement a plan to either stop or decrease the pumping to prevent any impact on the OUCTP plumes. In the unlikely event that an impact does occur, CalAm shall bear the necessary additional costs to address changes in the plume flow direction, arrest migration of the plumes, and/or to remediate areas of new contamination created by slant well pumping. CalAm shall consider using existing groundwater remediation and monitoring wells that remain on the site to expand the existing treatment systems.
- When the ongoing remediation of the OUCTP plumes has been completed and the RWQCB authorizes closure of the two OUCTP plumes remediation activities, this mitigation measure shall no longer apply.

Mitigation Measure 4.4-4 would monitor changes in the groundwater surface elevation caused by MPWSP pumping near the two OUCTP Plumes. If it is determined that MPWSP pumping could interfere with the Fort Ord plumes, this mitigation measure requires CalAm to take actions so the plumes do not expand and contaminate other areas, such as bearing the costs for work necessary to change the plume flow direction, arrest migration of the plumes, and/or to remediate areas of new contamination created by slant well pumping. This mitigation would reduce the impacts to less than significant.

4.4.6 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects.

Impact 4.4-C: Cumulative impacts related to Groundwater Resources. (*Less than Significant*)

The geographic scope of the cumulative analysis for groundwater resources includes portions of the SVGB and the SGB. Within the SVGB, it is the western half of the Pressure Area extending from the coast of the Monterey Bay to about Davis Road in Salinas and from Moss Landing south to the jurisdictional boundary of the Pressure Area and the SGB (**Figure 4.4-1**). The geographic scope within the SGB includes the entire basin as it is shown in **Figure 4.4-1**.

The geographic scope of this cumulative groundwater resources analysis must also include a vertical element because other projects could have a cumulative effect on the subsurface aquifers as well as the aquifer's areal distribution. This analysis includes as part of its geographic scope the underground aquifers in the SVGB and the SGB. In the SVGB, the aquifers of potential concern are the Dune Sand Aquifer, 180-FTE Aquifer, 180-Foot Aquifer (inland and east of CEMEX), and 400-Foot Aquifer. The NMGWM^{2016} did not project a groundwater response in the deeper aquifers (aka the 900-Foot Aquifer), therefore, it is not considered in the cumulative analysis. In the SGB, the aquifer of concern is the surficial shallow aquifer, which is in the unconfined Paso Robles Formation and the underlying confined Santa Margarita Sandstone.

Cumulative groundwater impacts would be significant if they would substantially deplete or interfere with groundwater supplies, violate water quality standards, or degrade water quality. This analysis evaluates cumulative impacts within the basins associated with the aquifer response to groundwater extraction and injection. The significance thresholds are applied to the physical effects from changes to the volume and quality of the groundwater. The surface infrastructure associated with the slant wells and the ASR wells, such as pipelines and pump stations, would not impact groundwater resources and is therefore not discussed further in this section.

Baseline conditions evaluated in the project-specific analysis in Section 4.4.5 reflect the contributions of past actions, including existing, operational projects that withdraw or return groundwater, on groundwater resources within the geographic scope. Therefore, the modeled timeframe considered for the cumulative analysis is the life of the project (approximately 60 years, see Section 4.4.4.2) plus two years to allow for aquifer recovery. Substantial quantities of groundwater would not be used or affected during the project construction phase; therefore, construction-phase effects are not addressed since the project's contribution to any cumulative effects would not be cumulatively significant in nature or extent (*less than significant*).

In determining the current and reasonably foreseeable projects within the SVGB, this analysis first considered those projects listed on **Table 4.1-2** that are water supply projects involving the construction, development and use of a large yield production well. The only project of this type was the Granite Ridge Water Supply Project (No. 33). This project proposes a 1,000 gallon per minute well, conveyance pipeline, and other infrastructure. However, this proposed project was not considered in the cumulative analysis because it is over 12 miles from the area of pumping influence of the MPWSP and therefore, outside the geographic scope of this analysis. The effects of groundwater pumping under the Granite Ridge Water Supply Project would not combine with the effects of the proposed MPWSP because these two projects are far enough apart and in two separate groundwater aquifer systems.

The second set of projects considered are those within the geographic scope (SVGB) and that have the potential to pump groundwater creating a cone of depression that could possibly coalesce with the area of pumping influence of the MPWSP. The projects in this category are: the Monterey Regional Waste Management District Truck Yard Facility Project (No. 55), the Landfill-Gas-to-Energy Facility Phased Capacity Improvements (No. 58), The Dunes on Monterey Bay (No. 7), the Regional Urban Water Augmentation Project (RUWAP) Recycled Water Project (No.35), the Regional Urban Water Augmentation Project (RUWAP) Desalination Element (No.31), the Marina Station (development project) (No. 12), and the CalAm Slant Test Well at CEMEX (No.47). It was determined that the only pertinent project in this category to address in the cumulative analysis would be the Regional Urban Water Augmentation Project (RUWAP) Desalination Element (No. 31), which is discussed below. The CalAm Slant Test Well at CEMEX has been previously analyzed and the MPWSP would incorporate the test slant well into its proposed slant well array. The other projects in this category would likely use municipal supplies and not require a water supply that depends on private groundwater extraction and would therefore not impact local or regional groundwater resources.

In determining the current and reasonably foreseeable projects within the SGB, this analysis considered those projects listed on **Table 4.1-2** that are located in the geographic scope (SGB) and could involve groundwater extraction or otherwise impact groundwater resources. The projects considered were the Salinas Valley Water Project Phase II (No. 1), the Seaside Resort (No. 16), the Monterey Bay Shores Resort (No. 19), Seaside Groundwater Basin Aquifer Storage and Recovery (Phase 1) (No. 29), Seaside Groundwater Basin Aquifer Storage and Recovery (Phase 2) (No. 30), and Pure Water Monterey Groundwater Replenishment (GWR) Project (No. 59). The existing Phase 1 and Phase 2 ASR Wells (Projects Nos. 29 and 30) are past projects that are therefore, included in the baseline. The development projects (Nos. 16 and 19) are expected to use municipal supplies and not require private groundwater extraction and thus are not considered in the cumulative analysis. The GWR project (No. 59) is not relevant to this analysis because if the GWR is implemented, CalAm would not need to construct a 9.6 mgd desalination plant (the proposed project); instead, it would construct the 6.4-mgd desalination plant described in Alternatives 5a and 5b. There are no known other present or reasonably foreseeable future cumulative projects identified in the Santa Margarita Sandstone of the SGB.

Based on the discussion above, the current and reasonably foreseeable future projects listed in **Table 4.1-2** that are within the geographic scope and have the potential to combine with the groundwater-related impacts of the proposed project are the Salinas Valley Water Project Phase II (No. 1), the Interlake Tunnel (No. 24), and the Regional Urban Water Augmentation Project (RUWAP) Desalination Element (No. 31). These projects are located within the SVGB.

The potential cumulative operations-phase groundwater resources impacts are discussed below.

Salinas Valley Water Project Phase II (No. 1)

The Salinas Valley Water Project Phase II would deliver additional surface water to the Pressure Area and East Side Area to offset pumping and help retard seawater intrusion. This would occur in the 180-Foot Aquifer and the 400-Foot Aquifer. Phase II would have a beneficial effect on the Pressure Area of the SVGB as it would curtail groundwater extraction and reduce stress on the groundwater aquifers. The MPWSP would draw seawater and brackish inland water from the western edge of the Pressure Area, which, over time, is expected to facilitate the retreat of the seawater intrusion front. If the MPWSP ultimately returns a portion of the desalinated product water to the basin as in-lieu groundwater recharge, then it would benefit the 400-Foot Aquifer by reducing groundwater pumping in the area underlying the CSIP and CCSD.

The MPWSP would capture about 400 afy of shallow groundwater that would otherwise discharge to the Salinas River and the Monterey Bay. The MPWSP’s 400 afy contribution would only amount to about 0.3 percent of the 135,000 afy diversion of groundwater that would otherwise enter the Salinas River proposed under Phase II, and would not result in a significant reduction in surface supply. Notwithstanding minor, potential cumulative reductions in Salinas River flows, Phase II and the MPWSP would have a cumulative beneficial effect on groundwater resources in the Pressure Area of the SVGB. Overall, Phase II and the MPWSP would have a cumulative beneficial effect on the SVGB.

Interlake Tunnel (No. 24)

The Interlake Tunnel Project would produce additional surface water storage and supply for downstream groundwater recharge and reduction of seawater intrusion in the SVGB. The MPWSP would, over the course of the project, contribute to retarding the advancement of seawater intrusion through groundwater pumping in the already intruded western portion of the Pressure Area. The MPWSP would also enhance groundwater supplies in the 400-Foot Aquifer if the proposed project ultimately returns water to the basin but if the MPWSP does not return water to the basin, the impact would be benign. Overall, once implemented, assuming water is returned by the MPWSP both projects would eventually contribute to a cumulative beneficial impact for groundwater supply and quality.

RUWAP Desalination Element (No. 31)

As explained in Table 4.1-2, it is not reasonably foreseeable that MCWD would implement its prior plan to build a 2,700 afy desalination plant at its Armstrong Ranch property. However, the planning effort involving MCWD, Fort Ord Reuse Authority (FORA), and MRWPCA will explore the most cost effective and technically efficient mix of potential water sources, one being desalination. The feasibility study could conclude that a smaller desalination plant, such as a plant producing 1,000 afy, could be a viable option to provide the 973 afy shortfall to support the FORA Base Realignment Plan (BRP). This cumulative impact discussion, therefore, assumes that desalination would be chosen as a preferred water supply option and a 1,000 afy plant would be proposed at the MCWD Armstrong Ranch property, with intake wells located along the coast south of the CEMEX site near Reservation Road.

The cones of depression created by MPWSP pumping in the Dune Sands Aquifer and 180-FTE Aquifer are depicted in **Figures 4.4-14** and **4.4-15**, respectively. As shown, the cones of depression, delimited by the -1-foot drawdown contour, would extend south up to 2 miles to include the MCWD Reservation Road property under all sea level and return water scenarios. The MPWSP would pump about ten times the amount of groundwater per day as a smaller (1,000 afy) MCWD plant and, thus, the area of influence from the MPWSP pumping would cover a larger area than the MCWD project. If the proposed MCWD project were also pumping near the coast, its cone of depression, expected to be smaller and more confined, would likely intersect or be encompassed by the cone of depression created by MPWSP pumping. When cones of depression from two or more pumping wells overlap, it causes what is referred to as well interference. Interference between pumping wells can create a combined drawdown effect where groundwater levels are lower than would be expected from the individual pumping wells. Typically, the combined drawdown of two or more wells is equal to the sum of the drawdowns caused by each well individually. Well interference between the slant wells at MPWSP and MCWD would cause a significant cumulative impact if groundwater levels were lowered in a nearby municipal or private groundwater production well such that the well would be damaged, yield would be substantially reduced, the well owner would be required to deepen or abandon the well, or if it would otherwise deplete groundwater in the SVGB, making it unavailable to other users.

If groundwater pumping for the MPWSP and the MCWD desalination plants were to happen simultaneously, it is reasonable to predict that the cones of depression from the two systems would be close enough to cause some degree of well interference and increased drawdown near the coast, between the CEMEX site and the MCWD property at Reservation Road. There are no operating groundwater production wells in this area. As discussed in **Impact 4.3-3**, current groundwater production in the MPWSP source aquifers is limited to minor irrigation and dust control. There are no groundwater water supply wells pumping potable water in this area, and most wells in this area are no longer active because of seawater intrusion.

With the operation of both the MPWSP and a desalination project at MCWD, the decline in groundwater levels due to well interference would not adversely affect operating groundwater production wells. The cumulative effect of the two projects would also not deplete the basin groundwater supply because the groundwater in this area is degraded by seawater intrusion and is unusable for potable water supply or irrigation use due to its high salinity. Additionally, with the MCWD desalination plant and the MPWSP operating simultaneously, there could be a combined beneficial effect because with the two projects, the capture zone for inland flowing seawater would expand to the south to extract more intruding seawater and aid in retarding the inland advance of the existing seawater intrusion front. The RUWAP desalination element and the MPWSP, if they were to be operated concurrently, would not result in a significant cumulative impact and could contribute to a less than significant beneficial effect to reduce seawater intrusion.

Because the MPWSP combined with the possible RUWAP desalination element would not result in a significant adverse cumulative impact and may have beneficial consequences, and the Salinas Valley Water Project Phase II and the Interlake Tunnel would have beneficial effects, the cumulative effect of these four possible projects on groundwater resources would be less than significant. Since there would be no adverse significant cumulative impact to which the project would contribute, the proposed project would not result in a significant cumulative impact during operations (*less than significant*).

References – Groundwater Resources

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4.5 Marine Biological Resources

This section analyzes the potential for the Monterey Peninsula Water Supply Project (MPWSP or proposed project), which includes 10 slant wells at CEMEX, to affect marine habitats and associated marine biological resources. The marine biological resources study area encompasses the nearshore waters (within 5 miles from shore) of Monterey Bay and extends from the Salinas River southward to the northern limits of Sand City. This area encompasses the ocean waters adjacent to the proposed subsurface slant wells site at the CEMEX sand mining facility and surrounding the Monterey Regional Water Pollution Control Agency's (MRWPCA) existing ocean outfall, which CalAm proposes to use to discharge the brine produced during the desalination process (see **Figure 4.5-1**). This area also includes the waters of Monterey Bay National Marine Sanctuary, and impacts associated with the federal proposed action, which includes the permitting and authorization of those project components that may affect sanctuary resources, including the brine discharge. This analysis considers construction and operational impacts associated with the subsurface slant wells and operational impacts associated with brine discharge because they are the only proposed actions that affect marine biological resources. The analysis of brine discharge impacts on marine biological resources relies on water quality information and analysis presented in Section 4.3, Surface Water Hydrology and Water Quality. Section 4.3 also discusses the indirect impacts on Marine Biological Resources resulting from the implementation of water quality mitigation. Marine birds, anadromous fish, and inland fish are addressed in Section 4.6, Terrestrial Biological Resources.

The CPUC received several comments pertaining to marine biological resources during the public review period for the April 2015 Draft EIR. Comments requested revision of the description of National Marine Sanctuary Program Regulations; and expansion of the discussion of state regulations to provide a more complete description of the Marine Life Protection Act and the Marine Life Management Act, as well as management plans for nearshore fishes and market squid. These comments have been addressed in Section 4.5.2, Regulatory Framework. Other comments include suggested revisions to the analysis approach and significance thresholds for analysis brine discharge impacts. Accordingly, the approach and significance thresholds have been revised and are presented in Sections 4.5.4 and 4.5.5. Comments received on the April 2015 Draft EIR expressed concerns over the potential for hypoxia[1] to occur near the seabed as a result of proposed MPWSP operational discharges. Specifically, there was concern that high salinity discharges from the MRWPCA outfall would restrict oxygen supply near the seabed and result in stress or mortality to benthic organisms and other marine biological resources. These issues are addressed in detail in Chapter 4.3, Water Quality, specifically Section 4.3.5.2 under Impact 4.3-4 and Impact 4.3-5, and a summary of this analysis is repeated in 4.5. Some commenters requested more quantitative analysis of shear stress effects on plankton associated with brine discharges and consideration of brine discharge impacts on squid. These issues are addressed under Impacts 4.5-4, 4.5-5, and 4.5-6. Finally, a concern was expressed regarding the presence of cold water offshore seeps. Although cold water seeps are one of the more unique and sensitive benthic habitats that occurs within Monterey Bay, they are located at depths greater than 3,000 feet (1,000 meters). There are no known cold water seeps within the study area and this topic is not further discussed.

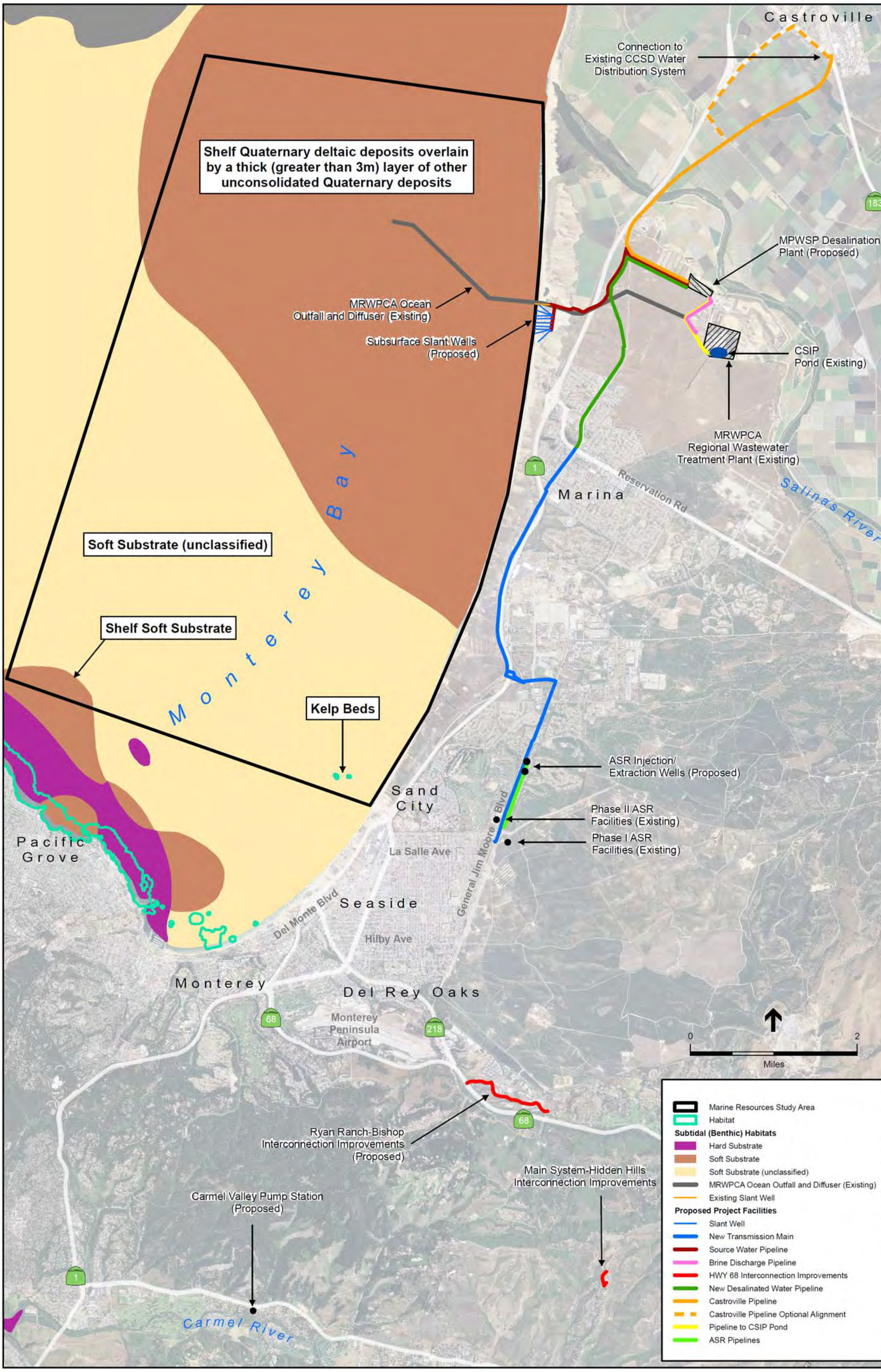
As a result of comments received on the January 2017 Draft EIR/EIS, revisions have been made to this Final EIR/EIS section. Those changes include:

- *The addition of California Division of Fish and Wildlife "Fully Protected" as a category of Special Status Marine Species; and*
- *The inclusion of additional brine discharge dilution modeling scenarios from Section 4.3, Surface Water Hydrology and Water Quality.*

4.5.1 Setting/Affected Environment

This setting section describes the regional oceanographic conditions and marine biological resources of Monterey Bay within Monterey Bay National Marine Sanctuary (MBNMS), and provides more specific information on habitats and resources in the study area. The impact analysis presented in Section 4.5.5, below, focuses on those resources located within the marine biological resources study area (**Figure 4.5-1**). The information on marine communities, plant and animal species, and sensitive biological resources used in the preparation of this section was obtained from regional databases including information available from MBNMS (MBNMS, 2013; 2015a, b; 2016a, b, c, d, e) environmental impact assessments prepared for other regional projects (MCRMA, 2014, SWCA/MBNMS, 2014), and scientific publication articles relevant to

[1] Hypoxia, or oxygen depletion, is an environmental phenomenon where the concentration of dissolved oxygen in the water column decreases to a level that can no longer support living aquatic organisms. The impacts of hypoxia are often described as creating a so-called "dead zone" in the marine environment.



SOURCE: CSUM; NOAA

205335.01 Monterey Peninsula Water Supply Project

Figure 4.5-1
Identified Seafloor Habitats in Study Area

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the proposed project, and reconnaissance-level surveys of the project area. A survey of marine plankton was performed on May 5, 2016 (AMS, 2016).

The study area is located in the nearshore coastal area of MBNMS, which was designated as a federally protected area in 1992. MBNMS is managed by the National Oceanographic and Atmospheric Administration (NOAA), Office of National Marine Sanctuaries (ONMS) and includes coastal waters from Marin to Cambria. MBNMS includes 276 statute miles of shoreline, extends an average distance of 30 miles from shore (MHWL) and encompasses 4,601 square nautical miles of ocean (MBNMS, 2015a). It was established for the purposes of research and monitoring, education and outreach, public use and resource protection, and includes a variety of habitats that support highly productive biological communities.

MBNMS resources include a variety of habitats that support extensive marine life, including 36 species of marine mammals, over 180 species of seabirds and shorebirds, at least 525 fish species, four sea turtle species, 31 different invertebrate phyla, and over 450 species of marine algae. Its natural resources include central California's largest contiguous kelp forest, one of North America's largest underwater canyons, and the closest-to-shore deep ocean environment off the continental United States. Its productive biological communities host one of the highest levels of marine biodiversity in the world, including 27 federally listed threatened and endangered species.

4.5.1.1 Existing Oceanographic Conditions

Monterey Bay has three ocean climate seasons: upwelling, oceanic, and Davidson current (Pennington and Chavez, 2000). The upwelling period, typically occurs mid-February through November, and is characterized by higher nutrient concentrations at the surface, where sunlight and stratification of the water column often lead to high primary production and chlorophyll values (see the discussion of pelagic habitat, below, for more details). MBNMS represents one of four major coastal upwelling regions worldwide. The seasonal upwelling makes Monterey Bay extremely productive in terms of being able to support a variety of species, including some whales and small schooling fish (e.g., sardine, herring).

During the oceanic period, which usually begins in mid-August and continues through mid-October, phytoplankton blooms are intermittent and primarily composed of small phytoplankton. Phytoplankton productivity is lowest in winter months and during the Davidson current period. Section 4.3, Surface Water Hydrology and Water Quality, provides more detail about the hydrology and water quality of Monterey Bay.

4.5.1.2 Existing Marine Habitats and Communities

The study area includes a variety of habitats that can be broadly divided into nearshore, pelagic (open water), and benthic (seafloor) habitats, as described in the following subsections.

Intertidal & Nearshore Habitats

The intertidal zone is located between the highest and lowest tide elevations. Intertidal zones along the central California coast include rocky shores, sandy beaches, coastal marshes, and tidal flats located within estuaries and lagoons. The intertidal zone adjacent to the project area is characterized by sandy beaches.

Sand and gravel beach communities are structured in part by grain size, slope of the beach, and wave energy. Intertidal beach communities are also subject to daily tidal changes that result in highly fluctuating physical regimes in temperature, salinity, and moisture content of the sand.

Various invertebrate animals live in the sand and in wracks of decaying seaweed and other detritus. These include crustaceans, cirolanid isopods, and mole crabs (Oakden and Nybakken, 1977). Polychaete worms, bivalves (i.e. clams, mussels, and scallops) are also regularly present, though typically in low abundances. In addition, there are numerous species of shorebirds that use the sandy beaches in the project area to feed at the water's edge, such as sanderling, marbled godwit, and willet. Western snowy plover is a protected species that nest on these same beaches. Marine mammals, including California sea lions, harbor seals, and elephant seals, haul out on isolated beaches and sands spits. Southern sea otters (*Enhydra lutris nereis*) forage for crustaceans and bivalves in the surf zone during high tide. Sand dollars, worms, clams, crabs, and a variety of fish, including multiple species of surfperch, flatfish, rays, and sharks, inhabit or utilize the surf zone.

Pelagic (Open Water) Habitat

The pelagic habitat supports planktonic organisms that float or swim in the water, as well as fish, marine birds, and marine mammals. Monterey Bay has a high level of phytoplankton primary production[2] due to annual seasonal upwelling. Phytoplankton, the primary producers in the marine pelagic food web, are consumed by many species of zooplankton. In turn, the zooplankton supports a variety of species, such as small schooling fish (e.g., sardine, herring) and baleen whales (*Mysticeti*).

Seasonal blooms of phytoplankton regularly occur in Monterey Bay (Pennington and Chavez, 2000) when optimal conditions for each species (e.g. temperature, nutrient concentrations, salinity) develop. Some phytoplankton species, such as the dinoflagellate (*Cochlodinium*), produce toxins and can cause harmful algal blooms when they reproduce to very high densities (Kudela et al., 2008; Shahraki et al, 2013). A diatom (*Pseudo-nitzschia*) produces domoic acid, a neurotoxin that can bioaccumulate in the food chain and result in mortality in marine mammals, birds, and humans. This diatom is regularly associated with harmful algal blooms in Monterey Bay (Armstrong-Howard et al, 2007; Kudela et al, 2005).

Common zooplankton in Monterey Bay include small shrimp-like invertebrates (crustaceans) of the order Euphausiacea commonly known as krill. Large aggregations of euphausiids often precede the arrival of blue whales that come to feed on crustaceans at the edge of the Monterey Bay Submarine Canyon. Euphausiids feed on phytoplankton that grow after nutrient rich water has upwelled to the surface. Euphausiid species typically present in these groups are *Euphausia pacifica, Thyanoessa spinifera,* and *Nyctiphanes simplex* (Croll et al., 2005).

2 Phytoplankton primary production refers to the growth rate of the phytoplankton community.

Small zooplankton was sampled near the MRWPCA outfall in the spring of 2016, to provide an example of the assemblages that could be affected by the proposed discharge of desalination brine (AMS, 2016). Three oblique tows (at the diffuser, 0.3 mile [0.5 kilometer] north of the diffuser, and 0.3 mile [0.5 kilometer] south of the diffuser) were made perpendicular to shore to bracket the water depth of the diffuser using a net with a 1-meter opening and net mesh of 202 µm. Calanoid copepods and euphausiid crustaceans were the most abundant organisms observed in sorted subsamples (see **Table 4.5-1**). Various crustacean, polychaete, and molluscan larvae and other small zooplankton were also observed. When total counts were normalized to volume, abundances ranged from 77 to 176 individuals per cubic foot (or 2,702 to 6,202 individuals per cubic meter), with an overall average of 123 individuals per cubic foot (4,357 individuals per cubic meter).

TABLE 4.5-1
ZOOPLANKTON COLLECTED NEAR THE MRWPCA OUTFALL IN MAY 2016

Station	CALAM-1 North of Diffuser	CALAM-2 Over the Diffuser	CALAM-3 South of Diffuser	Overall
Date	**14 May 2016**	**14 May 2016**	**14 May 2016**	
Time	**10:05**	**10:59**	**11:39**	
Wire out (m)	**99**	**100**	**62**	
Taxonomic Group (#/m^3)				**Mean #/m^3**
Copepod_unid	88.47	0.00	12.72	33.73
Calanoid	3,025.59	1,918.70	4,213.87	3,052.72
Oithona_sp	253.61	207.32	648.61	369.85
Corycaeus_sp	5.90	81.05	105.98	64.31
Copepod_nauplii	76.67	3.77	152.61	77.69
Euphausiid_nauplii	23.59	5.65	12.72	13.99
Euphausiid_Calyptopis	837.49	275.18	729.16	613.94
Euphausiid_furcilia	117.96	65.97	55.11	79.68
Cirripedia_nauplii	11.80	16.96	12.72	13.83
Cladocera_podon	0.00	0.00	8.48	2.83
Salp	159.24	45.23	33.91	79.46
Appendicularia_unid	41.28	5.65	127.18	58.04
Oikopleura_unid	23.59	9.42	8.48	13.83
Chaetognath_unid	23.59	35.81	29.68	29.69
Polychaete_unid	0.00	5.65	8.48	1.97
Polychaete_trocophore	0.00	3.77	4.24	4.71
Gastropod_larvae	0.00	5.65	4.24	2.67
Bivalve_veliger	0.00	3.77	8.48	4.40
Siphonophore	0.00	0.00	21.20	3.30
Hydromedusa	0.00	0.00	4.24	4.08
Sum	4,706.47	2,702.76	6,202.10	4,357.11

SOURCE: AMS, 2016

The nearshore phytoplankton and zooplankton communities of Monterey Bay support a diverse group (over 80 species) of fishes, sharks, and rays. These include flatfish such as halibut, sanddab, flounder, turbot, and sole that are closely associated with sandy habitats, as well as surfperch, rockfish, goby, and sculpin, which are normally associated with rocky habitats. Pelagic schooling fishes include Northern Anchovy (Engraulis mordax), Pacific Herring (Clupea pallasii), smelts (Osmeridae), Pacific Sardine (Sardinops sagax), and New World silversides (Atherinopsidae). The close proximity of the Monterey Bay Submarine Canyon to the shoreline means that certain fish, sharks, and marine mammals that would normally exist predominantly in deeper offshore waters can also be frequent inhabitants of the nearshore pelagic environment.

Market squid *(Doryteuthis (Loligo) opalescens*) inhabit the pelagic habitat in Monterey Bay and supports a major commercial fishery in the area, as well as providing a key food source for marine mammals, birds, and fish. Between 2009 and 2014, commercial landings of market squid in Monterey Bay ranged between 2.3 million and 90.4 million pounds annually with an average annual landing of 43.1 million pounds (CDFW, 2016a).

Market squid adults typically inhabit deeper offshore waters but return to shallower nearshore areas to spawn on sand and mud seafloor habitats. Peak spawning in Monterey Bay occurs in April. Squid larvae and juveniles inhabit the nearshore coastal waters of the study area (Porzio and Brady, 2006).

Monterey Bay has one of the most diverse and abundant marine mammal assemblages in the world with up to six species of seals and sea lions, 20 species of whales, dolphins, and porpoises, and one species of sea otter potentially occurring within the study area (MBNMS, 2016a). The most common seals and sea lions observed in the study area include the Pacific harbor seal (*Phoca vitulina*), California sea lion (*Zalophus californianus*), and the northern elephant seal (*Mirounga angustirostris*). Although any of these species can haul out on the sandy beaches or rocky intertidal breakwalls at Moss Landing Harbor, there are no known haul out areas for these species within the study area (MBNMS, 2016a).

The most commonly observed cetaceans (whales) within the study area include the humpback whale (*Megaptera novaengliae*), California gray whale (*Eschrichtius robustus*), the blue whale (*Balaenoptera musculus*), and occasionally the Minke whale (*Balaenoptera acutorostrata*). Other whale species that occur within Monterey Bay but are rarely or infrequently observed in the nearshore waters of the study area include the fin, sperm, North Pacific right, Sei, killer, and Baird's beaked whales. The most commonly observed dolphins and porpoises in the study area of Monterey Bay include the common dolphin (*Delphinus spp*.), bottlenose dolphin (*Tursiops truncates*), Pacific white-sided dolphin (*Lagenorhynchus obliguidens*), and Risso's dolphin (*Grampus griseus*). Additionally, while harbor porpoises (*Phocena phocena*) are frequently observed in the nearshore waters adjacent to Sunset Beach to the north of the study area, they are infrequently observed in the study area. Other dolphin and porpoise species present in the study area do not utilize nearshore waters or occur very infrequently; these include Dall's porpoise, Northern right whale dolphin, and striped dolphin. Southern sea otter (*Enhydra lutris nereis*) inhabits the nearshore waters of Monterey Bay and the study area using Elkhorn Slough in Elkhorn Slough National Estuarine Research Reserve as a pupping area (MBNMS, 2016a).

Benthic (Seafloor) Habitats

Two seafloor or benthic habitat types occur in the study area (see **Figure 4.5-1**): soft substrate and hard substrate, which comprise the benthic habitat or submerged lands of MBNMS.

Soft Substrate (Mud & Sand) Habitat

The soft substrate habitat in the study area has been characterized as a flat featureless plain with a gently sloping sandy seafloor (Eittreim et al., 1997). This soft substrate habitat consists primarily of deltaic deposits from the Salinas River and other unclassified soft substrate. Physical processes, such as waves and currents, sort the sediment particles roughly by grain size so that there are onshore-offshore gradients in the fineness of sediments, with coarser sand deposits closer to shore grading to muddy areas farther offshore (Edwards et al., 1997). The seafloor habitat located within the high-energy surf zone is characterized by coarse, mobile sands and contains a limited range and abundance of species commonly including flatfish, rays, shrimp, crabs, sand dollars, amphipods, clams, and large polychaete worms (Edwards et al., 1997). Offshore, the seafloor sediment gradually changes to a finer mud composition with increasing percentages of silts and clays, as a result of decreasing wind-driven wave energy. As a result of the increased organic and silt/clay composition of the seafloor sediments, and decreased energy, the associated invertebrate and fish communities commonly inhabiting these areas increase substantially over the nearshore surf zone. The infaunal marine community typically consists of multiple species of polychaete and oligochaete worms, amphipods, cumaceans, isopods, ostracods, mollusks, decapods, gastropods, and ophiuroides. Common megabenthic epifauna include anemones, crabs, shrimp, gastropod snails, echinoderm sea stars, and sea pens. Many different fish species spend all or part of their life cycle in association with the seafloor. These species include flatfish, gobies, poachers, eelpouts, and sculpins, which all live in close association with the benthos during their subadult and adult life. Others, such as salmon, steelhead, smelt, sturgeon and other fish species, use the benthos for foraging.

This habitat area typically extends throughout most of the Monterey Bay with associated species composition and abundance changing gradually with depth. This habitat is not as physically dynamic as the nearshore sandy habitat and is normally not subject to large fluctuations in water quality parameters like salinity and temperature. However, this region is still subject to wave and current action, which sorts bottom sediments and removes organic material.

Hard Substrate Habitat

Rocky areas along the central California coast provide habitat for a diverse group of organisms. More than 660 marine algae and kelp species are present in the rocky habitats of central California (Abbott and Hollenberg, 1976). Kelp forests occur in rocky subtidal areas and provide abundant microhabitats by virtue of their vertical structure. Kelp forests are capable of providing sufficient primary productivity (rate of formation of energy-rich organic compounds) to sustain the entire ecosystem. The growth requirements for kelp include light, relatively cool water, and high nutrients (primarily nitrates, phosphates, and some metals). In addition to macrophytes like giant kelp (*Macrocystis pyrifera*) and bull kelp (*Nereocystis* spp.) that anchor on hard substrate, highly diverse invertebrate and fish assemblages also inhabit rocky areas. These include multiple species of bryozoans, anemones, shrimp, ectoprocts, solitary and branching corals, hydrocorals, sponges, scallops, crabs, tubeworms, tunicates, and fish, including rockfish (*Sebastes*), sculpins, lingcod, and greenlings.

NOAA, as part of their coastal marine resource mapping efforts (NOAA, 2014a), indicates on one of their sensitivity index maps the potential presence of a small area of rocky subtidal habitat supporting kelp at the very southern end of the study area (see **Figure 4.5-1**). Additionally, hard substrate subtidal habitat has been identified (MBNMS, 2016d) that coincides with the ballast rock that is used to secure the MRWPCA outfall on the seabed (see **Figure 4.5-2**). As described above, the majority of the study area is soft bottom substrate and there are no SESAs in the study area. Video obtained during a recent inspection of the MRWPCA outfall revealed a rich hard-substrate assemblage on the ballast rock. Numerous species of rockfishes, sea cucumbers, anemones, solitary cup corals, and sponges were observed (Ballard Marine Construction, LLC, 2014).

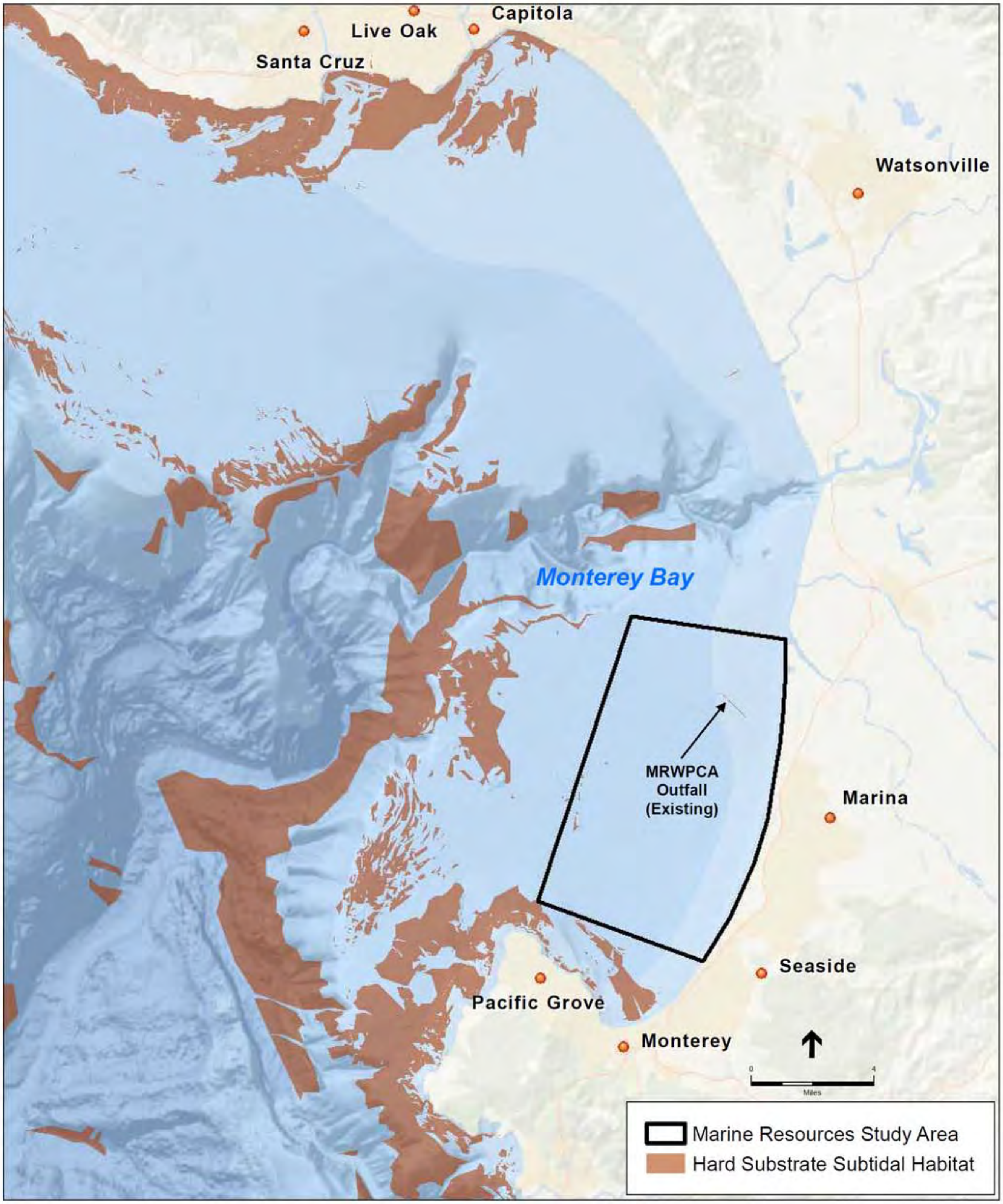
Submarine Canyons

A major feature of Monterey Bay is the system of submarine canyons that incise the coastal shelf. Monterey Canyon, whose head is close to shore near Moss Landing, is similar in size to the Grand Canyon (MBNMS, 2016f) with a maximum rim to floor relief greater than 5,500 feet. Soquel Canyon, much smaller than Monterey Canyon, begins offshore of Soquel and intersects with the northern rim of Monterey Canyon. The canyon walls are a mixture of soft substrate and rocky outcrops and support a very diverse biota of benthic organisms, such as corals, sea pens, tunicates, sponges, and crinoids, and fishes. Krill, a major prey item for many cetaceans, also exist in high concentrations along canyon walls and near canyon heads. None of the canyons in Monterey Bay are located within the study area.

4.5.1.3 Special-Status Marine Species

The high phytoplankton productivity of Monterey Bay and Elkhorn Slough supports numerous special-status mammals, birds, turtles, and fish. Special-status species include those species that are listed as federal or state endangered, threatened, proposed, and candidate species; and state or local species of concern. For the purposes of this analysis, special-status marine species include:

- Marine species that are listed or proposed or are candidate species for listing as Threatened or Endangered by the USFWS and NMFS pursuant to the Federal Endangered Species Act (FESA);
- Marine species listed as Rare, Threatened, or Endangered by CDFW pursuant to the California Endangered Species Act (CESA);
- Marine species managed and regulated under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act or MSA);
- Marine species protected under the Marine Mammals Protection Act (MMPA);
- Marine species managed and regulated by CDFW under the Nearshore Fisheries Management Plan and the Market Squid Fisheries Management Plan;



SOURCE: NOAA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.5-2

Hard Substrate Subtidal Habitat in Monterey Bay

- Marine species designated by CDFW as California Species of Concern and Fully Protected; and
- Marine species not currently protected by statute or regulation but considered rare, threatened, or endangered under CEQA (Guidelines Section 15380).

Table 4.5-2 presents the FESA, CESA, and MMPA marine species in Monterey Bay and their potential to occur within the study area. The special-status marine species that have the highest risk of being adversely affected by project construction and operational activities because of their presence within the study area are discussed below. **Table 4.5-3** presents marine fish and invertebrate species that are managed and regulated under the MSA and **Table 4.5-4** presents marine fish and invertebrates that are managed under the California Nearshore Fisheries Management Plan (NFMP) and the California Market Squid Fisheries Management Plan (MSFMP), that occur within the study area.

FESA, CESA, and MMPA Species

Mammals

The special-status marine mammals that are most likely to be present within the resource study area, within MBNMS, identified in **Table 4.5-2**, include the southern sea otter, humpback whale, California gray whale, common long-beak dolphin, bottlenose dolphin, California sea lion, and Pacific harbor seal. Southern sea otter predominantly inhabits nearshore environments, where it dives to the seafloor to forage on predominantly marine invertebrates such as sea urchins, mollusks, crustaceans, and fish. Humpback and blue whales are found throughout Monterey Bay and tend to concentrate in areas with abundant krill or anchovies where they can be observed feeding. Bottlenose and the common long-beak dolphin are the two most frequently observed marine mammals in the shallower coastal waters of the study area. They are year-round inhabitants often observed in moderate-sized groups. Harbor porpoise are shy and harder to observe, yet they also have resident populations in the area. Harbor seals and California sea lions are also routinely observed within the study area, although usually as single individuals. No haul outs for either species are known to occur within the study area, although individuals can and do haul out temporarily on the beaches within the study area. The California gray whale, although no longer a federal and State-listed species, is one of the most commonly observed whales in Monterey Bay. Similarly, the federally endangered humpback whale has become a common sight within Monterey Bay between April and December when migrating through the region.

Additional species of marine mammals are known to be present in Monterey Bay either year-round or seasonally, but are not likely to occur or rarely occur in the study area.

Birds

One special-status marine bird occurs in the study area. The California western snowy plover (*Charadrius alexandrinus nivosus*) and other marine and terrestrial birds potentially inhabiting the study area are discussed in Section 4.6, Terrestrial Biological Resources.

TABLE 4.5-2
SPECIAL-STATUS MARINE SPECIES AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Listing Status	Habitat	Regional Occurrence	Potential to Occur in Study Area
Marine Mammals					
Southern Sea Otter	*Enhydra lutris nereis*	FT, P, FP	A top carnivore in its coastal range and a keystone species of the nearshore coastal zone. Frequent inhabitor in kelp forests.	Year-round-Common	**High.** Otters are commonly found in Monterey Bay and the nearshore waters within the study area.
California Sea Lion	*Zalophus californianus*	P	Coastal waters of Monterey Bay are used for foraging with haul-out sites near Fishermen's Wharf; most abundant pinniped in MBNMS.	Seasonal-Common	**Moderate.** Main haul-out sites are located south of the study area; however, foraging can be expected to occur over the entire continental shelf.1
Steller Sea Lion	*Eumetopias jubatus*	FT, P	Occasional visitor in fall and winter utilizing the coastal waters of Monterey Bay for foraging, usually found among the California sea lions on the Coast Guard jetty in Monterey harbor.	Seasonal-Occasional	**Not Expected.** A small population breeds on Año Nuevo Island, just north of Monterey Bay and occasional individuals transit through MBNMS waters but no sightings within the study area have been reported.[1]
Harbor Seal	*Phoca vitulina richardii*	P	Most commonly observed pinniped along MBNMS coastline. Use the offshore waters of Monterey Bay for foraging and beaches for resting. Occur on offshore rocks, on sand and mudflats in estuaries and bays, and on some isolated beaches.[1]	Year-round-Common	**High.** Residents of MBNMS throughout the year, occurring mainly close to shore.
Northern Fur Seal	*Callorhinus ursinus*	FD	Usually come ashore in California only when debilitated, however, few individuals observed on Año Nuevo Island. Occur off of central California during winter following migration from northern breeding grounds.	Seasonal-Very Rare	**Not Expected.** Usually 18-28 km from shore in California, however, they have been observed within 5 km of Point Pinos to the south of the study area.[1]
Northern Elephant Seal	*Mirounga angustirostris*	FP, P	Usually observed offshore swimming and foraging and only come ashore in Monterey Bay when debilitated or at one of the established rookeries. Three rookeries are on mainland beaches in MBNMS at Pt. Piedras Blancas, Cape San Martin/Gorda, and Año Nuevo State Park.	Year-round, Common	**Low.** Northern elephant seals are widely distributed in MBNMS but have a low probability of occurring in the study area. They are sighted regularly over shelf, shelf-break, and slope habitats and they are also present in deep ocean habitats seaward of the 2000 m isobaths. Rookeries are located to the north and south of the study area.
Guadalupe Fur Seal	*Arctocephalus townsendi*	CT, FT, FD, FP	Breed along the eastern coast of Guadalupe Island, approximately 200 Kilometers west of Baja California. In addition, individuals have been sighted in the southern California Channel Islands, including two males who established territories on San Nicolas Island. Guadalupe fur seals have been reported on other southern California islands, and the Farallon Islands off northern California with increasing regularity since the 1980s and only occasional observed foraging and swimming in the waters of Monterey bay.	Seasonal-Very Rare	**Not Expected to Low.** This species is not known to regularly haul out or breed in the study area, but occasionally individuals have been sighted in MBNMS waters or have stranded on beaches located within the study area.[1]

TABLE 4.5-2 (Continued)
SPECIAL-STATUS MARINE SPECIES AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Listing Status	Habitat	Regional Occurrence	Potential to Occur in Study Area
Marine Mammals (cont.)					
Harbor Porpoise	*Phocoena phocoena*	P	Observed in shallow sandy bottom areas of the Monterey Bay Shelf where they forage.	Year-round-Common	**Low.** Although the main population is located offshore Sunset Beach State Park to the north of the study area, individuals have been reported in the nearshore waters adjacent to the former Fort Ord military base.[2]
Risso's Dolphin	*Grampus griseus*	P	Generally found in waters greater than 1,000m in depth and seaward of the continental shelf and slopes.	Year-round-Very Rare	**Not Expected.** An increase in the number of Risso's dolphins in MBNMS has occurred since 1973; however, they generally occur in deeper waters offshore of the study area.[3]
Common Dolphin – Long-beaked	*Delphinus capensis*	P	Found relatively close to shore swimming and foraging.	Year-round-Common	**High.** The common dolphin is the most abundant cetacean found in the coastal waters of California, and the abundance within MBNMS has increased in recent years.[3]
Common Dolphin – Short-beaked	*Delphinus delphis*	P	A more pelagic species than the long-beaked common dolphin, they utilize Monterey Bay for foraging.[3]	Year-round-Rare	**Not Expected.** Generally found offshore of the study area.
Dall's Porpoise	*Phocoenoides dalli*	P	The most pelagic of the porpoises in MBNMS, they utilize Monterey bay for foraging.	Year-round-Rare	**Not Expected.** Most frequently seen off of Point Pinos and over the Monterey Canyon, both of which are outside of the study area.[3]
Bottlenose Dolphin	*Tursiops truncatus*	FD	Includes coastal and offshore populations. Both species use the waters of Monterey Bay for foraging.	Year-round-Common	**Moderate.** More than 45 individuals have been sighted during one recent survey. This species is now considered a resident of Monterey Bay, and is confined to occur within one km of shore.[3]
Pacific White-sided Dolphin	*Lagenorhynchus obliquidens*	P	Commonly seen near the shelf break in the offshore waters of Monterey Bay.	Year-round Common	**Not Expected - Low.** This had been the most frequently seen dolphin in Monterey Bay but has recently been replaced by the common dolphin. Occurs primarily within 15km west of Carmel Bay to the south of the study area and within 25km southwest of Santa Cruz to the north of the study area.[3]
Northern Right Whale Dolphin	*Lissodelphis borealis*	P	Deep, cold temperate waters over the continental shelf and slope in offshore Monterey Bay.	Year-round-Rare	**Low.** Most frequently seen south of MBNMS. Abundance of this species appears to have increased since 1973.[3]
Minke Whale	*Balaenoptera acutorostrata*	P	Can be in coastal/inshore and oceanic/offshore areas of Monterey bay.	Year-round-	**Low-Moderate**. Numerous sightings in the nearshore waters of Monterey Bay. Sightings are usually of single individuals.[3]

TABLE 4.5-2 (Continued)
SPECIAL-STATUS MARINE SPECIES AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Listing Status	Habitat	Regional Occurrence	Potential to Occur in Study Area
Marine Mammals (cont.)					
Blue Whale	*Balaenoptera musculus*	FE, FD	In Monterey Bay, blue whales often occur near the edges of the submarine canyon where krill tends to concentrate. Blue whales feed only on krill and are in Monterey Bay between June and October, during times of high krill abundance. Blue whales begin to migrate south during November.	Seasonal-Common	**Low.** Regularly observed in Monterey Bay but mostly in deeper waters.
Humpback Whale	*Megaptera novaeangeliae*	FE, FD	Central California population of humpback whales migrates from their winter calving and mating areas off Mexico to their summer and fall feeding areas off coastal California. Humpback whales occur in Monterey Bay from late April to early December.	Seasonal-Common	**Moderate.** Observed throughout Monterey Bay.
Fin Whale	*Balaenoptera physalus*	FE, FD	More common farther from shore; occasionally encountered during the summer and fall in Monterey Bay.	Seasonal-Common	**Not Expected.** Due to their occurrence mainly farther offshore in deeper waters, it is not likely they would be seen in the study area.
Sperm Whale	*Physeter macrocephalus*	FE, FD	Occur in many open oceans; live at the surface of the ocean but dive deeply to catch giant squid.	Seasonal-Rare	**Not Expected.** Offshore but mostly in deeper waters.
Gray Whale	*Eschrichtus robustus*	FDL, P	Predominantly occur within the nearshore coastal waters of Monterey Bay. This species has been delisted under FESA but remains protected under MMPA.	Seasonal-Common	**High.** Occurring in coastal waters during late fall-winter southward migration and again late winter to early summer during their northward migration.
Killer Whale	*Orcinus orca*	P	Transient species observed throughout coastal California waters. Presence and occurrence can be common but unpredictable.	Seasonal-Common	**Low.** Most common during April, May, and June as they feed on northbound migrating gray whales. Generally observed in the deeper waters offshore of the study area.
North Pacific Right Whale	*Eubalaena glacialis*	FE, FD, FP	Seasonally migratory; inhabit colder waters for feeding, and then migrate to warmer waters for breeding and calving. Although they may move far out to sea during their feeding seasons, right whales give birth in coastal areas.	Seasonal-Very Rare	**Not Expected.** Sightings in MBNMS are very rare.[4]
Sei Whale	*Balaenoptera borealis*	FE, FD	Sighted in offshore waters throughout the latitudinal range of MBNMS, though usually occur seaward of the sanctuary's western boundary. Observed generally in deep water habitats including along the edge of the continental shelf, over the continental slope, and in the open ocean.	Seasonal-Very Rare	**Not Expected.** Sightings have become rare in MBNMS since the 1980s.[5]
Short-finned Pilot Whale	*Globicephala macrorhynchus*	P	Found primarily in deep waters in warmer tropical and temperate waters. Forage in areas with high densities of squid.	Year-round-Very Rare	**Not Expected.** Generally found in deeper water than that in the study area.
Baird's Beaked Whale	*Berardius bairdii*	FD	Inhabit deep offshore waters in the North Pacific.	Seasonal-Very Rare	**Not Expected.** Sightings in the fall in Monterey Bay and in deeper waters than the study area.

TABLE 4.5-2 (Continued)
SPECIAL-STATUS MARINE SPECIES AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Listing Status	Habitat	Regional Occurrence	Potential to Occur in Study Area
Marine Mammals (cont.)					
Cuvier's Beaked Whale	*Ziphius cavirostris*	P	Deep pelagic waters (usually greater than 1,000m deep) of the continental shelf and slope. Seasonality and migration patterns are unknown.[6]	Seasonality unknown-Very Rare	**Not Expected.** Generally occur in the deeper waters west of the study area. Infrequent strandings in Monterey Bay.
Marine Turtles					
Leatherback Sea Turtle	*Dermochelys coriacea*	FE	Offshore pelagic environment.	Seasonal-Occasional	**Low.** Leatherback sea turtles are most commonly seen between July and October, when the surface water temperature warms to 15-16° C and large jellyfish, the primary prey of the turtles, are seasonally abundant offshore.
Green Sea Turtle	*Chelonia mydas*	FE	Primarily use three types of habitat: oceanic beaches (for nesting), convergence zones in the open ocean, and benthic feeding grounds in coastal areas.	Seasonal-Rare	**Low.** In the eastern Pacific, green turtles have been sighted from Baja California to southern Alaska but most commonly occur from San Diego south.
Olive Ridley Sea Turtle	*Lepidochelys olivacea*	FT	Mainly a "pelagic" sea turtle, but has been known to inhabit coastal areas, including bays and estuaries.	Seasonal-Very Rare	**Not Expected.** In the eastern Pacific, the range of the Olive Ridley turtle extends from southern California to northern Chile.
Loggerhead Sea Turtle	*Caretta caretta*	FT	Occupy three different ecosystems during their lives: the terrestrial zone, the oceanic zone (> 100 fathoms water depth), and the neritic one (< 100 fathoms water depth).	Seasonal-Very Rare	**Low.** In the U.S., most recorded sightings are of juveniles off the coast of California but occasional sightings are reported along the coasts of Washington and Oregon.
Fish					
Chinook Salmon (winter-run)	*Oncorhynchus tshawytscha*	CE, FE	Anadromous and semelparous. This means that as adults, they migrate from a marine environment into the fresh water streams and rivers of their birth (anadromous) where they spawn and die (semelparous).	Seasonal	**Moderate.** Chinook salmon are normally entering the Sacramento River from November to June and spawning from late-April to mid-August, with a peak from May to June. They inhabit nearshore coastal waters of Central California throughout the year, but especially during migration time.
Chinook Salmon (Central California Evolutionary Significant Unit)	*Oncorhynchus tshawytscha*	FT, CSC	Juveniles may spend from 3 months to 2 years in freshwater before migrating to estuarine areas as smolts and then into the ocean to feed and mature. They prefer streams that are deeper and larger than those used by other Pacific salmon species.	Seasonal	**Low.** Historically, the range extended from Oregon to the Ventura River in California, but presently does not appear to extend very far south of San Francisco Bay but into Monterey Bay. Chinook salmon in this ESU exhibit an ocean-type life history and use Monterey Bay waters for foraging.

TABLE 4.5-2 (Continued)
SPECIAL-STATUS MARINE SPECIES AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Listing Status	Habitat	Regional Occurrence	Potential to Occur in Study Area
Fish (cont.)					
Coho Salmon (Central California Evolutionary Significant Unit)	*Oncorhynchus kisutch*	CT, FT	Spend approximately the first half of their life cycle rearing and feeding in streams and small freshwater tributaries. Spawning habitat is small streams with stable gravel substrates. The remainder of the life cycle is spent foraging in estuarine and marine waters of the Pacific Ocean.	Seasonal	**Low to Moderate.** Historically, there was a run in the Pajaro and Salinas Rivers but not since the 1990s. Current runs exist in Waddell Creek, Scott Creek, San Lorenzo River, Soquel Creek, and Aptos Creek. In Monterey County, the only runs are two small runs in the Carmel and Big Sur Rivers.
Steelhead (South Central California Coast Distinct Population Segment)	*Onchorhynchus mykiss*	FT, CSC	Steelhead are anadromous and can spend up to 7 years in fresh water prior to smoltification, and then spend up to 3 years in salt water prior to first spawning.	Seasonal	**Low to Moderate.** This DPS occupies rivers from the Pajaro River in Santa Cruz County to (but not including) the Santa Maria River in Santa Barbara County.
Tidewater Goby	*Eucycloglobius newberryi*	FE	Despite the common name, this goby inhabits lagoons formed by streams running into the sea. The lagoons are blocked from the Pacific Ocean by sandbars, admitting salt water only during particular seasons, and so their water is brackish and cool. The tidewater goby prefers salinities of less than 10 parts per thousand (ppt) (less than a third of the salinity found in the ocean) and is thus more often found in the upper parts of the lagoons, near their inflow.	Seasonal	**Low.** Seasonally present in Elkhorn Slough, Bennet Slough, and Salinas River, all of which are outside of the study area.
Western River Lamprey	*Lampetra ayresi*	CSC	Rivers for spawning and rearing; nearshore marine and estuarine habitat as adults. Adult river lampreys enter the ocean in late spring, spending 3-4 months in salt water where they exhibit rapid growth.[8,9]	Seasonal-Very Rare	**Not Expected to Low.** Uncommon in California and potentially in decline.
North American green sturgeon, Southern Distinct Population Segment (DPS)	*Acipenser medirostris*	FT	Within the marine environment, the Southern DPS occupies coastal bays and estuaries from Monterey Bay to Puget Sound in Washington. Individuals occasionally enter coastal estuaries to forage. All of Monterey Bay is designated Critical Habitat for green sturgeon.	Seasonal	**Low.** There are very few data on green sturgeon presence in coastal waters. This species may forage in or near the project area but its distribution in ocean waters is essentially unknown. Spawning occurs in the upper Sacramento River for the southern DPS and fish are known to frequent coastal waters < 110 meters.[16] In 2006, an individual was entrained at the Moss Landing Power Plant intake. No other sightings or reported presence in other entrainment and fish studies have indicated a more than occasional presence.

**TABLE 4.5-2 (Continued)
SPECIAL-STATUS MARINE SPECIES AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA**

Common Name	Scientific Name	Listing Status	Habitat	Regional Occurrence	Potential to Occur in Study Area
Fish (cont.)					
White sharks	*Carcharodon carcharias*	CSC	In California, important white shark habitat occurs around Monterey Bay and Greater Farallones, national marine sanctuaries. White shark populations are impacted by purposeful and incidental capture by fisheries, marine pollution, and coastal habitat degradation	Year-round	**Moderate to High.** Present in coastal waters throughout the State and juveniles and adults are known to frequent the nearshore coastal waters along Monterey Bay coastline.
Eulachon	*Thaleichthys pacificus*	FT	Spawning and rearing in estuarine river habitat; migrate to saltwater where they spend three years and then return to river spawning locations.	Seasonal-Very Rare	**Low.** Monterey Bay is at the southernmost limit of this species distribution, and the population is in decline.[10]
White Sturgeon	*Acipenser transmontanus*	CSC	Live in estuaries of large rivers, but migrate to spawn in freshwater and often travel long distances between river systems.	Seasonal-Very Rare	**Low.** Exist in salt water from the Gulf of Alaska south to Ensenada, Mexico, but spawning only occurs in a few large rivers from the Sacramento-San Joaquin system northward. Self-sustaining spawning populations are currently only known in the Fraser (British Columbia), Columbia (Washington), and Sacramento (California) rivers.[11]
Longfin Smelt	*Spirinchus thaleichthys*	CT	Spend the majority of their life cycle in brackish to marine waters and migrates upstream to freshwater to spawn. A pelagic species.	Seasonal-Very Rare	**Not Expected.** A single longfin smelt collected from the Monterey Bay area was reported by Eschmeyer et al. (1983) but the San Francisco Bay-Delta population is considered to be the southernmost population for the species (Moyle 2002).[12]
Cowcod	*Sebastes levis*	CSC	Juveniles recruit to fine sediment habitat in Monterey Bay in late summer. They have been observed at depths between 40 and 100m. Young cowcod move to deeper habitat within their first year.[13,14]	Seasonal-Common	**Moderate.** Juveniles documented on soft-bottom habitat in study area.
Basking Shark	*Cetorhinus maximus*	CSC	This species movements and migrations are poorly understood. Usually sighted from British Columbia to Baja California in the winter and spring months; where they go once they leave coastal areas is unknown.	Seasonal-Very Rare	**Low.** Basking shark populations were severely depleted by commercial fisheries of the 1950s, and they have never fully recovered due to slow growth and low fecundity.[15]

TABLE 4.5-2 (Continued)
SPECIAL-STATUS MARINE SPECIES AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Listing Status	Habitat	Regional Occurrence	Potential to Occur in Study Area
Marine Invertebrates					
Black Abalone	*Haliotis cracherodii*	FE	Coastal and offshore island intertidal habitats on exposed rocky shores where bedrock provides deep, protective crevices for shelter.	Year-round-Very Rare	**Not Expected.** Study area is not designated as critical habitat due to the lack of preferred habitat (rocky intertidal vs. fine- to medium-grained sand beaches of Monterey Bay).[7] Could be present on hard substrate areas to the north and south of the study area.

NOTES:

FESA = Federal Endangered Species Act
MMPA = Marine Mammal Protection Act
CESA = California Endangered Species Act

Potential for Species Occurrence Rankings:
Not Expected - Suitable foraging or spawning habitat is not known to be present and the species has not been documented to occur
Low - Suitable foraging or spawning habitat is present, but the species has either not been documented to be present or if present, the presence is infrequent
Moderate - Suitable foraging or spawning habitat is present and the species has been documented to be present for part of the year
High - Suitable foraging or spawning habitat is present and the species has been documented to be present throughout the year and/or in substantial numbers

STATUS CODES:

Federal: National Oceanographic and Atmospheric Administration (NOAA); MMPA
FD = Depleted Population
P = Federally Protected

Federal: U.S. Fish and Wildlife Service (USFWS), NOAA National Marine Fisheries Service (NMFS); FESA
FDL = Delisted
FE = Listed as “endangered” (in danger of extinction) under FESA
FT = Listed as “threatened” (likely to become Endangered within the foreseeable future) under FESA
FC = Candidate to become a proposed species
FSC = Former “federal species of concern”. The USFWS no longer lists Species of Concern but recommends that species considered to be at potential risk by a number of organizations and agencies be addressed during project environmental review. *NMFS still lists “Species of Concern”.

State: California Department of Fish and Game (CDFG); CESA
CE = Listed as “endangered” under the CESA
CT = Listed as “threatened” under the CESA
FP = State fully protected species
CSC = CDFW designated “species of special concern”

SOURCES: KLI, 2005; CDFG, 2001; MBNMS, 2015a; NOAA, 2014a; CSUMB, 2014. [1]Monterey Bay National Marine Sanctuary (MBNMS), 2016a; [2]Sanctuary Integrated Monitoring Network (SIMoN), 2016a; [3]MBNMS, 2016b; [4]SIMoN, 2016b; [5]SIMoN, 2016c; [6]National Oceanic and Atmospheric Administration (NOAA), 2016a; [7]NOAA, 2011b; [8]California Department of Fish & Wildlife (CDFW), 2015a; [9]Burton & Lea, 2013; [10]Gustafson, RG, 2016; [11]CDFW, 2015b; [12]The Bay Institute (TBI) et al., 2007; [13]Love & Yoklavich 2008; [14]Johnson et al., 2001; [15]PSRF, 2016.

TABLE 4.5-3
FISH SPECIES PRESENT IN MONTEREY BAY MANAGED UNDER MAGNUSON-STEVENS ACT

Fisheries Management Plan	Common Name	Scientific Name	Life Stages Present	Potential to Occur in Study Area
Coastal Pelagic	Northern anchovy	*Engraulis mordax*	L, J, A[1]	High
	Pacific sardine	*Sardinops sagax*	L, J, A[1]	Moderate-High
	Jack mackerel	*Trachurus symmetricus*	J, A[1]	Moderate-High
	Pacific mackerel	*Scomber japonicus*	L, J, A[1]	Moderate-High
	Pacific herring	*Clupea pallasi*	L, J, A	Moderate-High
	Market squid	*Doryteuthis (Loligo) opalescens*	L, J, A[1]	Moderate-High, when in season
Pacific Groundfish	English sole	*Parophrys vetulus*	L, J, A[2]	High
	Sand sole	*Psettichthys melanostictus*	L, J, A[1]	Moderate-High
	Rock sole	*Pleruonectes bilineatus*	J, A	Moderate-High
	Butter sole	*Pleuronectes isolepsis*	J, A	Moderate-High
	Pacific sanddab	*Citharichthys sordidus*	L, J, A[1]	Moderate-High
	Starry flounder	*Platichthys stellatus*	L, J, A[3]	Low-Moderate
	Diamond turbot	*Hypsopsetta guttulata*	A	Moderate-High
	Ratfish	*Hydrolagus colliei*	J, A	Moderate-High
	Lingcod	*Ophiodon elongatus*	L, J, A[4]	Low-Moderate
	Brown rockfish	*Sebastes auriculatus*	L, J, A[5]	Low-Moderate
	Kelp rockfish	*Sebastes atrovirens*	L, J, A	Low-Moderate
	Aurora rockfish	*Sebastes aurora*	L	Moderate-High
	Gopher rockfish	*Sebastes carnatus*	L, J, A	Low-Moderate
	Splitnose rockfish	*Sebastes diploproa*	L, J[6]	Low-Moderate
	Yellowtail rockfish	*Sebastes flavidus*	A	Moderate-High
	Shortbelly rockfish	*Sebastes jordani*	L, J[7]	Low-Moderate
	Black rockfish	*Sebastes melanops*	L, J, A[8]	Low-Moderate
	Black and yellow rockfish	*Sebastes chrysomelas*	L, J, A[9]	Very Low
	Blue rockfish	*Sebastes mystinus*	L, J, A[10]	Low
	Boccacio	*Sebastes paucispinis*	L, J, A	Low
	Grass rockfish	*Sebastes rastrelliger*	L, J, A[11]	Low
	Stripetail rockfish	*Sebastes saxicola*	L, J	Low-Moderate
	Juvenile & larval rockfish	*Sebastes spp.*	J, L	Low-Moderate
	Leopard shark	*Triakis semifasciata*	J, A[1]	Low-Moderate, when in season
	Spiny dogfish	*Squalus acanthias*	A, J,	Moderate-High
	Soupfin shark	*Galeorhinus zyopterus*	J, A	Low-Moderate
	Big skate	*Raja binoculata*	J, A	Low-Moderate
	California skate	*Raja inornata*	J, A	Low-Moderate
	Longnose skate	*Raja rhina*	J, A	Low-Moderate[12]
	Cabezon	*Scorpaenichthys marmoratus*	L, J, A	Moderate-High
Pacific Coast Salmon	Chinook salmon	*Oncorhynchus tshawytscha*	J, A	Moderate-High, when in season
	Coho salmon	*Oncorhynchus kisutch*	J, A	Moderate-High, when in season
Highly Migratory Species	Common thresher shark	*Alopias vulpinus*	J, A	Low-Moderate
	Shortfin mako shark	*Isurus oxyrinchus*	J, A	Rare, Present in waters deeper than 600 feet
	Albacore tuna	*Thunnus alalunga*	J, A	Moderate-High
	Northern bluefin tuna	*Thunnus orientalis*	J	Rare, Present in waters deeper than 600 feet

NOTES:
Life Stages- A = Adult, J = Juvenile, L = Larvae

SOURCES: [1]Tenera, 2014; [2]Boehlert & Mundy, 1987; [3]PFMC, 2005; [4]Allen, 2014; [5]NOAA, 2014b; [6]NOAA, 2016b; [7]Lenarz, 1980; [8]Miller & Shanks, 2004; [9]SIMoN, 2016d; [10]CDFG, 2001; [11]ODFW, 2016; [12]Driscoll, 2014.

TABLE 4.5-4
SPECIES MANAGED UNDER THE MAGNUSON-STEVENS FISHERIES MANAGEMENT PLAN AND CALIFORNIA NEARSHORE FISHERIES MANAGEMENT PLAN AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Habitat	Regional Occurrence	Potential to Occur in Study Area
Market Squid	*Doryteuthis opalescens*	Pelagic. Adults migrate inshore to spawn over sand habitats and larvae generally occur inshore.	Year-round-Common	**Moderate.** The range of market squid is from the southern tip of Baja California, Mexico to southeastern Alaska. In central California spawning activity starts around April and ends in October. Adults occur in the upper 100m of the water column at night.[1]
Black Rockfish	*Sebastes melanops*	Occur in loose schools 10-20 ft above shallow, rocky reefs, but individuals may also be found resting on rocky bottoms or schooling in mid-water over deeper reefs. Larvae are pelagic, Young-of-year (YOY)[3] settle nearshore in shallower portions of kelp beds, and adults inhabit mid-water and pelagic areas over high relief rocky reefs.	Year-round-Rare	**Low.** Not common south of Santa Cruz.[2]
Black-and-Yellow Rockfish	*Sebastes chrysomelas*	Bottom-dwelling, generally in water less than 60 ft. Inhabit kelp beds and rocky reefs. Larvae and young juveniles are pelagic, but juveniles eventually settle on nearshore rocky areas or in kelp forests.	Year-round-Common	**Moderate.** Distributed from Eureka, California to Isla San Natividad, Baja California, but they are less common south of San Diego.[2]
Blue Rockfish	*Sebastes mystinus*	Larvae are pelagic. In spring, YOY appear in the kelp canopy, shallow rocky areas, and nearshore sand-rock interfaces. Adults inhabit the mid-water and pelagic areas around high-relief rocky reefs, the kelp canopy, and artificial reefs.	Year-round-Common	**High.** Distributed from the Bering Sea to Punta Banda, Baja California, from surface waters to a maximum depth of 1,800 ft. Most abundant rockfish in central California kelp beds.[2]
Brown Rockfish	*Sebastes auriculatus*	YOY migrate into bays and estuaries, which they use as nursery habitat (primarily in waters less than 175 ft deep). They may remain in higher salinity areas of bays for 1 to 2 years before returning to the open coast. Typically associated with sand-rock interfaces, rocky bottoms of artificial or natural reefs, and in eelgrass beds. In shallow areas they are associated with rocky areas and kelp beds, while in deeper water they stay near the rocky bottom.	Year-round-Common	**Moderate.** Distributed from southeast Alaska to Hipolito Bay, central Baja California. San Francisco Bay appears to be an important habitat.[2]
Cabezon	*Scorpaenichthys marmoratus*	Typically occur nearshore from the intertidal to 335 ft. As they get older and larger they tend to move to deeper water. Found in subtidal habitats in or around rocky reefs, under kelp beds, and in shallow tide pools.	Year-round-Common	**Moderate.** Distributed from Point Abreojos, Baja California to Sitka, Alaska.[2]

3 YOY – Young of Year. i.e., newly hatched juveniles.

TABLE 4.5-4 (Continued)
SPECIES MANAGED UNDER THE MAGNUSON-STEVENS FISHERIES MANAGEMENT PLAN AND CALIFORNIA NEARSHORE FISHERIES MANAGEMENT PLAN AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Habitat	Regional Occurrence	Potential to Occur in Study Area
Calico Rockfish	*Sebastes dallii*	Found in areas of soft sand-silt sediment and on artificial reefs, from 60 to 840 ft deep. Adults inhabit rocky shelf areas where there is a mud-rock or sand-mud interface with fine sediments. Associated with areas of high and low relief.	Year-round-Common	**Moderate.** Distributed from Sebastian Viscaino Bay, Baja California to San Francisco.[2]
China Rockfish	*Sebastes nebulosus*	Larvae and early juveniles are pelagic, but larger juveniles and adults settle on rocky reefs or cobble substrate, generally at depths between 30 and 300 ft.	Year-round-Rare	**Low.** Distributed from Kachemak Bay, northern Gulf of Alaska to Redondo Beach and San Miguel Island in southern California, but are most abundant from southeastern Alaska to Sonoma County, California.[2]
Copper Rockfish	*Sebastes caurinus*	Found in the shallow subtidal to 600 ft. New recruits associate with surface-forming kelp. Juveniles settle to the bottom on rocky reefs and well as sandy areas. Adults are commonly found in kelp bed areas but also occur on deeper rocky reefs.	Year-round-Common	**Moderate.** Distributed from the northern Gulf of Alaska to central Baja California.[2]
Gopher Rockfish	*Sebastes carnatus*	Larvae and juveniles are pelagic, but as juveniles mature they settle on rocky reefs or into the kelp canopy. Adults are residential and bottom-dwelling, associated with kelp beds, rocky reefs, or sandy areas near reefs, from the intertidal to about 260 ft.	Year-round-Common	**Moderate.** Distributed from Eureka, California to San Roque, central Baja California, but are most common from Mendocino County, California to Santa Monica Bay.[2]
Grass Rockfish	*Sebastes restrelliger*	Shallow-water species, commonly found from the intertidal to 20 ft. Juveniles are pelagic, but adults are associated with kelp beds and reefs. Usually only juveniles are found in tide pools.	Year-round-Common	**Moderate.** Distributed from Yaquina Bay, Oregon to Bahia Playa Maria, central Baja California, although they are most commonly found from northern California south.[2]
Kelp Greenling	*Hexagrammos decagrammus*	Found in the intertidal to 500 ft, but are most common at depths of 150 ft or less. Found in subtidal habitats in or around rocky reef areas and under kelp beds. Juveniles and adults are common on any rocky bottom area with dense algal growth.	Year-round-Common	**Moderate.** Distributed from La Jolla, California to the Aleutian Islands in Alaska.[2]
Rock Greenling	*Hexagrammos lagocephalus*	Juveniles and adults are found in subtidal habitats in or around rocky reef areas and in kelp beds.	Year-round-Common	**Low.** Distributed from the Bering Sea to Point Conception. In California, this species is infrequently observed south of San Francisco.[2]
Kelp Rockfish	*Sebastes atrovirens*	Occur in rocky reef and artificial reef areas, but most commonly found in kelp beds, drifting within the kelp blades. Occur at depths up to 150 ft, but most often found at depths between 15 and 50 ft.	Year-round-Common	**High.** Distributed from Timber Cove, northern California to Punta San Pablo, central Baja California. Most abundant between northern Baja and central California.
Monkeyface Prickleback	*Cebidichthys violaceus*	Rocky areas with crevices, including high and low intertidal tide pools, jetties and breakwaters, and relatively shallow subtidal areas, particularly kelp beds. Juveniles are well adapted for high-intertidal areas. Occur from the intertidal to 80 ft in depth.	Year-round-Common	**Moderate.** Distributed from San Quintin Bay, Baja California to southern Oregon.[2]

TABLE 4.5-4 (Continued)
SPECIES MANAGED UNDER THE MAGNUSON-STEVENS FISHERIES MANAGEMENT PLAN AND CALIFORNIA NEARSHORE FISHERIES MANAGEMENT PLAN AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Habitat	Regional Occurrence	Potential to Occur in Study Area
Olive Rockfish	*Sebastes serranoides*	Larvae and planktonic. YOY settle out of the plankton onto kelp beds, oil platforms, surfgrass. Occur from surface waters to about 396 ft.	Year-round-Common	**Moderate.** Distributed from southern Oregon to Islas San Benitos, central Baja California. Common from Cape Mendocino to Santa Barbara.[2]
Quillback Rockfish	*Sebastes maliger*	Larvae are planktonic. YOY settle out of the plankton onto shallow, low-relief rocky substrate and shallow, vegetated habitats such as kelp and eelgrass beds. Juveniles also inhabit the very nearshore seafloor and are found over both low- and high-relief rocky substrate. Adults are found in deeper water in close association with the bottom, perched on rocks or taking shelter in crevices.	Year-round-Rare	**Low.** Distributed from the Gulf of Alaska to San Miguel Island in southern California. Common between southeast Alaska and northern California.[2]
California Scorpionfish	*Scorpaena guttata*	Live in tide pools and to depths of about 600 ft. Very young scorpionfish live in shallow water in habitats with dense algae and bottom-encrusting organisms. Juveniles and adults are common on hard bottom such as rocky and artificial reefs.	Year-round-Rare	**Low.** Distributed from Santa Cruz, California south along the coast of Baja California and into the Gulf of California. Common as far north as Santa Barbara.[2]
California Sheephead	*Semicossyphus pulcher*	Inhabit nearshore rocky reefs, kelp beds, and surfgrass beds. Appear to prefer areas of high and low relief but have also been observed foraging over sandy bottom habitat. Use rock crevices and holes to sleep.	Year-round-Rare	**Low.** Distributed form Monterey Bay, California south into the Gulf of California. Not common north of Point Conception.[2]
Treefish	*Sebastes serriceps*	Found drifting in mats of kelp in areas of high rocky relief and on artificial reefs. Adult treefish are found on rock reefs, often in caves and crevices. Occur in shallow habitats to 150 ft in depth.	Year-round-Common	**Moderate.** Distributed from Cedros Island, Baja California to San Francisco.[2]

NOTES
[a] STATUS:
FE=Federally Endangered, SE= State Endangered, FT=Federally Threatened, ST=State Threatened, SSC= Species of Special Concern, FDL=Federally Delisted
[b] POTENTIAL TO OCCUR:
Not Expected = Not expected to occur. No suitable habitat within marine biological resources study area; study area outside currently known distribution or elevation range; no nearby documented occurrences or nearby documented occurrences are historical only.
Low = Low potential to occur: Potentially suitable habitat highly limited and/or of marginal quality; potentially suitable habitat present but species not documented nearby.
Moderate = Moderate potential to occur: Low to moderate quality habitat present; species documented in the study area.
High = High potential to occur: High quality suitable habitat present within study area; species documented in the project vicinity.

SOURCES: [1]CDFG. 2005, [2]CDFG. 2002.

Turtles

Special-status marine turtles that have a very low probability of occurring seasonally in the study area include the leatherback sea turtle (*Dermochelys coriacea*), green sea turtle (*Chelonia mydas*), olive ridley sea turtle (*Lepidochelys olivacea*), and loggerhead sea turtle (*Caretta caretta*). Leatherback sea turtles are federally endangered and most commonly seen in Monterey Bay from July to October. Green sea turtles, olive ridley sea turtles, and loggerhead sea turtles are federally threatened species rarely seen in Monterey Bay. NOAA has designated all of Monterey Bay as leatherback sea turtle critical habitat (NOAA, 2016c). The leatherback, green and loggerhead turtles have a low potential to occur within the study area; and the olive ridley turtle is not expected to occur within the study area.

Fish

The special-status fish with the highest probability of occurring in the study area are Chinook salmon (*Oncorhynchus tshawytscha*), Coho salmon (*Onchorhynchus kisutch*), Steelhead (*Onchorhynchus mykiss*), Cowcod (*Sebastes levis)*, green sturgeon (*Acipenser medirostris*), and white shark (*Carcharodon carcharias*). Chinook salmon, depending on the run, is State endangered or threatened, federally endangered or threatened and has a low to moderate potential to occur in the study area. Coho salmon is a State and federally threatened species that has a low to moderate potential to occur in the study area. South-Central California Coast Steelhead Distinct Population Segment is a federally threatened species and a State species of special concern that has a low to moderate potential to occur in the study area. Green sturgeon is a federal threatened species and State species of concern that has a low potential to occur in the study area.

The tidewater goby (*Eucyclogobius newberryi*) is federally endangered and occurs seasonally in Elkhorn Slough and can be flushed out into the ocean during tidal events. Juvenile cowcod rockfish, a California species of special concern, are known to inhabit the shallower waters of the study area. Historically, due to pressures of fisheries mortality, loss of prey due to overharvesting, disease, predation, and habitat degradation linked to contaminants, white shark numbers had declined in the Northern Pacific. In 2013, NMFS[4] determined that recent information is consistent with a stable or increasing white shark population. In 2014, CDFW determined that based on the best available science, listing the Northeastern Pacific population of white shark as a threatened or endangered species is not warranted, yet take of white shark is still prohibited in the recreational and commercial fisheries.

Managed Fish Species

Under the Magnuson-Stevens Conservation and Management Act (discussed in Section 4.5.2, Regulatory Framework, below), NMFS, the Fishery Management Councils, and all federal agencies are required to cooperatively protect “essential fish habitat” for commercially important fish species such as Pacific coast groundfish, three species of salmon, and five species of coastal pelagic fish and squid. Essential Fish Habitat includes waters and substrates that support fish spawning, breeding, feeding, and maturation. Fish species found in the coastal waters of Monterey Bay and in Elkhorn Slough are protected by Federal Fishery Management Plans prepared by regional Fishery

4 NMFS, 2013

Management Councils under the Magnuson-Stevens Act are listed in **Table 4.5-3**. All of the coastal waters of Central California and Monterey Bay are identified as Essential Fish Habitat for fish identified in the Pacific coast groundfish, salmon and coastal pelagic fisheries management plans under MSA. **Figures 4.5-3** Rockfish Conservation Area and **4.5-4** Essential Fish Habitat illustrate areas designated by NOAA as MSA managed groundfish and essential fish habitat for rockfish, respectively.

Commercial landings in the Monterey Bay ports (Monterey, Moss Landing, and Santa Cruz) indicate that in 2012 the major fish and invertebrates commercially harvested in Monterey Bay include northern anchovy, grenadier, California halibut, Pacific mackerel, assorted rockfish including blackgill, splitnose, and chillipepper, sablefish, Chinook salmon, white seabass, Pacific sardine, staghorn sculpin, sanddab, longnose skate, Dover sole, petrale sole, longspine thornyhead, shortspine thornyhead, albacore tuna, Dungeness crab, spot prawn, and squid (CDFW, 2013).

The most commonly landed recreational sport fishes in 2013 in central California and Monterey Bay were barred surfperch, assorted rockfish, including brown, black, copper, kelp, gopher, vermillion, yellowtail, and blue, calico surfperch, California lizardfish, Chinook salmon, Pacific mackerel, jacksmelt, northern anchovy, Pacific sanddab, silver surfperch, striped seaperch, walleye surfperch, sharks, and Dungeness crab (RECFIN, 2014).

4.5.1.4 Existing Marine Environment at the Proposed Intake and Outfall Locations

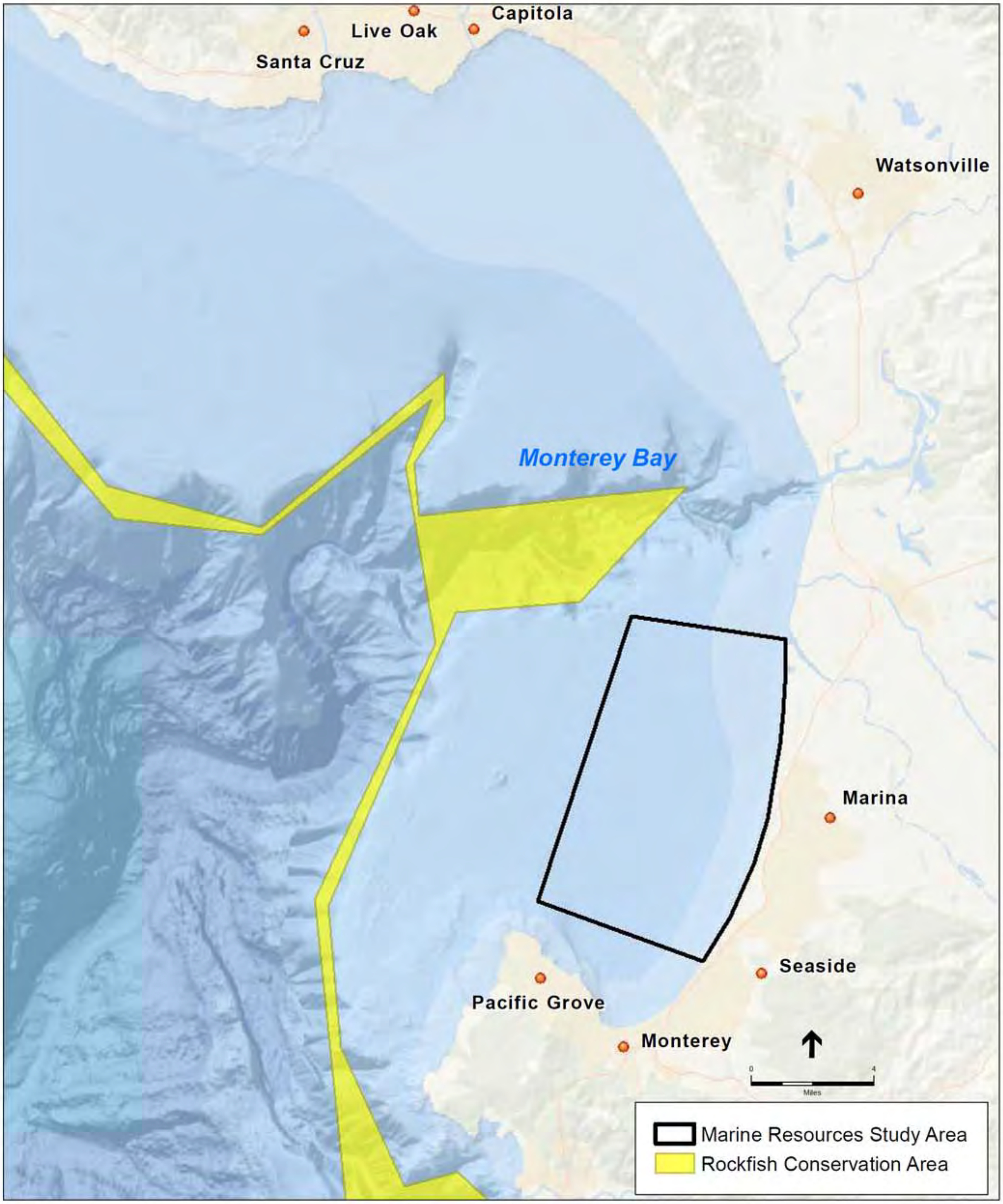
Many marine organisms inhabit either the surface (i.e., epifaunal) or reside within (i.e., infaunal) seafloor sediments. In particular, two communities are organized along a gradient of wave-induced substrate motion that is observed from San Diego to Washington:

- **Crustacean zone:** this shallower zone, characterized by strong water motion and sandy sediments, is occupied by small, mobile, deposit-feeding crustaceans, including sand-burrowing amphipods and surface-active cumaceans and ostracods. All can burrow into the loosely consolidated superficial sediments and flourish in wave-disturbed sand bottoms.
- **Polychaete zone:** characterized by more stable, fine sand with a significant amount of mud, this deeper zone is dominated by polychaete worms living in relatively permanent tubes and burrows. Many other relatively sessile[5] and suspension-feeding groups are also common here.[6]

The width and depth limits of these two zones vary, depending on the strength of wave activity. Benthic fishes are less abundant in the crustacean zone than the polychaete zone. Fish diversity on the sandy seafloor is relatively low compared to adjacent hard substrate areas.

The subsurface slant wells would terminate within the crustacean zone. The MRWPCA's existing ocean outfall and diffuser are in the polychaete zone. The marine communities inhabiting these zones are discussed in more detail below.

5 Sessile = of an organism, e.g., a barnacle, fixed in one place; immobile.
6 Zone descriptions from MBNMS, 2016g.

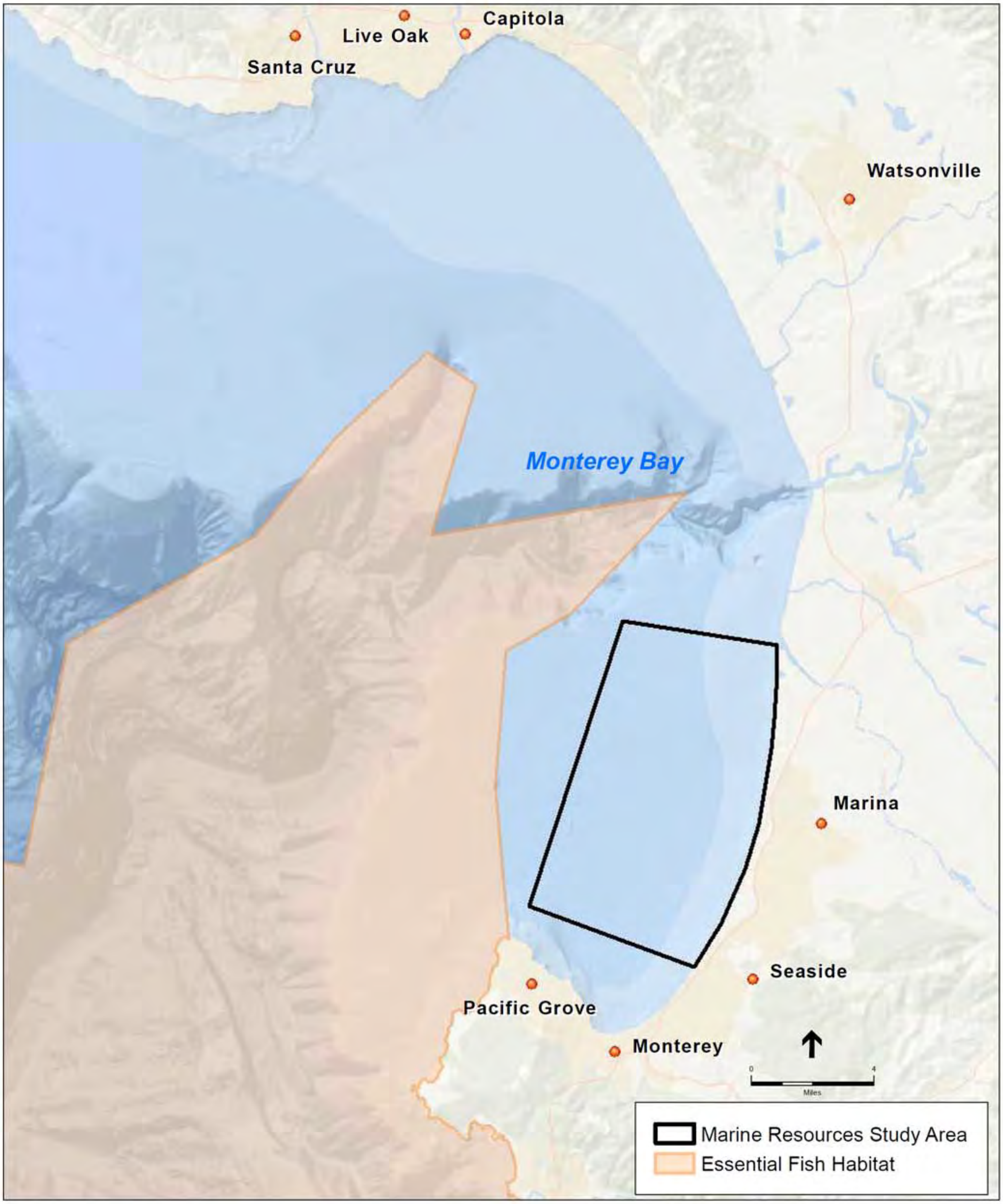


SOURCE: NOAA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.5-3

Rockfish Conservation Areas Designated in MBNMS under Federal Regulations



SOURCE: NOAA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.5-4
Essential Fish Habitat Designated in MBNMS under Federal Regulations

Proposed Subsurface Slant Wells

The subsurface slant wells would be drilled from roughly 900 feet inland of the shore and would extend beneath the coastal dunes and sandy beach, terminating 161 to 356 feet seaward of the MHW line, within the submerged lands of MBNMS, (except #8, which would not extend past the MHW line) in the nearshore zone at an estimated depth of 200 to 220 feet below MHW (190 to 210 feet beneath the seafloor).

Coastal dune habitat is described in detail in Section 4.6, Terrestrial Biological Resources. The intertidal beach area adjacent to the slant well locations is inhabited by crustaceans, cirolanid isopods, and mole crabs (Oakden and Nybakken, 1977). Polychaete worms, and bivalves (i.e. clams, mussels, and scallops) are also regularly present, though typically in low abundances. In addition, there are numerous species of shorebirds that use these beaches such as sanderling, marbled godwit, and willet that feed at the water's edge, and western snowy plover, a protected species that nest on these same beaches.

The high-energy surf zone is predominantly populated by sand dollars, polychaete worms, shrimp and other arthropods, clams, crabs, and a variety of fish, including multiple species of surfperch, flatfish, rays, and sharks. Marine mammals that may utilize the waters of the surf zone include California sea lions and Pacific harbor seals. Southern sea otters also forage for crustaceans and bivalves in the surf zone during high tide.

Existing MRWPCA Ocean Outfall for Brine Discharges

The habitat surrounding the existing MRWPCA ocean outfall and diffuser is a high-energy sand and mud soft-substrate, as illustrated in Figure 4.5-1. The existing 2.1-mile-long MRWPCA outfall ends approximately 1.5 miles offshore with a 1,100-foot-long underwater diffuser that sits on ballast rock at approximately 90 to 110 feet below sea level, within the waters of MBNMS. The outfall and diffuser are located approximately 3.5 miles southwest of the mouth of the Salinas River, within the area affected by the sediment plume from the river. A long-term monitoring study of the ocean outfall (ABA Consultants, 1999) reported no effects from the outfall discharge on benthic communities, or biological accumulation of contaminants in tissue. No effects were observed on the physical and chemical properties of the sediments and water column except adjacent to the outfall. The increased sediment stability provided by the physical structure of outfall pipe and accompanying ballast rock has allowed a community of tubiculous polychaetes (*Diopatra ornata*) to become established in a distinct band within 6–7 feet of the south side of the outfall. This occurrence increased the diversity and abundance of organisms near the outfall. The monitoring program also reported that the benthic community structure in the vicinity of the outfall shifted over time with a general increase in mobile epifauna and opportunistic species and a decrease in sessile species and their predators, which was consistent with patterns seen in other parts of Monterey Bay and not linked to the outfall (ABA Consultants, 1999). Video of the MRWPCA outfall taken during routine maintenance (Ballard Marine Construction, LLC 2014) revealed a rich assemblage of hard-substrate organisms inhabiting the ballast rock covering the outfall.

4.5.1.5 Non-native Invasive Aquatic Species

The introduction of non-native invasive aquatic species is one of the greatest threats to MBNMS subtidal and intertidal habitats. The introduction of non-native species into coastal Monterey Bay or estuarine ecosystems (Elkhorn Slough) can result in large-scale changes to aquatic communities. California's estuaries, in particular, have become home to many non-native or introduced species that have dominated local intertidal and subtidal marine communities. Elkhorn Slough has been reported to contain approximately 40 non-native, invasive species and a smaller number has been reported for the coastal waters of MBNMS (MBNMS 2016c).

Although the effects of introduced aquatic species on habitats they colonize is often unknown, some clearly have had serious negative influences. Impacts include decreasing abundance and even local extinction of native species, alteration of habitat structure, and extensive economic costs due to heavy organism and algal growths on vessel bottoms and navigation, scientific, and weather buoys. Historically, the principal mechanism of introduction to California coastal waters and estuaries has been fouling, boring, and release of ballast-dwelling organisms. Introduced species include snails, shrimp, plankton, crabs, and algae (MBNMS 2016c).

There are no known or reported occurrences of non-native aquatic species in the study area or more specifically the areas that will be affected by the proposed project.

The two documented non-native species occurring within coastal waters of MBNMS are the seaweed *Undaria pinnatifida* and the European green crab *Carcinus maenas*. Both species are normally associated with hard substrate habitat (SIMoN, 2016e).

4.5.2 Regulatory Framework

This section summarizes federal and state environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as "regulatory requirements") pertaining to marine biological resources and indicates the project's consistency with those regulatory requirements. There are no such local requirements related to marine biological resources that would apply to the MPWSP. The consistency findings are based on the project, as proposed, without mitigation. Where the proposed project would be consistent with the applicable regulatory requirement, no further discussion of project consistency with that regulatory requirement is provided. Where the proposed project would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to the specific impact discussion in Section 4.5.5, Direct and Indirect Effects of the Project, below, where the potential inconsistency is addressed in more detail. Where applicable, the discussion in Section 4.5.5 includes identification of feasible mitigation that would resolve or minimize the potential inconsistency.

4.5.2.1 Federal Regulations

Federal Endangered Species Act

Under the Federal Endangered Species Act (FESA), the Secretary of the Interior and the Secretary of Commerce jointly have the authority to list a species as threatened or endangered and to designate critical habitat for those species (16 United States Code [USC] 1533). Multiple species of fish and marine mammals are listed by the USFWS and NMFS under FESA, as discussed in Section 4.5.1.3. Once a species is listed and critical habitat is designated, a federal agency undertaking, authorizing or carrying out an activity must ensure, in consultation with NMFS and/or USFWS, that the activity is not like to jeopardize listed species or destroy or adversely modify critical habitat (16 USC 1536(a)(2)). The statute also prohibits the "take" of a federally listed species (16 USC 1533(d), 1538(a)). "Take" is defined by the FESA as an action that harasses, harms, pursues, hunts, shoots, wounds, kills, traps, captures, or collects, or to attempt to engage in any such conduct." MBNMS will be consulting with NMFS and USFWS pursuant to section 7 of the FESA to assess the level of potential effects from the project and minimize those effects, wherever appropriate, to ensure consistency with the statute. Additional discussion of MPWSP effects related to FESA and the terrestrial environment is provided in Section 4.6, Terrestrial Biological Resources.

Federal Regulation of Wetlands and Other Waters

The United States Army Corps of Engineers (USACE) and the United States Environmental Protection Agency (USEPA) regulate the discharge of dredged or fill material into waters of the United States, including wetlands, under Sections 404 and 401 of the Federal Clean Water Act. Projects that would result in the placement of dredged or fill material into waters of the United States require a Section 404 permit from the USACE. Section 401 of the Federal Clean Water Act requires every applicant for a federal permit or license for any activity that may result in a discharge to a water body to obtain State Water Quality Certification (Certification) that the proposed activity will comply with state water quality standards. Some classes of fill activities may be authorized under General or Nationwide Permits if specific conditions are met. Nationwide permits do not authorize activities that are likely to jeopardize the existence of a threatened or endangered species listed or proposed for listing under the Federal Endangered Species Act. In addition to conditions outlined under each Nationwide Permit, project-specific conditions can be required by the USACE as part of the Section 404 permitting process. When a project's activities do not meet the conditions for a Nationwide Permit, an Individual Permit may be issued.

The federal government also supports a policy of minimizing "the destruction, loss, or degradation of wetlands." Executive Order 11990 (May 24, 1977) requires that each federal agency take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

The MPWSP components proposed for the marine environment would be consistent with Sections 404 of the Federal Clean Water Act, and Executive Order 11990 because their construction would not include dredging or drilling in the territorial or federal waters; slant well drilling would begin approximately 900 feet inland of the shoreline and drill into and under the submerged lands of the Pacific Ocean, in State waters. Additional discussion of MPWSP effects related to wetlands and other waters of the terrestrial environment is provided in Section 4.6, Terrestrial Biological Resources.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act or MSA) (16 U.S.C. Sections 1801−1884) of 1976, as amended in 1996 and reauthorized in 2007, is intended to protect fisheries resources and fishing activities within 200 miles of shore. Conservation and management of U.S. fisheries, development of domestic fisheries, and phasing out of foreign fishing activities are the main objectives of the MSA. The MSA provided NOAA Fisheries with legislative authority to regulate U.S. fisheries in the area between 3 miles and 200 miles offshore and established eight regional fishery management councils that manage the harvest of the fish and shellfish resources in these waters.

The MSA defines "essential fish habitat" as those waters and substrate that support fish spawning, breeding, feeding, or maturation. The MSA requires that NOAA Fisheries, the regional fishery management councils, and federal agencies that take an action that may have an effect on managed fish species under MSA, identify essential fish habitat and protect important marine and anadromous fish habitat. The regional fishery management councils, with assistance from NOAA Fisheries, are required to develop and implement Fishery Management Plans. Fishery Management Plans delineate essential fish habitat and management goals for all managed fish species, including some fish species that are not protected under the MSA. Federal agency actions that fund, permit, or carry out activities that may adversely affect essential fish habitat are required under Section 305(b) of the MSA, in conjunction with required Section 7 consultation under FESA, to consult with NOAA Fisheries regarding potential adverse effects of their actions on essential fish habitat and to respond in writing to NOAA Fisheries' recommendations.

Monterey Bay is designated as essential fish habitat under four Fishery Management Plans (see **Figure 4.5-4**). These plans provide protection for Pacific groundfish, coastal pelagic species, highly migratory species, and Pacific coast salmon (i.e. Chinook salmon and Coho salmon). A total of 37 commercially important fish and shark species are managed through these four Fishery Management Plans. Within the study area, coastal pelagic species, some groundfish species, thresher sharks, and occasionally salmon are known to be present (**Table 4.5-2**). The MPWSP would be consistent with the MSA because the construction and operational impacts of the proposed project are not expected to result in any degradation of essential fish habitat within Monterey Bay.

Rivers and Harbors Appropriations Act of 1899

Section 10 of the Federal Rivers and Harbors Appropriations Act of 1899 (30 Stat. 1151, codified at 33 U.S.C. §§401, 403) prohibits the unauthorized obstruction or alteration of any navigable water (33 U.S.C. §§403). Navigable waters under the Rivers and Harbors Appropriations Act are tidally influenced waters that are presently used, have been used in the past, or could be used in the future to transport interstate or foreign commerce (33 C.F.R. 3294). Activities that commonly require Section 10 permits include construction of piers, wharves, bulkheads, marinas, ramps, floats, intake structures, cable and pipeline crossings, and dredging and excavation.

The MPWSP components proposed for the marine environment would be consistent with Section 10 of the Rivers and Harbors Appropriations Act of 1899, because their construction would occur onshore and would not obstruct or alter navigable waters. Additional discussion of MPWSP effects related to navigable waters of the terrestrial environment is provided in Section 4.6, Terrestrial Biological Resources.

Marine Mammal Protection Act

The Marine Mammal Protection Act of 1972 (MMPA), as amended in 1981, 1982, 1984, and 1995, establishes a federal responsibility for the protection and conservation of marine mammal species by prohibiting the "take" of any marine mammal. The MMPA defines "take" as the act of hunting, killing, capture, and/or harassment of any marine mammal, or the attempt at such. The Act also imposes a moratorium on the import, export, or sale of any marine mammals, parts, or products within the U.S. These prohibitions apply to any person in U.S. waters and to any U.S. citizen in international waters.

The primary authority for implementing the act belongs to the USFWS and NMFS. The USFWS is responsible for the protection of sea otters, and NMFS is responsible for protecting pinnipeds (seals and sea lions) and cetaceans (whales and dolphins).

The MMPA, as amended, provides that a citizen may request an authorization for taking of small numbers of marine mammals incidental to a specified activity (e.g. dredging, marine construction, marine transport) within a specified region. Authorizations may only be allowed if the activity would have a negligible impact on marine mammal species, or stock (a regional population under the MMPA), and would not have an unmitigable adverse impact on subsistence uses.

The MPWSP would be consistent with the MMPA because incidental take is not likely to occur from the construction and operation of the proposed project, and project activities are not expected to result in take or harassment of any marine mammals as discussed further in Section 4.5.5.

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA), enacted by Congress in 1972, is administered by NOAA's Office for Coastal Management. The CZMA provides for management of the nation's coastal resources, including the Great Lakes, and balances economic development with environmental conservation. The CZMA outlines two national programs: the National Coastal Zone Management Program and the National Estuarine Research Reserve System. Thirty-four states have approved coastal management programs. The 34 coastal programs aim to balance competing land and water issues in the coastal zone, while estuarine reserves serve as field laboratories to provide a greater understanding of estuaries and how humans impact them. The overall program objectives of CZMA remain balanced to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone." The MPWSP would be located in a unique area that encompasses both a national marine sanctuary (MBNMS) and a national estuary (Elkhorn Slough National Estuarine Research Reserve).

Under Section 307 of the CZMA (16 USC 1456), activities that may affect coastal uses or resources that are undertaken by federal agencies, require a federal license or permit, or receive federal funding must be consistent with a State's federally approved coastal management program. The primary authorities of California's federally approved coastal management program are the California Coastal Act, the McAteer-Petris Act, and the Suisun Marsh Protection Act. The California Coastal Commission (CCC) implements the California Coastal Act and the federal consistency provisions of the CZMA for activities affecting California coastal uses and resources outside of San Francisco Bay.

The MPWSP components proposed for marine environments would be fully consistent with the enforceable policies of CCC's coastal management program. See additional discussion of consistency with CCC's coastal management program under Section 4.5.2.2., State Regulations, below. Additional discussion of MPWSP consistency with the enforceable policies of CCC's coastal management program concerning terrestrial biological resources of the coastal zone is provided in Section 4.6, Terrestrial Biological Resources.

Clean Water Act

The Clean Water Act is described in Section 4.3, Surface Water Hydrology and Water Quality. Under the Clean Water Act, the USEPA seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters by implementing water quality regulations. Section 4.3, Surface Water Hydrology and Water Quality, summarizes Sections 303(d) and 402(p) of the Clean Water Act. Section 303(d) requires states to identify impaired water bodies (i.e., 303(d) List of Impaired Water Bodies). In the study area, impaired water bodies that eventually drain into Monterey Bay include Elkhorn Slough, Moro Cojo Slough, Salinas Reclamation Canal, Tembladero Slough, Old Salinas River estuary, Salinas River, and Moss Landing Harbor. In addition, the nearshore waters of northern Monterey Bay are on the 303(d) list. Section 402(p) requires National Pollutant Discharge Elimination System (NPDES) permits to control discharges of waste into waters of the United States and prevent the impairment of the receiving water for beneficial uses, which includes harm to marine biota. The USEPA has delegated authority of issuing NPDES permits in California to the SWRCB, which has nine regional boards. The Central Coast Regional Water Quality Control Board (RWQCB) regulates water quality in the project area. Discussion of the NPDES program and relevant permits is provided in Section 4.3, Surface Water Hydrology and Water Quality, Subsection 4.3.2.2. Determinations of consistency of the proposed MPWSP with specific applicable SWRCB regulations, plans and policies are also provided in Section 4.3.2.2.

National Marine Sanctuaries Act, MBNMS Regulations and Desalination Guidelines

Pursuant to the National Marine Sanctuaries Act (NMSA), originally referred to as the Marine Protection, Research, and Sanctuaries Act of 1972, the primary purpose of the NMSA is to identify, designate and manage areas of the marine environment of special national significance due to their conservation, recreational, ecological, historical, research, educational, or aesthetic qualities. Under the NMSA, it is unlawful for any person to destroy, cause the loss of, or injure any sanctuary resource managed under law or regulations for that sanctuary. NMSA general regulations define sanctuary resource as any living or non-living resource that contributes to the conservation, recreational, ecological, historical, research, educational or aesthetic value of the sanctuary, including any algae and other marine plants, marine invertebrates, brine-seep biota, phytoplankton, zooplankton, fish, seabirds, sea turtles, and marine mammals.

MBNMS was designated in 1992 in recognition that the area provides a highly productive ecosystem and a wide variety of marine habitat, including outstanding concentrations of pinnipeds, whales, otters, and seabirds, abundant fish stocks, a variety of crustaceans, and other invertebrates.

MBNMS regulations that are relevant to the construction and operation of desalination plants include restrictions on discharging material or other matter into the sanctuary and restrictions on activities that alter the submerged lands (aka seabed) as a result of the installation of desalination facility structures on or beneath the ocean floor (e.g. an intake or outfall pipeline). Each of these activities first requires MBNMS approval. In particular, MPWSP activities that would be subject to MBNMS approval include disturbance of the submerged lands due to installation of the seawater intake below the ocean floor, and the discharge of brine into sanctuary waters from an existing ocean outfall, approximately 2 miles off shore and 90-110 feet below sea level. Any actions that have the potential to alter the seabed would require an MBNMS Authorization of a Coastal Development permit issued by the CCC. Operational discharges into sanctuary waters would require MBNMS authorization of an NPDES permit issued by the RWQCB (see Section 1.3.2 for additional information). NOAA may also issue Special Use Permits to establish conditions of access to, and use of, any sanctuary resource or to promote public use and understanding of a sanctuary resource. Special Use Permits may only be authorized if that activity is compatible with the purposes for which the sanctuary is designated and with protection of sanctuary resources; and that activities carried out under the permit be conducted in a manner that does not destroy, cause the loss of, or injure sanctuary resources. NOAA recently approved a new category of Special Use Permit for the continued presence of a pipeline transporting seawater to or from a desalination facility in MBNMS (see Section 1.3.2.2).

On May 15, 2015, new federal regulations regarding introduced species became effective within MBNMS. These regulations prohibit introducing or otherwise releasing from within or into the Sanctuary an introduced species, except striped bass (*Morone saxatilis*) released during catch and release fishing activity. Federal regulation (15 CFR 922.132(a)(12)) prohibits the release of introduced species (including any biological matter capable of propagation from such species and genetically altered species).

Guidelines for Desalination Plants in MBNMS

In 2010, MBNMS in collaboration with the CCC, RWQCB, and NMFS, published a report titled *Guidelines for Desalination Plants in Monterey Bay National Marine Sanctuary* (MBNMS, 2010), which implements the desalination action plan included in the MBNMS Final Management Plan (described above). The report includes non-regulatory guidelines that were developed to help ensure that any future desalination plants in the sanctuary would be sited, designed, and operated in a manner that results in minimal impacts on the marine environment. The Guidelines address numerous issues associated with desalination including site selection, construction and operational impacts, monitoring and reporting, plant discharges, and intake systems.

The following Guidelines are pertinent to the analysis in Section 4.5.

Guidelines for Construction

- Identify potential impacts from the construction process on the marine and coastal environment.
- Best Management Practices should be developed and adhered to in order to avoid or minimize impacts on the marine environment during construction and the use of materials and practices that minimize disturbances to the environment to the maximum extent practicable should be included.

Guidelines for Brine Discharge

- All desalination plants should be designed to minimize impacts from the discharge. Desalination project proponents should investigate the feasibility of diluting brine effluent by blending it with other existing discharges. The proponent should evaluate the use of measures to minimize the impacts from desalination plant discharges including discharging to an area with greater circulation or at a greater depth, increasing in the number of diffusers, increasing the velocity while minimizing the volume at each outlet, diluting the brine with seawater or another discharge, or use of a subsurface discharge structure. The project proponent should provide a detailed evaluation of the projected short-term and long-term impacts of the brine plume on marine organisms based on a variety of operational scenarios and oceanographic conditions.
- A continuous monitoring program should be implemented to verify the actual extent of the brine plume, when deemed necessary (see Monitoring on page 4.3-13) and to determine if the plume is impacting EFH, critical habitat, or sanctuary resources. If it is, then mitigation for the EFH impact will be required.

Guidelines for Entrainment and Impingement

- All desalination plants should be designed and sited to avoid and minimize impingement and entrainment to the extent feasible.

Guidelines for Plant Site Selection

- Desalination plant intakes should be sited to avoid sensitive habitats.
- Desalination plant discharges should not be located in or near ecologically sensitive areas, including Areas of Special Biological Significance as designated by the State Water Resources Control Board, EFH Habitat Areas of Particular Concern as designated by the Pacific Fishery Management Council, and Marine Protected Areas designated under the Marine Life Protection Act.

Guidelines for Monitoring

For all desalination projects, an ongoing monitoring program must be developed to evaluate the extent of impacts from the plant's intake and discharge operations on marine biological resources. The monitoring program should:

- Develop a statistically acceptable baseline for the project area,
- Monitor source water for potential contaminants that may require additional treatment,
- Monitor the effluent prior to discharge to ensure it is in compliance with the California Ocean Plan

- Monitor the effects of the effluent on marine organisms within the plume,
- Monitor any required mitigation for unavoidable impacts to ensure the mitigation is performing as intended.

The issues discussed in the Guidelines relating to siting, constructing, and operating a desalination facility within MBNMS and the recommendations for reducing, avoiding, and minimizing impacts on sanctuary resources are reflected in the requirements of the California Ocean Plan (described in detail under State Regulations in Section 4.5.2.2, below). The Ocean Plan was recently amended (effective January, 2016) to specifically control potential adverse impacts on marine life associated with desalination facility intakes using seawater as source water and brine discharges. Further, the Ocean Plan includes specific enforceable numeric water quality objectives and other requirements pertaining to siting, constructing, and operating a desalination facility that are consistent with the Guidelines. The requirements set forth in the Ocean Plan were informed by the SWRCB collaborating with the Southern California Coastal Water Research Project to evaluate methods of brine disposal and monitoring strategies. Additionally, the amendments to the Ocean Plan were assessed in a SWRCB staff report analyzing desalination facility intakes and brine discharges which provides the rationale for how implementing such measures reduce potential environmental impacts from desalination facilities (SWRCB, 2015). To reflect this evolution of regulatory requirements supported by evidence based research, the Ocean Plan requirements are used, in part, as key thresholds of significance in the evaluation criteria for assessing impacts. The Ocean Plan requirements are generally more stringent and have more specificity regarding assessment and monitoring requirements than the Guidelines. As such, the Ocean Plan requirements are substantially consistent with the Guidelines. Impacts on sanctuary resources from brine discharges are discussed in detail in **Impact 4.3-4** and **Impact 4.3-5** as well as in Section 4.5, Marine Biological Resources. Section 6.4 includes a comprehensive list of Guideline recommendations and summarizes the proposed project's consistency with those guidelines.

NOAA (MBNMS) Memorandum of Agreement with State and Federal Agencies

NOAA (MBNMS) entered into a Memorandum of Agreement (MBNMS et al., 2015c) with the State of California, USEPA, and the Association of Monterey Bay Area Governments, which addresses the process for implementing the following water quality regulations applicable to State waters within the MBNMS:

- NPDES permits issued by the State of California under Section 13377 of the California Water Code; and
- Waste Discharge Requirements issued by the State of California under Section 13263 of the California Water Code.

The Memorandum of Agreement specifies how the review process for applications for leases, licenses, permits, approvals, or other authorizations will be administered within State waters in the MBNMS in coordination between the State and the Sanctuary's permit programs. The MBNMS Superintendent develops and follows a management plan that ensures protection of these resources, provides for research and education, and facilitates recreational and commercial uses, which are compatible with the primary goal of resource protection. MBNMS also implements the Water Quality Protection Program to enhance and protect the chemical, physical, and biological integrity of the sanctuary. The program is a partnership of many local, state, and federal government agencies and calls for education, funding, monitoring, and development of treatment facilities and assessment programs to protect water quality (MBNMS et al., 2015c).

The discharge of brine effluent to the Sanctuary is a prohibited activity and has the potential to injure sanctuary resources, and as such, the proposed project is potentially inconsistent with the NMSA. Effects of discharges are discussed in Impact 4.5-4.

MBNMS has also partnered with research and management agencies to establish Sanctuary Ecologically Significant Areas in MBNMS (see **Figure 4.5-5**). These areas have been demonstrated to have "remarkable, representative and/or sensitive marine habitats, communities and ecological processes" (MBNMS, 2016d).

National Invasive Species Act

Under the National Invasive Species Act of 1996, the United States Coast Guard (USCG) established national voluntary ballast water guidelines. The USCG published regulations on June 14, 2004, establishing a national ballast water management program with mandatory requirements for all vessels equipped with ballast water tanks that enter or operate in U.S. waters. The regulations carry mandatory reporting requirements to aid in the USCG's responsibility, under the National Invasive Species Act, to determine patterns of ballast water movement. The regulations also require ships to maintain and implement vessel-specific ballast water management plans.

The MPWSP would be consistent with the National Invasive Species Act because the construction and operational impacts of the proposed project do not involve the use of vessels or other potential vectors for the introduction or transplantation of non-native, invasive species. Any maintenance of the existing MRWPCA outfall would be similar to or less than currently occurring maintenance and would utilize local vessels.

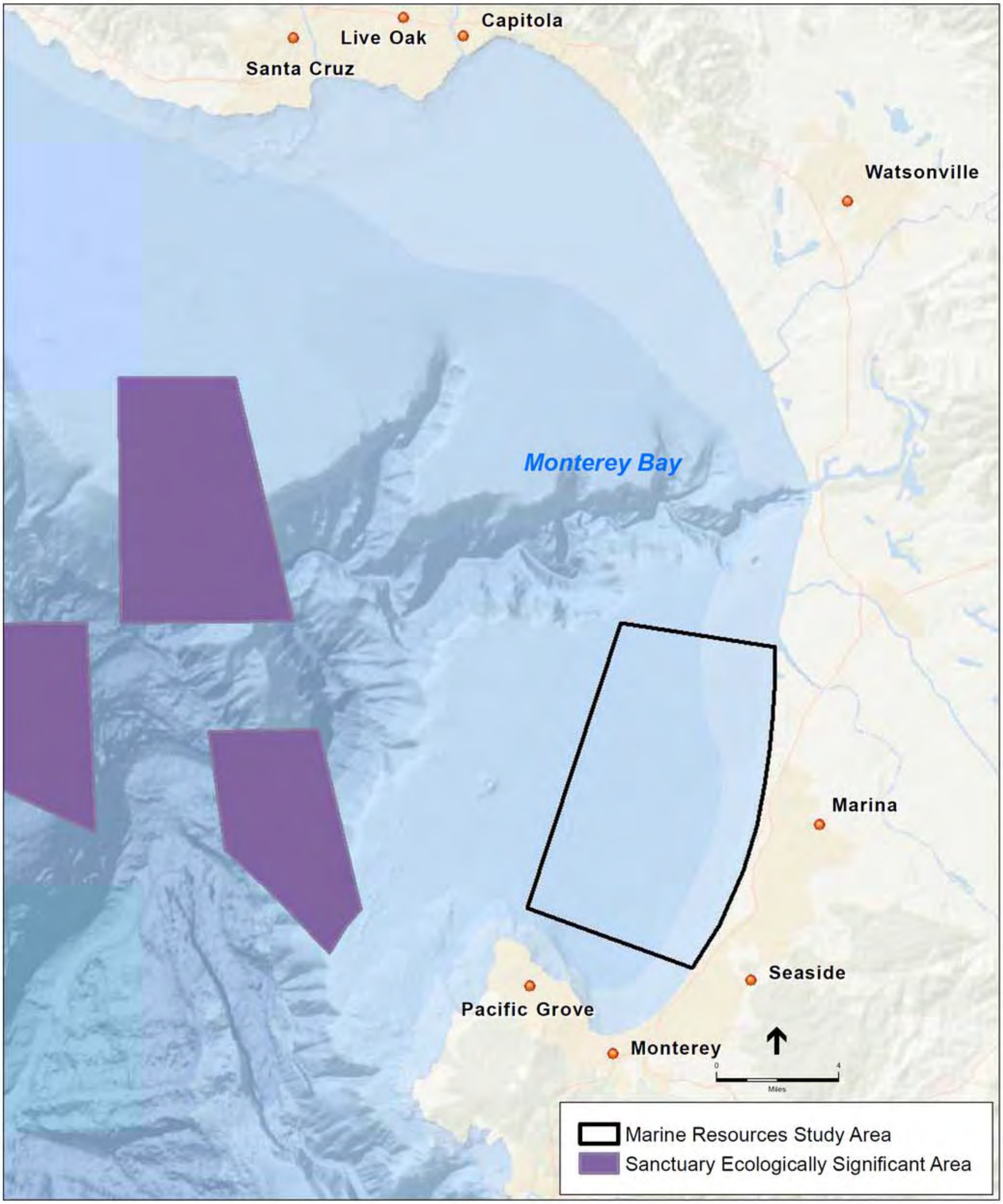
4.5.2.2 State Regulations

California Endangered Species Act

Under CESA, CDFW maintains lists of threatened and endangered species, candidate species, species of special concern and fully protected species. Marine species that are protected by CESA and have the potential to occur in the study area are listed in **Table 4.5-2**. The MPWSP components proposed for the marine environment would be consistent with CESA because their construction and operation are not expected to result in the take of any State protected species. Additional discussion of MPWSP effects related to CESA and the terrestrial environment is provided in Section 4.6, Terrestrial Biological Resources.

Fish and Game Code Sections 3503, 3511, 4700, 5050, and 5515

CESA-listed endangered and threatened species may not be taken or possessed at any time without a permit from CDFW (Fish and Game Code Section 3511 Birds, Section 4700 Mammals, Section 5050 Reptiles and Amphibians, and Section 5515 Fish). The MPWSP components



SOURCE: NOAA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.5-5
Sanctuary Ecologically Significant Areas Designated in MBNMS

proposed for the marine environment would be consistent with Fish and Game Code Sections 3503, 3511, 4700, 5050, and 5515 because their construction and operation are not expected to result in the take or possession of any State protected species. Additional discussion of MPWSP effects on CESA-listed species of the terrestrial environment is provided in Section 4.6, Terrestrial Biological Resources.

Marine Life Protection Act

The objective of the Marine Life Protection Act (MLPA) is protection of ecosystem structure and function. Specific mandates of the MLPA are to sustain, conserve, and rebuild depleted populations. The MLPA works in concert with the Marine Life Management Act. Within California, most of the legislative authority over fisheries management is enacted within the MLPA. This law directs CDFW and the Fish and Game Commission to issue sport and commercial harvesting licenses, as well as license aquaculture operations. CDFW, through the commission, is the State's lead biological resource agency and is responsible for enforcement of the State endangered species regulations and the protection and management of all State biological resources. A very important part of MLPA enactment has been the establishment of State Marine Protected Areas (MPAs) along the California coast. Fishing and other consumptive activities are strictly regulated in State MPAs in order to provide refuges within which healthy stocks can be maintained to ensure propagation along the entire coast. See **Figure 4.5-6**.

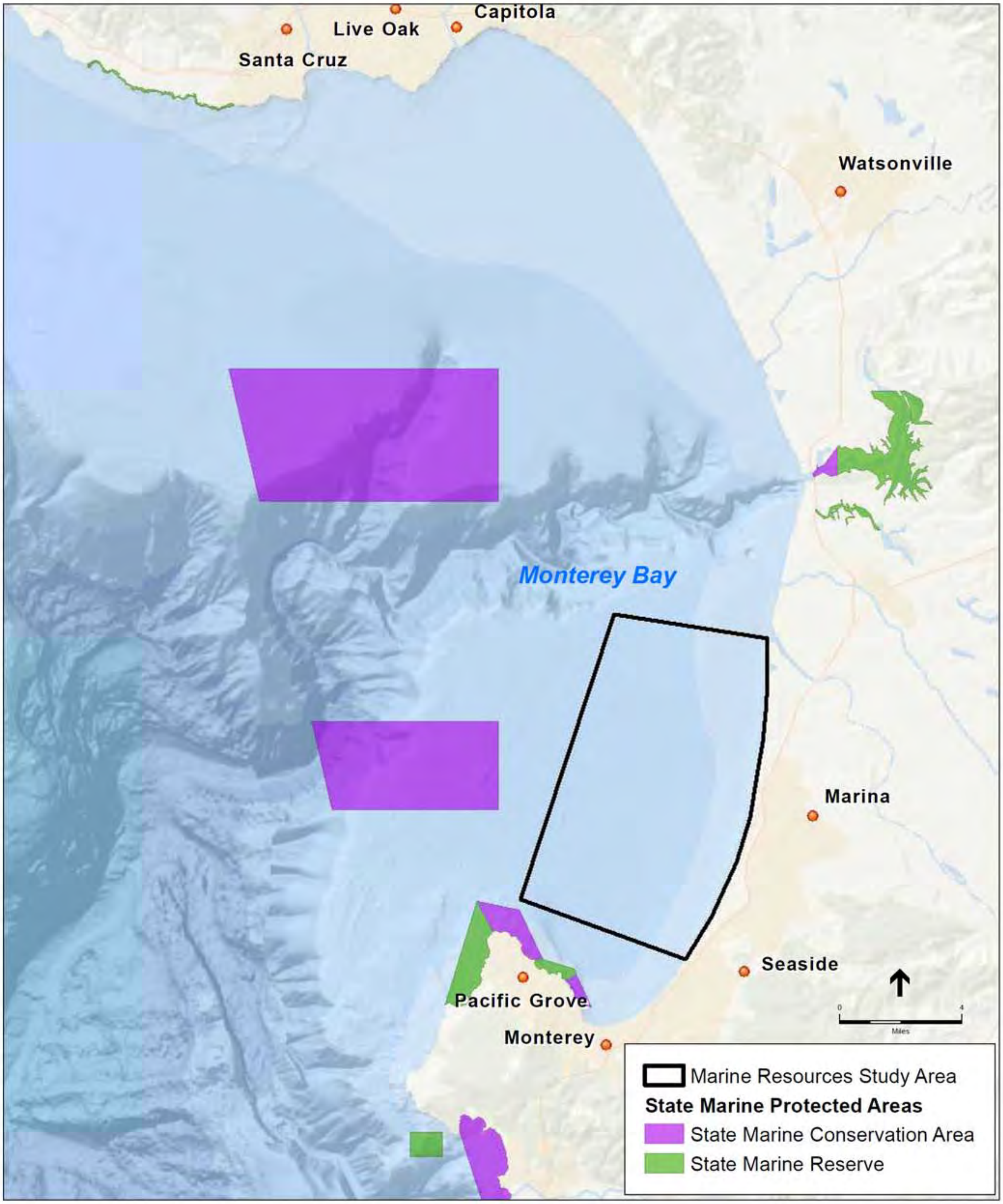
The MPWSP would be consistent with the MLPA because the construction and operational impacts of the proposed project are not expected to result in any degradation of ecosystem structure and function within Monterey Bay or to reduce the efficacy of MPAs within the Bay.

Marine Life Management Act

The Marine Life Management Act works in concert with the MLPA by advancing fishery management as an important element of ecosystem integrity and sustainability. Under the MLMA, implementation of the California Nearshore Fisheries Management Plan (NFMP) and the California Market Squid Fisheries Management Plan (MSFMP) affect species found in Monterey Bay (see **Table 4.5-4**).

Nearshore Fisheries Management Plan

The five goals of the Nearshore Fishery Management Plan (NFMP) are to ensure long-term resource conservation and sustainability, to employ science-based decision-making, to increase constituent involvement in management, to balance and enhance socio-economic benefits, and to identify implementation costs and sources of funding. The following measures are employed to meet the primary goal of sustainability: a fishery control rule including size limits, time/area closures, or gear restrictions, regional management tailored to conditions specific to each of four regions, marine protected areas, restricted fishery access, and allocation of total allowable catch (CDFG, 2002). All of the species regulated by the NMFP are primarily associated with rocky substrate.



SOURCE: NOAA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.5-6

Marine Protected Areas along the California Coast

Market Squid Fisheries Management Plan

The Market Squid Fishery Management Plan (MSFMP) establishes a management program for California's market squid (*Doryteuthis opalescens*) resource. The goals of the MSFMP are to manage the market squid resource to ensure long term resource conservation and sustainability, reduce the potential for overfishing, and institute a framework for management in light of potential environmental and socioeconomic changes. The tools implemented to accomplish these goals include fishery control rules (e.g., seasonal catch limits, weekend closures), creation of a restricted access program, and establishment of a seabird closure restricting the use of attracting lights for commercial purposes (CDFG, 2005).

The MPWSP would be consistent with the MLMA because the construction and operational impacts of the proposed project are not expected to substantially affect rocky substrate habitat or interfere with management of the nearshore or market squid fisheries.

California Ocean Plan

The California Ocean Plan (Ocean Plan) is described in Section 4.3, Surface Water Hydrology and Water Quality. The Ocean Plan establishes water quality objectives and beneficial uses for waters of the Pacific Ocean within 3 miles of the California Coast (SWRCB, 2012). NPDES waste discharge permits set discharge limits that are required to prevent exceedances of the water quality objectives in the Ocean Plan. The proposed project would discharge into Monterey Bay and therefore is subject to all Ocean Plan water quality objectives and NPDES requirements. The most relevant water quality objectives include:

- Marine communities, including vertebrate, invertebrate, and plant species shall not be degraded;
- Waste management systems that discharge into the ocean must be designed and operated in a manner that will maintain the indigenous marine life and a healthy and diverse marine community; and
- Waste discharged to the ocean must be essentially free of substances that will accumulate to toxic levels in marine waters, sediments or organisms.

The basis for water quality objectives established in the Ocean Plan is the protection of beneficial uses designated for each section of coastline by Regional Water Quality Control Boards (see **Table 4.3-3** in Section 4.3, Surface Water Hydrology and Water Quality). The designated beneficial uses relevant to marine biological resources in the study area are as follows:

- **Marine Habitat** – Uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).
- **Shellfish Harvesting** – Uses of water that support habitats suitable for the collection of filter- feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sport purposes. This includes waters that have in the past, or may in the future, contain significant shellfisheries.

- **Commercial and Sport Fishing** – Uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.

Another relevant beneficial use is as follows:

- **Rare, Threatened, Endangered or Protected Species** – Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, endangered or protected.

While not having been designated for coastal waters between Salinas River and Monterey Harbor, this beneficial use requires consideration here because it is known that Southern sea otters forage in the study area.

Operational discharges resulting from implementation of the MPWSP may be inconsistent with provisions of the California Ocean Plan. This issue is discussed further in Section 4.3, Surface Water Quality and Hydrology, Subsection 4.3.2.2 and Impact 4.3-5.

Marine Invasive Species Act

All shipping operations that involve major marine vessels are subject to the Marine Invasive Species Act of 2003 (Public Resources Code Sections 71200 through 71271), which revised and expanded the California Ballast Water Management for Control of Non-indigenous Species Act of 1999 (AB 703). This act is administered by the California State Lands Commission. The act regulates the handling of ballast water from marine vessels arriving at California ports in order to prevent or minimize the introduction of invasive species from other regions.

The MPWSP would be consistent with the Marine Invasive Species Act because the construction and operational impacts of the proposed project would not involve the use of vessels or other potential vectors that could introduce or transplant non-native invasive species. Any maintenance of the existing MRWPCA outfall would utilize local vessels and would be similar to or less than what is already occurring.

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) provides for the long-term management of lands within California's coastal zone boundary. Of primary relevance to marine biological resources are Coastal Act policies concerning: preservation and maintenance of marine biological resources; protection of the productivity and quality of coastal waters; prevention of oil and hazardous substance spills; minimization of continued movement of sediment and nutrients, and protection of recreational and commercial fisheries. A preliminary assessment of project consistency with this priority is provided here, however, a consistency certification will be provided to CCC as required by the Coastal Zone Management Act and its federal consistency regulations. The CCC will make the final decision as to whether the project is fully consistent.

With respect to preservation and maintenance of marine biological resources, construction and operation of the subsurface slant wells would have no effect. Sound generated by drilling operations would be greatly attenuated before reaching the water and the velocity of seawater pumped in through the intake wells would be so low that organisms would not be impinged on the seafloor. Operation of the brine discharge through the MRWPCA outfall would be managed to ensure that salinity, temperature and concentrations of other contaminants would remain within regulatory objectives and at levels known to be protective of marine organisms.

Concerning the productivity and quality of coastal waters, the MPWSP would not release any drilling fluids or other human-made materials during drilling or operation of the subsurface slant wells; nor would drilling affect natural water clarity. The discharge of brine and associated contaminants through the MRWPCA outfall would include only organic and inorganic constituents present in the source ocean water. While the brine discharge would increase salinities within the Zone of Initial Dilution around the diffuser, management of the brine discharge would ensure that salinities outside the Zone of Initial Dilution would not exceed 2 ppt above ambient salinities, in accordance with the Ocean Plan.

As for oil and hazardous substance spills, the MPWSP would be required to prepare and implement Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan and comply with the California Fire Code, as discussed more fully in Section 4.7, Hazards and Hazardous Materials. These measures would ensure that any spills would be contained onshore in the immediate vicinity of spillage. Operation of the Reverse Osmosis system would also ensure that any spills of petroleum or hazardous materials would be prevented from entering the brine discharge stream.

Regarding minimization of continued movement of sediment and nutrients, the drilling and operation of the subsurface slant wells would not alter the contour or character of the seafloor or shoreline environment. Onshore construction on the beach could temporarily re-suspend local beach sand but such an effect would be temporary and the beach contour would be returned to normal when construction is completed. Accordingly, drilling and operation of the subsurface slant wells would not restrict the movement of sediments or nutrients. The discharge of brine through the MRWPCA outfall and diffuser would also have no effect on the movement or character of sediments or nutrients beyond that which might already occur due to the physical structure of the outfall.

With respect to protection of recreational and commercial fisheries, the construction and operation of the subsurface slant wells would involve no changes to seafloor topography or overlying water quality. This means the project would produce no physical obstructions to fishing gear and have no effect on fish stocks. The concentrations of salts and contaminants in the brine discharge would be kept below those currently allowed for desalination systems and the existing MRWPCA municipal wastewater discharge, which would ensure no anticipated adverse effects on fish stocks.

For these reasons the project would not conflict with Coastal Act policies related to marine biological resources.

4.5.3 Evaluation Criteria

Impacts on marine biological resources would occur as a result of alterations to, or deterioration of marine aquatic habitats, which in turn would result in direct or indirect effects on marine taxa, communities, and food webs. Direct and indirect impacts on marine and aquatic taxa (i.e., plankton, fish, marine mammals, etc.) would not discriminate, and would affect all marine and aquatic taxa in the study area regardless of its species, whether it is listed as sensitive or not, or with which agency. The evaluation criteria therefore, consider the potential effects of the proposed project on habitat, special status species, and species considered in local, regional or federal resource management plans.

Implementation of the proposed project would have a significant impact on marine biological resources if it would:

- Have a substantial adverse effect, either directly or indirectly through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH)); or as identified by the CDFW, USFWS, or NMFS; or
- Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels; or cause modification of breeding, feeding or sheltering behavior; or
- Interfere substantially with the movement of any native resident or migratory fish or marine wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native marine wildlife nursery sites.

Based on the location and nature of the proposed project, the following criteria are not considered in the impact analyses in Sections 4.5.5.1 and 4.5.5.2 for the reasons described below.

- ***Introduce or spread an invasive non-native species***. Implementation of the MPSWP would not involve any construction or operational activities that would require the use of ocean vessels, and would not involve the temporary or permanent placement of any facilities in the Monterey Bay or adjacent harbors. Therefore, implementation of the proposed project would not have a means of introducing or relocating non-native invasive marine species. This criterion is not applicable to the proposed project and is not discussed further.

4.5.4 Approach to Analysis

Three aspects of the proposed project have the potential to adversely affect marine biological resources: (1) noise from the construction of the subsurface slant wells; (2) operation of the subsurface slant wells as it relates to impingement; and (3) operational discharges of brine generated by the MPWSP desalination plant via the MRWPCA existing ocean outfall. As discussed in Chapter 3, Description of the Proposed Project, the proposed slant wells would be located approximately 2 miles south of the Salinas River in the CEMEX active mining area in northern Marina. Nine new permanent slant wells would be installed from the shore using a dual rotary drilling rig. The slant wells would extend beneath the coastal dunes, sandy beach, and sandy subtidal (surf zone)[7] habitats of Monterey Bay, terminating up to 350 feet seaward of mean high water (MHW) at a depth of 190 to 210 feet below the seafloor in the submerged lands of MBNMS.

The desalination process would generate an average of approximately 14 mgd of brine that would be discharged through the existing MRWPCA ocean outfall. The outfall currently is and would continue to be used to discharge treated wastewater effluent from the MRWPCA Regional Wastewater Treatment Plant. The outfall terminates at an underwater diffuser located approximately 2 miles offshore (relative to MHW) at 90 to 110 feet below mean sea level where a soft mud substrate predominates.

The evaluation of whether the proposed project would result in substantial adverse effects considers three principal factors:

- Magnitude and duration of the impact (e.g., substantial/not substantial);
- Rarity of the affected resource; and
- Susceptibility of the affected resource to disturbance.

The evaluation of significance must also consider the interrelationship of these three factors. For example, a relatively small magnitude effect on a state or federally listed species could be considered significant if the species is rare and highly susceptible to potential disturbances resulting from the proposed project. Conversely, for a natural community that is not considered rare or particularly sensitive to disturbance, such as soft substrate benthos, an impact of much larger magnitude and/or longer duration would be required to result in a significant impact determination.

Underwater noise generated during slant well construction could result in impacts on marine biological resources. The potential underwater noise impacts on marine biological resources from slant well drilling were evaluated based upon reported sensitivities of marine organisms to frequency (pitch) and amplitude (decibel) and the reported disturbances from other similar operations, compared to underwater noise that would be generated by the proposed project.

Impacts on marine biological resources arising from slant well operations due to potential impingement of marine organisms and particulate material were evaluated using reports on the speeds of wave-induced and ambient ocean currents, and the velocity of water being drawn through the seafloor to the slant wells. Ocean current and organism swimming speeds were compared to the anticipated velocity of the subsurface slant wells at the seafloor to determine the probability of impingement of organisms and particulate material against the seafloor.

[7] a high wave energy environment

Impacts from elevated salinity and shear stress on marine biological resources due to brine discharge were also evaluated. Predicted discharge salinities were evaluated against Ocean Plan (SWRCB, 2015) thresholds (salinity no more than 2 ppt above background at the edge of the BMZ) and the results of toxicity tests and other experiments, as well as the recommendations of various commissions and working groups convened to set guidelines for desalination facilities. Elevations in ocean salinities above ambient salinity levels due to the discharge of brine from the proposed project were evaluated using several models that predicted salinity at the edge of the Zone of Initial Dilution (ZID) and at the Brine Mixing Zone (BMZ) during three oceanographic seasons (Davidson, upwelling and oceanic) under generally prevailing water temperatures and salinities. See also Section 4.3, Surface Water Hydrology and Water Quality, for the complete discussion on the approach to this analysis, and the effects of the brine discharge on ocean water quality resulting from the proposed project. These modeled salinities were compared to studies on the effects of elevated salinity on marine organisms. Potential impacts on marine organisms due to shear stress associated with the brine discharge through the MRWPCA outfall were also evaluated based upon the hydrodynamics of the current and proposed discharge scenarios (see Appendix D1).

Potential impacts on marine taxa from exposure to elevated concentrations of other select constituents in the effluent estimated at the edge of the ZID, are based on published toxicity data and the Ocean Plan water quality objectives that specify concentrations above which marine life could be at risk. In cases where the estimated concentrations of the constituents in the discharge could be near or above Ocean Plan objectives, actual toxicity data were obtained from available sources. Conservative estimates of contaminant concentrations were made using a combination of ocean water data obtained from the Central Coast Long-term Environmental Assessment Network (CCLEAN) and high-volume samples collected from the test slant well on the CEMEX property. Estimates based on CCLEAN data assumed the entire mass of contaminants in seawater drawn into the MPWSP Desalination Plant would be concentrated and returned to the ocean in the brine.

4.5.5 Direct and Indirect Effects of the Proposed Project

Direct and indirect effects of the proposed project are considered in the following sections. Consideration is given to those project elements that would have an effect on marine biological resources, marine habitats, and MBNMS resources as a result of the intake of desalination source water or the discharge of brine from the desalination process. Accordingly, drilling of the slant wells is the only construction activity that is considered here. The operational aspects considered are the operation of the wells and the discharge of brine. Impacts on marine biological resources that could result from implementation of water quality mitigation, such as retrofitting discharge diffuser ports to improve dilution, are discussed in Section 4.3, Surface Water Hydrology and Water Quality.

A summary of project impacts on marine biological resources is provided in **Table 4.5-5**.

TABLE 4.5-5
SUMMARY OF IMPACTS – MARINE BIOLOGICAL RESOURCES

Impacts	Significance Determinations
Impact 4.5-1: Result in a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any marine species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH); or as identified by the CDFW, USFWS, and/or NMFS during construction.	LS
Impact 4.5-2: Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels during construction; or cause modification of breeding, feeding or sheltering behavior.	LS
Impact 4.5-3: Interfere substantially with the movement of any native marine resident or migratory fish or marine wildlife species or with established native resident or migratory marine wildlife corridors, or impede the use of native marine wildlife nursery sites during construction.	LS
Impact 4.5-4: Result in a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any marine species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH); or as identified by the CDFW, USFWS, and/or NMFS during operations.	LS
Impact 4.5-5: Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels during operations.	LS
Impact 4.5-6: Interfere substantially with the movement of any native marine resident or migratory fish or marine wildlife species or with established native resident or migratory marine wildlife corridors, or impede the use of native marine wildlife nursery sites during operations.	LS
Impact 4.5-C: Cumulative impacts on marine biological resources.	LS

NOTES:
LS = Less than Significant

4.5.5.1 Construction Impacts

The subsurface slant wells are the only project components that would involve construction in or near the marine biological resources study area (see Figure 4.5-1). Since none of the other project facilities would require construction in the marine biological resources study area, construction of the other project facilities would not directly or indirectly affect marine biological resources and are not discussed below. Marine birds, anadromous fish, and inland fish are addressed in Section 4.6, Terrestrial Biological Resources.

Impact 4.5-1: Result in a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any marine species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH); or as identified by the CDFW, USFWS, and/or NMFS during construction. (*Less than Significant*)

Underwater noise from the drilling operation itself, the potential accidental release of drilling fluid, and the possible discharge of clarified[8] groundwater recovered during drilling operations are the only possible construction activities that could affect marine biological resources and habitats.

The directional drilling of the slant wells would generate some subterranean noise that would transmit into seafloor sediments, including into the submerged lands of the MBNMS. What little underground drilling or tunneling noise data that is available is for tunnel boring machines (TBM), which are used to dig large-diameter transportation and water conveyance tunnels and would not be used for slant well construction. TBM equipment is fully located within the borehole or tunnel and all noise generating equipment, including drilling motors, cutter heads, drilling fluid recirculating pumps, etc. are located within the tunnel as well. As discussed in Chapter 3, Description of the Proposed Project, Section 3.3.2.1, all construction activities associated with the subsurface slant wells would occur several hundred feet inland of the maximum high-tide elevation, in previously disturbed areas. Most of the slant well noise-generating equipment would be located on the land surface outside of MBNMS, and the only down hole noise source during the 24-month construction period would be the cutter head and drilling fluid recirculating pump. As a result, the noise generated from TBM operations can be expected to be substantially higher than that generated by the cutter head for the proposed subsurface slant wells.

The San Francisco Public Utilities Commission drilled a 5-mile-long, 9-foot-diameter tunnel under San Francisco Bay. A TBM was used to drill the tunnel located approximately 125 feet below the San Francisco Bay seafloor. Wilson, Ihrig, and Associates calculated noise levels generated by normal cutting operations from the TBM inside the tunnel to range between 122 to 129 decibels (dB) root-mean-square,[9] at a frequency of 30 to120 hertz (Hz), with occasional peak levels at 134 dB at the bottom of the bay (Wilson Ihrig, and Associates, et al 2009).

The thickness of overlying sediments for the proposed project is greater than for the TBM operations under San Francisco Bay (i.e., 195 to 200 feet versus 125 feet in San Francisco Bay), and would act to further muffle transmitted underwater noise. Underwater noise attenuates through water-saturated sediments in proportion to the frequency of the sound waves (Hefner and Williams, 2004). Assuming a worst-case noise level equal to the noise generated by TBM (129 dB at 30 Hz) is emitted in a slant well, the drilling noise would attenuate at the rate of approximately 2.5 dB per meter (per 3.28 feet), potentially resulting in 144 dB of sound being attenuated through 190 feet (approximately 58 meters) and reaching zero by the time it reaches the seafloor surface. Measurements by Wilson et al (1997) found that underwater surf noise offshore of the former Fort Ord area in Monterey Bay, near the proposed slant well site, averaged 138 dB at 50 Hz and Farber and Wilson (1997).

8 Clarified Water: Water that has been processed to remove suspended sediments and is therefore “clear” and when discharged to the ocean will not result in increased turbidity.

9 Root-mean-square: The square root of the average over a period of time of the square of the amplitude. The root-mean-square level is often used to correlate the effects of sound and vibration on humans and mammals. Decibels reported in this section are hydroacoustic (underwater) decibels. Unlike airborne decibels used in the analysis of Section 4.12, Noise and Vibration, which are referenced to 20 micro Pascals, all underwater sound levels are referenced to 1 micro Pascal. Consequently, underwater sound levels are typically 26 dB higher than airborne levels because of the different reference levels as well as an additional 34 A-weighted decibels (dBA) higher due to the higher impedance of water.

In the event that some underwater noise reaches the seafloor surface, scientific investigations on the potential effect of underwater noise on fish indicate that sound levels below 183 to 187 dB do not appear to result in any acute physical damage or mortality to fish (barotraumas) depending on their size (Dalen and Knutsen, 1986; Caltrans, 2009). A startle response in salmon has been documented to occur at underwater sound levels of 140 to 160 dB (San Luis and Delta Mendota Water Authority and C.H. Hanson, 1996). Additionally, underwater noise levels greater than 160 dB are presumed to result in behavioral effects, temporary hearing loss, or permanent hearing loss depending on the species and the nature of the source (NMFS, 2016). **Table 4.5-6** provides a summary of some known acute and sub-lethal effects of underwater noise on fish and marine mammals. **Table 4.5-7** presents underwater noise levels at which NOAA has determined that both acute and sub-lethal effects occur for different groupings of marine mammals. Any of the drilling noise reaching overlying ocean waters is expected to be below background underwater noise levels and would have no effect on any marine organisms including special-status species.

The degradation of water quality resulting from the discharge of water produced during well drilling and well development is addressed in Impact 4.3-2, in Section 4.3, Surface Water Hydrology and Water Quality. Drilling of the subsurface slant wells would involve the use of water, bentonite mud, and/or the use of environmentally inert biodegradable additives to push the drill rig through the uppermost layer of dry dune sands as described in Section 3.3.2.1. Once the drill bit reaches groundwater, the mud slurry from the upper 100 feet of drilling would be pumped out and put it in a storage container for offsite hauling and disposal. Beyond this point only the water already present in the sand and potable water would be used to circulate the drill cuttings. Once the borehole and the casing and gravel pack have been installed, potable water would be circulated through the well casing to develop the well. The effluent produced during well development, which may contain soil cuttings and formation water (water present at depth in geologic materials), would be pumped to baker tanks to allow sediment to settle out. The clarified effluent would then either be conveyed to the existing discharge pipeline for the test slant well and discharged to the ocean via the MRWPCA ocean pipeline and outfall in or percolated into the ground at the CEMEX active mining area. The discharge of any clarified waters from slant well drilling through the MRWPCA outfall would be in compliance with the existing NPDES permit and Ocean Plan water quality objectives for turbidity and would not cause any impact on marine biological resources or habitats, including special status species and sanctuary resources in MBNMS.

The potential for the inadvertent release of drilling fluids into ocean waters during drilling of the slant wells would be very low, because these environmentally inert, biodegradable drilling additives or sand-bentonite mud slurry would only be used while drilling the initial 100 feet of loose dry sand, above the water table. After that point in the HDD bore, only potable water would be used to circulate and remove drill cuttings. Since the risk of accidentally discharging drilling fluids to the marine environment from HDD slant wells would be very low and the use of these additives is common practice, the potential impact from HDD slant well drilling and circulation fluids would be less than significant. Moreover, the bentonite slurry would be contained and properly disposed of offsite, as discussed in Section 4.3, Surface Water Hydrology and Water Quality.

TABLE 4.5-6
POTENTIAL EFFECTS OF VARYING UNDERWATER NOISE LEVELS ON FISH

Taxa	Sound Level (dB)	Effect	Reference
Fish			
All fish > 2 grams in size	206 peak 187 (SEL)	Acute Barotraumas	Fisheries Hydroacoustic Working Group, 2008 (Caltrans, 2009)
All fish < 2 grams	186 (SEL)	Acute Barotraumas	Fisheries Hydroacoustic Working Group, 2008 (Caltrans, 2009)
Pacific Herring	180-186	Avoidance behavior	Dalen and Knutsen, 1986
Salmon, steelhead	166	Avoidance behavior	Loeffelman et al., 1991
Salmon, Steelhead	140-160	Startle response	San Luis and Delta Mendota Water Authority and C.H. Hanson, 1996

TABLE 4.5-7
SUMMARY OF NOAA ESTABLISHED PERMANENT THRESHOLD SHIFT (PTS)[1] AND TEMPORARY THRESHOLD SHIFT (TTS)[2] SOUND LEVELS[3] FROM UNDERWATER NOISE LEVELS FOR MARINE MAMMALS

Hearing Group	Impulsive[4]	Non-impulsive[5]
Low-Frequency (LF) Cetaceans (Baleen whales)	$L_{pk,\ flat}$: 219 dB $L_{E,}L_{F,24H:}$ 183 dB	$L_{E,}L_{F,24H:}$ 199 dB
Mid-Frequency (MF) Cetaceans (Dolphins, toothed whales, beaked whales, bottlenose dolphins)	$L_{pk,\ flat}$: 230 dB $L_{E,}L_{F,24H:}$ 185 dB	$L_{E,}L_{F,24H:}$ 198 dB
High-Frequency (HF) Cetaceans (True porpoises, Kogia, river dolphins, cephalohynchid, Lageniorhynchus cruciger, and L. asustralis)	$L_{pk,\ flat}$: 202 dB $L_{E,}L_{F,24H:}$ 155 dB	$L_{E,}L_{F,24H:}$ 173 dB
Phocid Pinnipeds (True Seals) (Underwater)	$L_{pk,\ flat}$: 218 dB $L_{E,}L_{F,24H:}$ 185 dB	$L_{E,}L_{F,24H:}$ 201dB
Otariid Pinnipeds (Sea lions and fur seals) (Underwater)	$L_{pk,\ flat}$: 232 dB $L_{E,}L_{F,24H:}$ 203 dB	$L_{E,}L_{F,24H:}$ 219 dB

NOTES:

1 Permanent Threshold Shift is when a permanent reduction in hearing occurs or the frequencies at which sound can be detected is permanently reduced.
2 Temporary Threshold Shift is when a short-term (temporary) reduction in hearing or the frequency at which sound can be detected occurs.
3 Peak sound pressure (*L*pk) has a reference value of 1 μPa, and cumulative sound exposure level (*L*E) has a reference value of 1μPa^{2}s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (i.e., varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.
4 Impulsive noise is a category of noise which includes unwanted, almost instantaneous sharp sounds.
5 All noise not included in the definition of impulsive noise

SOURCE: NMFS, 2016

Impact Conclusion

Underwater noise generated during slant well drilling would be attenuated to zero at the seafloor and would have no impact during construction on marine biological resources in MBNMS. Additionally, because the drilling operation would be set back approximately 900 feet from MHW and the construction contractor would manage drilling muds and potential discharges of clarified groundwater in accordance with regulatory requirements, the potential for an accidental release of any hazardous drilling fluids into waters of MBNMS, or increased turbidity in Monterey Bay during slant well construction, would be less than significant. No impacts would occur from the construction of any other proposed facility because none occur within the marine biological resources study area. Therefore, this impact is considered to be less than significant.

Mitigation Measures

None proposed.

Impact 4.5-2: Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels during construction; or cause modification of breeding, feeding or sheltering behavior. *(Less than Significant)*

As discussed for Impact 4.5-1, the potential for underwater noise, ocean discharge of clarified groundwater, or the accidental release of well drilling fluids to result in effects on marine biological resources or habitats would be less than significant. These activities are not expected to cause a fish or marine wildlife population to drop below self-sustaining levels or cause modification of their breeding, feeding or sheltering behavior. Therefore, the evaluation of impacts from drilling fluids, discharge of clarified ground water, and noise on marine species in MBNMS would be the same as for Impact 4.5-1; less than significant.

Mitigation Measures

None proposed.

Impact 4.5-3: Interfere substantially with the movement of any native marine resident or migratory fish or marine wildlife species or with established native resident or migratory marine wildlife corridors, or impede the use of native marine wildlife nursery sites during construction. *(Less than Significant)*

As discussed for Impact 4.5-1, there is little to no potential for underwater noise, ocean discharge of clarified groundwater, or the accidental release of well drilling fluids to interfere with the movement of any native marine resident or migratory fish or marine wildlife species in MBNMS because the drilling activities would occur onshore and extend under the seafloor. Therefore, the impact would be less than significant.

Mitigation Measures

None proposed.

4.5.5.2 Operational and Facility Siting Impacts

Potential operational impacts on marine biological resources would be limited to adverse effects associated with operation of the subsurface slant wells and the discharge of brine generated at the proposed MPWSP desalination plant. Because none of the other project facilities would affect marine biological resources, none of the other facilities are discussed.

Impact 4.5-4: Result in a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any marine species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH); or as identified by the CDFW, USFWS, and/or NMFS during operations. (*Less than Significant*)

Impacts on marine species during MPWSP operations as a result of the impingement of organisms or through the accumulation of fine particulate material on the seafloor, from elevated salinity or other constituents in the brine, or from shear stress[10] on plankton from discharged brine were evaluated. The risk was also assessed for indirect impacts caused by loss of foraging habitat and prey species on protected species such as marine mammals (for example, the Southern sea otter and California gray whale), seabirds, and other species, should the benthic infauna and macrofauna populations decline.

Impingement of Marine Organisms on the Seafloor

A key and fundamental concern about desalination facilities is the potential for the impingement[11] and entrainment[12] of marine organisms during the intake of seawater. The MPWSP would utilize subsurface slant wells that would terminate 190 to 210 feet below the seafloor, eliminating the need for an open ocean intake. Subsurface intakes are thought to eliminate impingement impacts on marine biota by utilizing a broad surface of seafloor through which seawater is drawn at a slow rate (Foster et al, 2013). A Draft Staff Report prepared by the SWRCB in support of the proposed Ocean Plan amendment addressing desalination facilities notes:

> Subsurface intakes collect water through sand sediment, which acts as a natural barrier to organisms and thus eliminates impingement and entrainment (MWDOC 2010; Missimer et al. 2013; Hogan 2008; Pankratz 2004; Water Research Foundation 2011). This gives subsurface intakes a significant environmental advantage over surface (or open) water

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[10] Shear stress is a strain in the structure of a substance produced by pressure, when its layers are laterally shifted in relation to each other.

[11] Impingement occurs when organisms are trapped by the force of the flowing source water.

[12] Entrainment occurs when marine organisms enter the desalination plant intake, are drawn into the intake system, and pass through to the treatment facilities.

intakes because mitigation for surface intake entrainment will have to occur throughout the operational lifetime of the facility. (SWRCB, 2015)

The vertical infiltration rate at the seafloor for the proposed MPWSP was estimated by assuming the entire 24.1 mgd (3,222,000 cubic feet/day) of seawater required to operate the MPWSP plant would be drawn through the seafloor located directly above the screened segment of the slant wells. The length of shoreline spanned by intake slant wells would be approximately 2,000 feet. If the seafloor area of water intake extended 500 feet offshore, the area of seafloor through which seawater would be taken into the wells would be approximately 1,000,000 square feet. Through this area of seafloor, a maximum of 3,222,000 cubic feet (24.1 million gallons x 0.1337 cubic feet per gallon) of water would be pumped each day. The vertical infiltration rate through the seafloor would have to be 3.222 feet/day or 0.0000373 ft/sec (approximately 0.011 mm/sec). This calculation is very similar to the 0.000051 ft/sec (approximately 0.016 mm/sec) peak vertical infiltration rates estimated by Williams (2010) for the South Orange Coastal Desalination Project. In comparison, an open ocean intake equipped with a wedgewire screen would draw water in at a rate of 0.5 ft/sec (152.4 mm/sec). For the purposes of this assessment, it is assumed that the infiltration flow rate of seawater through seafloor sediments and into the slant wells would be approximately 0.011 to 0.016 mm/sec.

A review of published swimming speeds for plankton, larval invertebrates, and larval fish reveals that it is highly unlikely these small organisms would be impinged against the seafloor by vertical infiltration of seawater during operation of the subsurface slant wells. Studies of invertebrate plankton have found swimming speeds substantially exceed the estimated vertical infiltration rate for the MPWSP slant wells (see **Table 4.5-8**) by several orders of magnitude. Because squid spawning typically occurs on sand and mud seafloor habitats at depths much deeper than the intertidal zone where slant wells would be located, potential impacts on market squid eggs from slant well pumping would not occur. Therefore, no impingement from slant well operations is expected to occur.

TABLE 4.5-8
SWIMMING SPEEDS OF PLANKTON, INVERTEBRATES, AND LARVAL FISH

Source	Organism	Swimming Speed[a]
Franks (1992)	Phytoplankton and Protozoa	M = 0.2 mm/sec
Buskey et al (2002)	Pelagic copepod	M = 500 mm/sec
Browman et al (2011)	Pelagic copepod	M = 48.9mm/sec A = 34.3 mm/sec
Gallager et al (2004)	Pelagic copepods and protozoa	M = 12.9 mm/sec
Torres and Childress (1983)	Euphausiid	R = 2.2 – 15.8 mm/sec
Chan et al (2013)	Gastropod larvae	R = 0.5 – 3.5 mm/sec
Paris et al (2013)	Reef fish larvae	A = 14.5 mm/sec
Humphrey (2011)	Larval lake trout	M = 150 – 250 mm/sec
Fisher (2005)	Larval reef fishes	R = 200 – 600 mm/sec

NOTES:
[a] = M = Maximum reported swimming speed, A = Average reported swimming speed, R = Range of reported swimming speeds

Impingement of Organic Material on the Seafloor

Even though impingement of plankton and larval fish is not expected to occur from the intake of ocean water into the slant wells, the operation of the slants wells could impinge fine organic matter against the seafloor, cause a build-up and change the normal distribution of sediment grain size. The settlement of sediment particles is controlled by the size and density of the particles and the median grain size of ambient sediments is roughly proportional to local current speeds (Van Rijn, 2007; McCave, 2008). At infiltration rates greater than 30 cm/sec (0.98 ft/sec), seafloor sediments are very mobile and typically do not retain fine particle fractions (McCave, 2008). Various studies have documented that nearshore currents at the seafloor are dominated by the orbital velocities of waves. Graham et al (1997) reported estimated orbital velocities of ocean waters due to surface waves at three nearshore kelp forest sites around the Monterey Peninsula ranging between 500 cm/sec (16.4 ft/sec) and 280 cm/sec (9.2 ft/sec). Additionally, wave orbital velocities attenuate due to friction against the seafloor as the waves near the shore. Weltmer (2003) measured orbital velocities near the seafloor in the surf zone near Sand City between 250 cm/sec (8.2 ft/sec) and 600 cm/sec (19.7 ft/sec). Consequently, normal wave generated water velocities at the seafloor locations of the slant wells is predicted to be 8 to 20 times greater than that required for fine-grained material to accumulate on the seafloor over the subsurface slant wells. As a result, there would be no potential for the impingement of fine organic matter on the seafloor or changes to soft substrate habitat.

Potential Effects of Elevated Salinity

The desalination process would generate approximately 14 mgd of brine that would be discharged via the MRWPCA ocean outfall into the waters of MBNMS. The outfall is currently used to discharge secondary treated wastewater from the MRWPCA Regional Wastewater Treatment Plant. The comingling and discharge of this brine could have an effect on special-status species that frequent the study area (see **Table 4.5-1**), especially bottom dwelling or foraging fish, including MSA and state-managed commercial fish species (see **Table 4.5-4**) and marine mammals such as the Southern sea otter and California gray whale, that feed on benthic organisms. The discharged brine, if concentrated enough, could also result in the loss of foraging habitat if the benthic infauna and macrofauna populations decline. Additionally, comments received on the April 2015 Draft EIR expressed concerns over the potential for hypoxia[13] to occur near the seabed as a result of proposed MPWSP operational discharges. Specifically, there was concern that high salinity discharges from the MRWPCA outfall would restrict oxygen supply near the seabed and result in stress or mortality to benthic organisms and other marine biological resources. This issue is discussed in detail in Section 4.3, Surface Water Hydrology and Water Quality, and a summary of the impact conclusions is provided below.

As explained in detail in Section 4.3, the seawater in Monterey Bay is a mixture of water masses from different parts of the Pacific Ocean with warmer, saltier water from the equatorial zone and colder, fresher water from the arctic regions. Near-shore surface salinities vary from 33.2 practical salinity units (psu) to 34.0 psu when upwelling is strong. Streams and rivers can locally

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[13] Hypoxia, or oxygen depletion, is an environmental phenomenon where the concentration of dissolved oxygen in the water column decreases to a level that can no longer support living aquatic organisms. The impacts of hypoxia are often described as creating a so-called “dead zone” in the marine environment.

affect salinity, but even during flood conditions, when fresh water inputs to Monterey Bay peak, the salinity of Monterey Bay surface waters does not fall below 31 psu (MBNMS, 2013). Bograd and Lynn (2003) compared near-shore salinity and temperatures in Monterey Bay during two periods: 1950-1976 and 1977-1999, and found very little variation. The difference in near-shore salinities between the periods was approximately 0.2 parts per thousand (ppt) or psu and the difference in near-shore temperatures was approximately 1.4 °F. As such, the reported seasonal salinity and temperature is provided here as representative of baseline conditions. The 2015 Ocean Plan amendment established an allowable salinity increase of less than 2 ppt at the BMZ boundary (SWRCB, 2015). Exceeding this standard could result in a significant impact on fish and marine biota.

Dissolved Oxygen (DO) is typically used as a general index for the health of receiving waters (such as in the *Water Quality Control Plan for Ocean Waters of California* or Ocean Plan, discussed in Section 4.3.2.2). Adequate DO is vital for aquatic life and higher concentrations are generally considered to be desirable. Dissolved oxygen content in water is, in part, a function of water temperature and salinity, which affect the point at which water becomes saturated with DO. However, DO varies according to many other factors, including photosynthesis and biological and chemical oxygen demand associated with decomposition of organic material. Monterey Bay is a dynamic environment that includes variable concentrations of DO. Ambient DO levels in Monterey Bay at a depth of approximately 100 feet have ranged from 4.25 milligrams per liter (mg/L) to 8.00 mg/L (KLI, 1998, 1999); typically, DO in the range of 5 to 8 mg/L is considered protective of fish and marine biota depending on the species and life-stage. The Ocean Plan limits dissolved oxygen decreases as a result of operational discharges to no more than 10 percent from that which occurs naturally. Exceeding this standard for dissolved oxygen could result in a significant impact on fish and marine biota.

Elevated salinity and subsequent degradation of the marine environment are among the major concerns associated with coastal desalination projects (Damitz et al, 2006). Numerous studies have been performed to evaluate the effects of elevated salinity on marine organisms found within and outside of the study area in MBNMS, which have used different methods to test the sensitivity of various species. These studies have demonstrated that salinity effects are species-specific (see **Table 4.5-9**). Review of published results from field surveys and laboratory experiments (Roberts et al, 2010) indicate no studies have examined the impacts from the small range of salinity increases anticipated from the MPWSP desalination plant. As analyzed in detail in Section 4.3, except for the area adjacent to the discharge ports, the predicted salinity increase due to the MPWSP would be less than 2 ppt above ambient (increasing salinity up to 36.8 ppt) and the other studies tested organisms at much higher salinities. Moreover, there were apparent contradictions among different studies. For example, one field experiment cited by Roberts et al (2010) indicated reduced survival, shoot production, and vigor of seagrass transplants at salinities at or above 39.2 ppt (4 percent above ambient), whereas a laboratory experiment found another species of seagrass to have greatest growth and production at a salinity of 42.5 ppt. Although seagrass is not found in the study area, these conflicting results exemplify the limited applicability of data from other areas. A study of salinity effects based on approved marine organism toxicity test protocols (Phillips et al, 2012) reported median effect concentrations (EC50) ranging from 36.8 ppt to 61.9 ppt on various physiological processes (see **Table 4.5-10**).

TABLE 4.5-9
RESULTS FROM STUDIES ON THE EFFECTS OF ELEVATED SALINITY ON MARINE ORGANISMS

Author, Year	Species	Salinity Tested	Results	Comments
Pantell, 1993	*Menidia beryllina* (inland silverside)	23:1 SF Bay water:Brine 20:1 POTW Effluent:Brine	Mortality observed at greater brine concentrations	Freshwater species, dilutions of ambient samples tested without absolute salinities reported
	Skeletonema costatum (diatom)	23:1 SF Bay water:Brine 20:1 POTW Effluent:Brine	Growth effects observed at greater brine concentrations	Marine species, test salinities not reported
	Bivalve larvae	23:1 SF Bay water:Brine 20:1 POTW Effluent:Brine	Development effects observed at greater brine concentrations	Species not specified, dilutions of ambient samples tested without absolute salinities reported
	Citharichthys stigmaeus (sand dab)	23:1 SF Bay water:Brine 20:1 POTW Effluent:Brine	Mortality observed at greater brine concentrations	Local sand bottom species, dilutions of ambient samples tested without absolute salinities reported
Gross, 1957	*Pachygrapsus* (rock crab)	61 ppt 56 ppt	Lethal in 2 hours Survived > 72 hours	Locally found, but only in rocky habitats
	Emerita analoga (sand crab)	50 ppt 44 ppt	Lethal in 2 hours Survived > 24 hours	Local sand bottom species
	Olivella pycna (olive snail)	33 to 48 ppt	Not lethal	Local sand-bottom species, report unavailable for this evaluation
Iso et al, 1994	*Venrupis philippinarum* (little neck clams)	Various up 70 ppt	Survived and behaved normally at 50 ppt, lethal at 60 ppt after 48 hours and at 70 ppt after 24 hours	Grown commercially in California
	Pagrus major (sea bream)	Various up 70 ppt	Survived well in 45 ppt, behaved normally at 40 ppt, > 70 ppt lethal in 1 hour	Not found locally
	Pseudopleuronectes yokohamae (marbled flounder)	Various up 70 ppt	Egg hatching delayed but successful up to 60 ppt, larvae survived up to 50 ppt, 55 ppt lethal after 140 hours	Not found locally
McMillan and Mosely, 1967	Seagrass	Up to 74 ppt	Four species grew	No seagrasses in vicinity of proposed project, reference unavailable for this review
Pillard et al, 1999	*Mysidopsis bahia*	43 ppt	LC50 = 48 hours	Estuarine species
	Cyrpinidon variegates	70 ppt	LC50 = 48 hours	Estuarine species
	Menidia beryllina	44 ppt	LC50 = 48 hours	Estuarine species
Voutchkov, 2006	*Dendraster excentricus* (sand dollar)	37 to 40 ppt	Survived for 5.5 months, no effects on growth or fertility	Local sand-bottom species, reference unavailable for this review
	Strongylocentrotus purpuratus (purple urchin)	37 to 40 ppt	Survived for 5.5 months, no effects on growth or fertility	Local, but only in rocky habitats, reference unavailable for this review
	Haliotus rufescens (red abalone)	37 to 40 ppt	Survived for 5.5 months, no effects on growth or fertility	Rare locally, only found in rock habitats, reference unavailable for this review

TABLE 4.5-9 (Continued)
RESULTS FROM STUDIES ON THE EFFECTS OF ELEVATED SALINITY ON MARINE ORGANISMS

Author, Year	Species	Salinity Tested	Results	Comments
Reynolds et al, 1976	*Leuresthes tenuis* (California grunion prolarvae)	41 ppt	LC50 = 24 hours	Southern California species
	Leuresthes tenuis (larvae)	40 ppt	LC50 = 18 hours	Southern California species
SCCWRP, 1993	*Macrocystis pyrifera* spores (giant kelp)	43 ppt	Germination and growth not affected	Locally found, but not found for miles around the proposed project
	Rhepoxynius abronius (amphipod)	38.5 ppt	Survived 10 days	Local
	Strongylocentrotus purpuratus (purple urchin)	90:10 Seawater:Brine	No effect on fertilization	Local, but only in rocky habitats, test salinities not reported
Thessen et al, 2005	*Pseudo-nitzschia* spp. (diatom)	Up to 45 ppt	7 clones of 3 species grew up to 45 ppt	Local, species of *Pseudo-nitzschia* cause domoic acid poisoning

SOURCE: Pantell, 1993; Gross, 1957; Iso et al, 1994; McMillan and Moseley, 1967; Pillard et al, 1999; Voutchkov, 2006; Reynolds et al, 1976; SCCWRP, 1993; Thessen et al, 2005.

TABLE 4.5-10
TOXICITY TEST RESULTS AND MEAN EFFECTIVE CONCENTRATIONS OF SALINITY TOXICITY

Protocol	Physiological Process Measured	Test	Measured Test Solution Salinities	EC50[a]
Red Abalone	Development	1 2	34, 35, 36, 37, 38, 39, 40 34, 35, 36, 37, 38, 39, 40	36.8
Purple Urchin	Fertilization	1 2	34, 36, 38, 39, 41, 43, 45, 46, 48 34, 38, 41, 42, 43, 44, 45, 46, 47	44.2
Purple Urchin	Development	1 2	34, 35, 36, 37, 38, 39, 40, 41, 42 34, 35, 36, 37, 38, 39, 40, 41, 42	38.1
Sand Dollar	Fertilization	1 2	35, 38, 39, 41, 43, 45, 47, 48, 50 34, 36, 38, 40, 41, 43, 45, 46, 48	40.3
Sand Dollar	Development	1 2	34, 35, 36, 37, 38, 39, 40, 41, 42 34, 35, 36, 37, 38, 39, 40, 41, 42	39.6
Mussel	Development	1 2	34, 40, 41, 42, 43, 44, 45, 46, 47 35, 40, 41, 42, 44, 45, 46, 47, 48	43.3
Mysid Shrimp	Survival	1 2	35, 41, 45, 50, 56, 61 37, 42, 45, 49, 53, 56	47.8
Mysid Shrimp	Growth	1 2	35, 41, 45, 50, 56, 61 37, 42, 45, 49, 53, 56	> 49.7
Giant Kelp	Germination	1 2	34, 45, 49, 54, 59, 64 35, 44, 49, 54, 59, 65	55.5
Giant Kelp	Growth	1 2	34, 45, 49, 54, 59, 64 35, 44, 49, 54, 59, 65	47.3
Topsmelt	Survival	1 2	35, 45, 50, 55, 60, 65, 70 35, 44, 50, 54, 60, 65, 70	61.9
Topsmelt	Biomass	1 2	35, 45, 50, 55, 60, 65, 70 35, 44, 50, 54, 60, 65, 70	59.3

NOTE:
[a] EC50 = median salinity at which an effect was observed

SOURCE: Phillips et al 2012

Studies of salinity tolerances of organisms not within the context of toxicity tests also inform this analysis of potential impacts associated with brine discharge. In particular, market squid, *Doryteuthis (Loligo) opalescens* must be considered because their egg masses rest on the seafloor. A review by Vidal and Boletzky (2014) recommends a salinity range of 34 to 38 ppt for successful laboratory culture of the market squid. In an earlier publication, Boletzky (2004) suggested an ideal range of 32 to 38 ppt for most cephalopods. Thus, market squid appear to have a broad tolerance to salinity. Other species of concern (see Table 4.5-2) are motile and would be able to avoid areas of elevated salinity in the immediate vicinity of the brine discharge.

The 2015 Ocean Plan amendment established an allowable salinity increase of less than 2 ppt at the BMZ boundary (SWRCB, 2015); this is comparable to other international regulatory guidelines (see **Table 4.5-11**). This incremental salinity increase limit, however, is a conservative threshold for marine organisms, as none of the studies reviewed in the discussion above (see **Table 4.5-9**) found adverse effects on survival, growth, or behavior at salinities as low as the Ocean Plan objective. For this analysis, salinity levels both within the ZID (located between 3 to 11.9 meters or 10 to 39 feet from the diffuser depending on operating scenario; Table 4.5-12) and the BMZ (100 meters or 328 feet from the diffuser), as well as at the edge of these zones were evaluated for potential impacts on marine biological resources.

As presented in Section 4.3, Surface Water Hydrology and Water Quality, the highest anticipated ambient salinity of 33.89 ppt is expected to occur during the upwelling season (see **Table 4.3-1**). This peak ambient salinity would also coincide with the proposed project's maximum concentrated brine discharge stream, when the brine would not be combined with treated wastewater effluent from the MRWPCA regional wastewater treatment plant, resulting in the maximum salinity at the edge of the ZID of any scenario analyzed under Impact 4.3-4. Under this brine-only discharge scenario, the maximum increase in salinity at the edge of the ZID would be 1.6 ppt above ambient (see Scenario 2 and Scenario 15 in **Table 4.5-12**). This maximum anticipated salinity at the edge of the ZID due to the brine discharge is less than the lowest mean effective salinity reported by Phillips et al (2012) (i.e., 36.8 ppt; see **Table 4.5-10**). It should be noted that this mean effective salinity was for the embryonic development of red abalone, which occurs only on rocky substrate associated with kelp miles from the edge of the ZID. Moreover, none of the modeling results based upon a continuous discharge suggest a re-concentration of salinity in the discharged brine along the seafloor. Elevated salinities in the discharge plumes will never exceed 2 ppt above ambient at the point of contact with the seafloor and those maximum salinities will continue to dilute through mixing and diffusion as they flow across the seafloor.

Due to the fact that the recommended salinity range for culturing squid is 34 to 38 ppt, and the salinity at the edge of the ZID and the BMZ would not exceed 35.49 ppt and 35.23 ppt, respectively, the area outside the ZID and within the BMZ would continue to be suitable for squid spawning.

An area within the ZID, however, could be unsuitable for squid spawning. The most straightforward way of estimating the impact is to compare the area within the ZID to the entire area of suitable spawning habitat in Monterey Bay south of Monterey Submarine Canyon, which is the greatest focus of commercial fishing activities associated with spawning. The shelf area south of the Monterey Submarine Canyon is approximately 16 km (10 miles) long. The depth

TABLE 4.5-11
SUMMARY OF DOMESTIC AND INTERNATIONAL BRINE LIMITS

Region/Authority	Salinity Limit	Compliance Point	Source
USEPA	Increment ≤ 4 ppt	NA	NA
Carlsbad, CA	Absolute ≤ 40 ppt	1,000 feet	San Diego Regional Water Quality Control Board 2006
Huntington Beach, CA	Absolute ≤ 40 pt salinity (expressed as discharge dilution ratio of 7.5:1)	1,000 feet	Santa Ana Regional Water Quality Control Board 2012
Western Australia guidelines	Increment ≤ 5 ppt	NA	NA
Oakajee Port, Western Australia	Increment ≤ 1 ppt	NA	The Waters of Victoria State Environment Protection Policy
Perth, Australia/ Western Australia EPA	Increment ≤ 1.2 ppt and ≤ 0.8 ppt	50 m and 1,000 m	Wec 2002
Sydney, Australia	Increment ≤ 1 ppt	50 to 75 m	ANZECC 2000
Gold Coast, Australia	Increment ≤ 2 ppt	120 m	GCD Alliance 2006
Okinawa, Japan	Increment ≤ 1 ppt	Mixing zone boundary	Okinawa Bureau for Enterprises
Abu Dhabi	Increment ≤ 5 ppt	Mixing zone boundary	Kastner 2008
Oman	Increment ≤ 2 ppt	300 m	Sultanate of Oman 2005

SOURCE: Jenkins et al, 2012

TABLE 4.5-12
DILUTION MODEL RESULTS FOR DENSE DISCHARGE SCENARIOS

Scenario No.	Scenario	Predictions: SEA Dilution	Predictions: VP Dilution	Predictions: VP Distance (ft)	At impact (ZID): Dilution[a]	At impact (ZID): Salinity increment (ppt)	At BMZ: Dilution	At BMZ: Salinity increment (ppt)
Typical Discharge Scenarios								
1	SE Only	-	-	-	-	-	-	-
2	Brine only	15.4	16.2	10.2	15.4	1.61	18.5	1.34
3	Brine + Low (1) SE	16.0	16.1	10.4	16.0	1.31	19.2	1.09
4	Brine + Low (2) SE	16.8	17.6	11.6	16.8	1.05	20.1	0.88
5	Brine + Low (3) SE	17.7	18.5	12.7	17.7	0.83	21.2	0.69
6	Brine + Low (4) SE	18.8	19.5	13.8	18.8	0.64	22.5	0.54
7	Brine + Mod (5) SE	20.1	20.9	15.3	20.1	0.48	24.2	0.40
8	Brine + Mod (6) SE	21.9	22.2	16.8	21.9	0.35	26.3	0.29
9	Brine + Mod (7) SE	24.8	24.9	19.2	24.8	0.23	29.7	0.19
10	Brine + Mod (8) SE	28.2	27.5	21.9	27.5	0.15	33.0	0.12
11	Brine + Mod (9) SE	34.2	27.7	22.3	27.7	0.09	33.2	0.07
12	Brine + High (10) SE	46.7	39.2	33.0	39.2	0.02	47.0	0.02
13	Brine + High (15) SE	-	-	-	-	-	-	-
14	Brine + High (19.78) SE	-	-	-	-	-	-	-
High Brine Discharge Scenarios (post-shutdown operations)								
15	High Brine only	15.5	16.3	10.5	15.5	1.60	18.6	1.33
16	High Brine + Low (1) SE	16.1	16.9	11.3	16.1	1.34	19.3	1.11
17	High Brine + Low (2) SE	16.7	17.5	12.1	16.7	1.11	20.1	0.92
18	High Brine + Low (3) SE	17.5	18.4	13.1	17.5	0.91	21.0	0.76
19	High Brine + Low (4) SE	18.6	19.3	14.2	18.6	0.73	22.3	0.61
20	High Brine + Mod (5) SE	19.6	20.4	15.4	19.6	0.58	23.6	0.48
21	High Brine + Mod (6) SE	22.1	21.4	16.6	21.4	0.42	25.7	0.35
22	High Brine + Mod (7) SE	22.8	22.8	18.1	22.8	0.34	27.4	0.28
23	High Brine + Mod (8) SE	25.0	24.5	19.8	24.5	0.24	29.4	0.20
24	High Brine + Mod (9) SE	28.2	27.2	22.3	27.2	0.16	32.6	0.14
25	High Brine + High (10) SE	32.5	30.2	25.3	30.2	0.10	36.2	0.08
26	High Brine + High (12) SE	58.6	44.9	39.0	44.9	0.01	53.9	0.01
27	High Brine + High (14) SE	-	-	-	-	-	-	-
28	High Brine + High (16) SE	-	-	-	-	-	-	-

NOTES:

[a] The lowest dilution value was selected from the two model (SEA and VP) analysis results to calculate incremental salinity increases at the edge of the ZID and BMZ to provide the most conservative assessment of potential salinity increases.

SE = secondary effluent (MRWPCA wastewater)

SOURCE: Roberts, 2017 (Appendix D1)

ranges for squid spawning (18 to 55 meters or 59 to 180 feet) spans approximately 3 km (1.8 miles) from shoreward to seaward edge, which covers 48 square kilometers (18 square miles). If the area between the diffuser port and the edge of the ZID on both sides of the outfall (i.e., 3 to 11.9 meters ([10 to 39 feet] wide by 335 meters [1,100 feet] long; on two sides) were to settle on the seafloor (which model results indicate it would not), approximately 2,010 to 7,800 square meters of seafloor (21,635 to 85,800 square feet) would be unsuitable for squid spawning. This area represents approximately 0.0042 to 0.0163 percent of the suitable spawning area on the seafloor south of Monterey Submarine Canyon.

There could be unanticipated effects on benthic and pelagic communities in the vicinity of the discharge. As discussed in Section 4.3, Surface Water Hydrology and Water Quality, the water-column salinity at the point of discharge would exceed 2 ppt within a very small volume of ocean water at each of the 129 open diffuser ports. For the worst-case brine-only discharge scenario, the volume of discharge with a salinity greater than 2 ppt above ambient would be approximately 2 feet in maximum diameter tapering at each end, and approximately 8 feet long, with a corresponding volume of 8.5 cubic feet of water mass at each of the open diffuser ports (see **Figure 4.3-10** in Section 4.3, Surface Water Hydrology and Water Quality). Extrapolation to all 129 open diffuser ports indicates a total volume of 1,100 cubic feet of water could exceed 2 ppt. The small volume of water that would be greater than 2 ppt above ambient salinity would not come into contact with any hard-substrate organisms inhabiting the ballast rock anchoring the outfall or benthic fauna located on the seafloor. Consequently, benthic communities near the outfall would not be affected by the increased salinity brine discharge. Compared to the total volume of water surrounding the diffuser to a height of 4 feet off the bottom (i.e., 3 to 11.9 meters ([10 to 39 feet] wide by 335 meters [1,100 feet] long by 1.2 meters [4 feet] high; on two sides = or 2,412 to 9,568 cubic meters or 88,000 to 343,200 cubic feet), this impact would involve 0.3 to 1.25 percent of the near-seafloor water in the vicinity of the discharge and contain approximately 8.2 to 41.4 million planktonic organisms. While mortality of small organisms could occur if they were entrained for more than a few seconds in the discharge plumes, the impact on pelagic organisms would result in a less-than-significant impact because of the small percentage of total habitat involved.

The Ocean Plan establishes receiving water salinity limitations for brine discharges from desalination facilities to protect the quality of ocean waters for beneficial uses, such as providing aquatic habitat. The impact analysis at 4.3.5.2 Operational and Facility Siting Impacts Impact 4.3-4, uses the Ocean Plan's receiving water salinity limitations as significance thresholds. The impact analysis estimates salinity levels within the BMZ, where salinity may exceed 2.0 ppt above natural background salinity, to determine the potential frequency and intensity of impacts on marine biological resources and beneficial uses. The impact analysis evaluates the salinity and dilution dynamics of a number of scenarios of operational discharges within the BMZ by determining the ZID for each discharge scenario and describes areas where salinity would exceed 2 ppt. Additionally, the analysis addresses the fate and travel path of the discharge plume beyond the BMZ and the potential for hypoxia to occur near the seabed.

The analysis of salinity levels indicates that for all discharge scenarios, and assuming a continuous discharge stream, the MPWSP brine and combined discharges would meet Ocean

Plan salinity and dissolved oxygen standards and are not likely to result in hypoxia on the ocean floor. Specifically, the discharge would result in salinity less than 2 ppt above ambient salinity at the edge of the ZID, which means that salinity levels would not exceed 2 ppt above ambient salinity at the edge of the BMZ (328 feet) since the edge of the ZID is well within the BMZ under all scenarios. The proposed project would therefore not exceed or violate the Ocean Plan salinity standards or degrade water quality in terms of salinity. For all discharge scenarios involving dense, negatively buoyant plumes (worst case scenarios), the Ocean Plan salinity limit is met at the edge of the ZID, which ranges from 10 feet to 39 feet depending on discharge scenario. As the plumes discharged from each of the 129 outfall diffuser jets travel away from the ZID, they continue to dilute (further reducing salinity levels) and ultimately merge within the BMZ boundary. Salinity levels would exceed 2 ppt in a relatively small area, 8.5 cubic feet, adjacent to each of the 129 diffuser ports and above the seafloor, after which the discharge plumes would attenuate rapidly with distance from each port. The combined area of exceedances of 2 ppt is not likely to adversely impact the marine environment because it is a relatively small volume in the water column when considered in the context of the total volumes of Monterey Bay. Also, the salinity increases presented in the analysis represent conservative values and would occur only along the seabed. Modelling demonstrates that salinity plumes are not likely to travel, or become trapped, along the seafloor due to the Coanda effect. Hypoxia from salinity near the seafloor was demonstrated to be unlikely based on a mass-balance analysis, which demonstrated that the amount of oxygen supplied to the discharged plume by ambient seawater entrained during turbulent mixing and dilution is more than 30 times greater than that consumed by the sediments. As such, the concentration of dissolved oxygen in receiving ocean waters would not become depressed by more than 10 percent from that which occurs natural. For the majority of the water column, incremental salinities would be much lower than the reported values. Additionally, the analysis assumed zero ocean current; however, under actual ocean conditions, waves, tidal forces, and seasonal currents would increase mixing and dilution, thus reducing these assessed salinity levels. Therefore, operational discharges from the MPWSP would not increase salinity levels or impact DO in a manner that violates water quality objectives or waste discharge requirements or otherwise degrades the quality of receiving waters in Monterey Bay and MBNMS, and impacts on sanctuary marine biological resources would be less than significant.

Potential Effects of Other Brine Discharge Contaminants

In the irrigation season, brine-only would be discharged through the MRWPCA outfall. In the non-irrigation season, the brine would be combined with varying flows of secondary treated wastewater that would typically be buoyant when released into the ocean. But because the brine is denser than the wastewater flow, the brine could cause the wastewater to be less buoyant and various constituents in the wastewater may not adequately dilute as they do now.

To determine if exceedances of contaminants would occur in the discharge, the concentrations of constituents regulated under the Ocean Plan (**Table 4.3-4**) were calculated at the edge of the ZID using the modeled dilutions of various brine and brine-with-wastewater scenarios, and compared against the Ocean Plan water quality objectives (see Section 4.3 and Appendices D1-D3).

As discussed in detail in Section 4.3 (see Impact 4.3-5), the estimated concentrations for the full suite of Ocean Plan constituents are presented as concentrations at the edge of the ZID and as a percentage of the Ocean Plan numeric water quality objective in **Table A1** and **Table A2** in **Appendix D3** for the discharge scenarios assessed for the MPWSP (**Tables 4.3-13 and 4.3-14**). As summarized in **Tables A1** and **A2** (**Appendix D3**), out of 80 constituents assessed for compliance with Ocean Plan numeric water quality objectives, the proposed project would comply with 65 objectives under all assessed operational discharge scenarios. Two constituents, cyanide and ammonia, were identified as having the potential to exceed the Ocean Plan objectives under certain operational scenarios. Potential issues for cyanide and ammonia compliance were identified to occur when there would only be low volumes of secondary effluent flow mixed with desalination brine. These two constituents may exceed the Ocean Plan objective, or come close to exceeding the objective, and are shown at their estimated concentration at the edge of the ZID and as a percentage of the Ocean Plan numeric water quality objective at the edge of the ZID, in **Tables 4.3-15 and 4.3-16**, respectively. Ten constituents[14] were not detected in any of the source waters (desalination brine or wastewater) and results for these ten constituents are summarized in **Tables A1** and **A2** (**Appendix D3**). However, for these ten constituents, the analytical Method Reporting Limit[15] (MRL) achieved by the testing laboratory was higher than the Ocean Plan numeric objective (see Section 4.3, Surface Water Hydrology and Water Quality, for detailed discussion). Three additional constituents—acrylonitrile, beryllium, and TCDD equivalents—were detected in either the desalination brine or wastewater, but not in both. However, there is not enough information to assess the concentrations for these three constituents in the combined discharge of wastewater and brine due to differences in MRLs applied in the brine source waters as compared to the MRWPCA wastewater.

Based on a conservative assessment methodology (see Section 4.3), implementation of the MPWSP could potentially cause exceedances of Ocean Plan water quality objectives for the measurable constituents ammonia and cyanide. For an additional thirteen constituents, there is not enough information to assess concentrations at the edge of the ZID. Therefore, it is conservatively concluded that Ocean Plan water quality objectives could potentially be exceeded during operations for some operational discharge scenarios, resulting in a significant impact. **Mitigation Measure 4.3-5** (**Implement Protocols to Avoid Exceeding Water Quality Objectives**) would require CalAm to perform an extensive water quality assessment prior to implementation of the MPWSP. Operational discharges that cannot be demonstrated to conform to the Ocean Plan water quality objectives, incorporated as performance standards, may only be released following implementation of additional design features, engineering solutions, and/or operational measures that ensure compliance with objectives. With implementation of the proposed mitigation, the impact would be less than significant.

The modeled dilution factors for various scenarios of negatively buoyant plumes range from approximately 15:1 (seawater: effluent) to 59:1 at the edge of the ZID (Table 4.5-12).

[14] Chlorinated phenolics, 2,4-dinitrophenol, tributyltin, aldrin, benzidine, bis(2-chloroethyl)ether, 3,3-dichlorobenzidine, 1,2-diphenylhydrazine, heptachlor, 2,4,6-trichlorophenol.

[15] The lowest amount of an analyte in a sample that can be quantitatively determined with acceptable precision and accuracy under stated analytical conditions (i.e., the lower limit of quantitation).

Concentrations within the ZID (the area in the plume between its contact with the seafloor and the diffuser port) would be gradually higher than at the edge of the ZID. While mortality of small organisms could occur if they were entrained in the higher concentration discharge, the impact on pelagic organisms would result in a less-than-significant impact because of the small percentage of total habitat involved and the limited exposure duration. Discharged contaminants also would have less than significant impacts on benthic organisms due to acute toxicity because the area affected by the discharge plumes would be very small. Using the diameter of the discharge plumes cited above (i.e., 1.5 feet; see **Figure 4.3-10** in Section 4.3, Surface Water Hydrology and Water Quality), each plume would affect 1.77 square feet of seafloor at the point of contact. The total area affected would be 1.77 square feet x 129 open diffuser ports = 228 square feet. This area is less than 1 percent of the total area within the ZID (i.e., 1,100 feet long x 21 feet wide = 23,100 square feet). Transfer of bioaccumulated contaminants from benthic infauna to higher trophic levels also would be limited by the very small area of seafloor affected. Transfer to predators in higher trophic levels would be proportional to the relative consumption of prey from within and outside of the affected seafloor area.

As discussed in Section 4.3, the implementation of **Mitigation Measure 4.3-4** (**Operational Discharge Monitoring**, **Analysis, Reporting**, **and Compliance**), would further ensure that brine constituents are discharged at concentrations below Ocean Plan requirements and further ensure compliance with the monitoring requirements and regulatory standards that are protective of the beneficial uses (including aquatic wildlife and habitat) of Monterey Bay. Mitigation Measure 4.3-4 requires CalAm to implement a comprehensive Monitoring and Reporting Plan (Plan), following review and approval by the RWQCB and MBNMS, that is consistent with the requirements of the Ocean Plan and that incorporates, at a minimum (but not limited to), monitoring guidelines detailed in the Ocean Plan. The monitoring program would ensure that adequate water quality and marine resource data are gathered to determine baseline conditions and compliance with Ocean Plan water quality limitations. The Plan includes, at a minimum, appropriate performance standards, as well as corrective actions to be implemented (detailed in **Mitigation Measure 4.3-5, Implement Protocols to Avoid Exceeding Water Quality Objectives)**, such as retrofitting the existing outfall to increase dilution, additional pre-treatment of source water to the Desalination Plant, treatment of discharge, and/or flow augmentation, that would be required if the acquired data indicated non-compliance with Ocean Plan water quality objectives (or NPDES permit conditions) resulting from operational discharges. Impacts due to the discharge of other brine contaminants would be less than significant.

Potential Effects of Brine Discharge Shear Stress

Concern has been expressed that the jet velocities associated with brine discharges could cause damage in the discharge environment (SWRCB, 2014). Impacts due to shear stress caused by the brine discharge would be limited to plankton, because motile organisms would be able to avoid turbulence in the immediate vicinity of the brine discharge. Some laboratory studies have reported impacts on very small marine organisms caused by experimentally induced shear stress (Foster et al, 2013). In the case of the proposed MPWSP, such damage is highly unlikely. Modeling performed in support of a report submitted to the SWRCB that examined entrainment effects from desalination projects (Foster et al, 2013) provided formulae for determining the spatial scales of turbulent eddies that occur at different discharge velocities.[16] The minimum and maximum discharge velocities (7.4 ft/sec (2.26 m/sec) and 14.8 ft/sec (4.51 m/sec)) modeled across all scenarios for the proposed MPWSP (see Appendix D1) closely approximate the discharge velocities calculated by Foster. Foster (2013) concludes that, at these very small eddy scales: "Overall, the area of high shear impacted by the diffusers is relatively small and transit times through this region relatively short. Thus, it seems reasonable to expect that, while the larvae that experience the highest shear will most likely experience lethal damage, the overall increase in mortality integrated over the larger area will be low."

Plankton samples collected near the MRWPCA outfall (see **Table 4.5-1**) were used in a hydrodynamic model to provide a quantitative estimate of the effects of shear stress from the brine discharge on plankton (**Appendix D1**). The analysis found that a very small percentage of water passing over all of the outfall diffusers is entrained (i.e., 1.7 to 6.4 percent). The greatest shear gradients occur in very small turbulent eddies such that effects of shear stress would be concentrated on plankton smaller than 1.0 mm. Assuming that 50 percent of entrained organisms below 1 mm are killed by shear stress, roughly 0.23 to 0.86 percent of total numbers of plankton flowing over the diffuser could be killed by shear stress, estimated to be roughly 892 million organisms per day. This number seems substantial, but is a tiny fraction of the estimated total plankton abundances at any point in time in Monterey Bay.

The total area around the edge of Monterey Bay at the depth of the MRWPCA diffuser is approximately 215 square kilometers and the average depth is 35 meters. By applying the average number of planktonic organisms per cubic meter observed in the plankton tows (see Table 4.5-1; 4,357 organisms per cubic meter), the total number of organisms in the nearshore area of Monterey Bay would be 3.41×10^{13} at any given time. The percentage of total nearshore plankton killed in Monterey Bay by shear stress associated with the discharge of brine from the MPWSP project each day would be 0.00261 percent. The amount of annual organism productivity represented by this percentage can only be approximated because the numbers present on any given day, as indicated by the plankton samples, are the result of production minus predation and natural mortality, which are unknown. Nevertheless, a rough approximation is possible. Calanoid copepods, which were the most abundant organisms in the plankton samples (see Table 4.5-1), typically have annual lifecycles (Atkinson, 1998). If it can be assumed that all calanoids begin and end their lifecycles at the same time, a mortality of 0.00261 percent per day would result in a maximum annual loss of less than 1 percent. Moreover, because the baseline condition involves wastewater without brine, the higher wastewater flow in the non-irrigation season means that the water entrained over the ZID is greater and potential plankton mortality is greater with these higher flows than would be the case with the proposed project.

[16] Foster concludes that higher strain rates and shear stresses are contained in smaller eddies. A discharge velocity of 2.9 m/sec (9.5 ft/sec) resulted in small eddies ranging from 0.03 mm (0.002 in) to 0.56 mm (0.02 in) at various locations in the discharge plume, from the diffuser port to the edge of the ZID. A discharge velocity of 4.6 m/sec (15.1 ft/sec) resulted in small eddies ranging from 0.02 mm (0.0008 in) to 0.63 mm (0.025 in).

Impact Conclusion

Impacts on marine biological resources, including MBNMS resources, during operations of the proposed MPWSP would be less than significant. Impingement of plankton, larval fish and other organic matter on the seafloor from the operation of the slant wells is not likely because of the low intake velocities. The increased salinity and other constituents in the brine discharge are expected to meet Ocean Plan water quality objectives at the edge of the ZID and are therefore, not expected to cause any impairments to marine biological resources including special status species. Brine discharges also are not expected to significantly affect marine habitat by reducing dissolved oxygen content (hypoxia). Nevertheless, and as discussed in Section 4.3, Surface Water Hydrology and Water Quality, the implementation of **Mitigation Measure 4.3-4** would further ensure the brine is discharged at concentrations below Ocean Plan water quality objectives and further ensure compliance with the monitoring requirements and regulatory standards that are protective of the beneficial uses (including aquatic wildlife and habitat) of Monterey Bay.

Impacts due to shear stress caused by the brine discharge would be limited to plankton, because motile organisms would be able to avoid turbulence in the immediate vicinity of the brine discharge and the impact would be less than significant because of the small percentage of plankton abundances potentially affected. Moreover, the Ocean Plan Provisions for Desalination Facilities require modeling and estimating of potential mortality due to shear stress entrainment, and require periodic re-evaluation to ensure the operational procedures employed result in acceptable plankton mortality (SWRCB, 2016).

Because there is little risk that benthic infauna and macrofauna populations will decline due to impingement, shear stress, and increased salinity, impacts are not anticipated on fish, marine mammals (such as the Southern sea otter and California gray whale), seabirds, and other species. Transfer of bioaccumulated contaminants from benthic infauna to higher trophic levels also would be limited by the very small area of seafloor potentially affected. Transfer to predators in higher trophic levels would be proportional (e.g., very limited) to the relative consumption of prey from within and outside of the affected seafloor area. Therefore, the indirect impacts on fish, marine mammals, sea birds, and other species are also determined to be less than significant.

Mitigation Measures

None proposed.

Impact 4.5-5: Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels during operations. (*Less than Significant)*

As discussed for Impact 4.5-4, there are no anticipated occurrences of impingement of plankton and larval fish on the seafloor or a potential for deterioration of seafloor sediments and soft substrate benthic habitat from the operation of the MPWSP slant wells. Additionally, the discharge of elevated salinity brine is not expected to threaten to eliminate a marine plant or animal wildlife community or cause a marine population to drop below self-sustaining levels. Therefore, the evaluation of impacts from MPWSP operations, including slant well and brine discharge operations, would be the same as for Impact 4.5-4; the impact would be less than significant.

Mitigation Measures

None proposed.

Impact 4.5-6: Interfere substantially with the movement of any native marine resident or migratory fish or marine wildlife species or with established native resident or migratory marine wildlife corridors, or impede the use of native marine wildlife nursery sites during operations. (*Less Than Significant)*

As discussed for Impact 4.5-4, there are no anticipated occurrences of impingement of plankton and larval fish on the seafloor or a potential for deterioration of seafloor sediments and soft substrate benthic habitat from the operation of the MPWSP slant wells. The analysis of impacts on the movement of native resident or migratory fish or marine wildlife species, including market squid, or interference with established native resident or migratory wildlife corridors or native marine wildlife nursery sites is identical to the analysis presented for **Impact 4.5-4**.

Additionally, the discharge of brine is not expected to interfere with the movement of native resident or migratory fish or marine wildlife species. Therefore, the evaluation of impacts from MPWSP operations, including slant well and brine discharge operations, would be the same as for Impact 4.5-4; the impact would be less than significant.

Mitigation Measures

None proposed.

4.5.6 Cumulative Effects of the Proposed Project

Impact 4.5-C: Cumulative impacts on marine biological resources. (*Less than Significant*)

The geographic scope for the cumulative analysis of impacts on marine biological resources encompasses the nearshore waters (within 5 miles from shore) of Monterey Bay and extends from north of Moss Landing Harbor southward to the northern limits of Sand City, including the subtidal and intertidal habitats contained therein, and all marine biological communities. Beyond this area, other projects would be too distant from the MPWSP to result in any combined salinity or elevated brine constituent plumes, or to combine in any other way that may cause a cumulative effect on marine biological resources.

As discussed in Section 4.3.6, MBNMS was notified on Saturday, January 20, 2018, of a sewage spill into MBNMS from the Monterey Regional Water Pollution Control Agency (MRWPCA) wastewater treatment facility. MRWPCA reported that the spill resulted in the release of approximately 2.8 million gallons of untreated sewage entered Monterey Bay. While sampling and information collection regarding the extent and potential impacts of the spill is ongoing, there have been no reported impacts on marine organisms or habitats. If any impacts are found, those would likely be localized and the incident therefore, is not anticipated to have any long-term residual impact on the marine biological resources in Monterey Bay in the year 2021 that would affect or change the EIR/EIS conclusion of impacts on marine biological resources resulting from implementation of the proposed project.

The cumulative projects listed in **Table 4.1-2** that are located within the geographic scope and whose impacts could overlap with those of the MPWSP include Test Slant Well (No. 47), RUWAP Desalination Element (No. 31), and RUWAP Recycled Water Element (No. 35). In addition, it is expected that either the DeepWater Desal Project (No. 34) or The People's Moss Landing Desal Project (No. 57), but not both, would be constructed and operated in the reasonably foreseeable future. With the exception of DeepWater Desal and People's Project, all of these projects are either built (No. 47), not reasonably foreseeable in its current configuration (No. 31), or projected to have very localized construction impacts.

The test slant well (No. 47) was considered in the evaluation of the proposed project. The RUWAP Recycled Water Element (No. 35) would reduce wastewater flows to the MRWPCA ocean outfall. The impacts that would result from a range of brine with wastewater flows were evaluated for the proposed project under Impact 4.5-4 (see Table 4.5-12). Therefore, the cumulative scenario that would result from the RUWAP Recycled Water Element in combination with the proposed project would be within the range of brine with wastewater flows analyzed under Impact 4.5-4; that impact was determined to be less than significant.

Both the DeepWater Desal and People's Project propose to use new ocean water intakes and new brine discharge outfalls equipped with diffuser jets. The proposed intake and outfall pipes for both projects would be located offshore of Moss Landing Harbor. As proposed by its applicant, the People's Project would develop supplemental water supplies to serve customers in CalAm's Monterey District service area. Since the People's Project and the MPWSP would not both be implemented to serve the same customers, this EIR/EIS assumes the People's Moss Landing Project is an alternative to the MPWSP (see Chapter 5). Therefore, it is not a reasonably foreseeable project in the cumulative scenario relevant to the MPWSP. It would also not be a reasonably foreseeable project in the cumulative scenario for any of the alternatives aimed at meeting the objectives of the MPWSP. Therefore, although acknowledged here as a reasonably foreseeable alternative to the proposed project (as described in Chapter 5), this project's contributions to cumulative impacts are not considered as part of the cumulative scenario relevant to the proposed project or another alternative. In contrast, DeepWater Desal Project is considered in the cumulative impacts analysis for the MPWSP because the project proponent has indicated that it intends to proceed even if another desalination plant is selected to serve the Monterey Bay region. DeepWater Desal would include the construction and operation of a seawater desalination facility and co-located data center to provide up to 25,000 afy of potable water and data transmission and storage services. DeepWater Desal would be developed to meet a regional need for water, and CalAm would be one of several customers of the supply. As such, DeepWater Desal is considered in the cumulative effects scenario for the MPWSP. See Section 4.1 for additional details on the cumulative scenario and the basis for this determination.[17]

Construction Impacts

The proposed MPWSP would use subsurface slant wells in-lieu of an open ocean intake. As a result, there are no anticipated or proposed construction activities within the coastal waters of the MPWSP project area that are expected to result in disturbance or effects on marine biological resources. As discussed in Impact 4.5-1, potential impacts from construction-related underwater noise, the discharge of clarified water produced during well drilling and well development into the ocean, and the potential accidental release of drilling fluids would result in less-than-significant impacts on marine biological resources and habitats. Because any drilling noise reaching ocean waters overlying the slant wells is expected to be below background underwater noise levels, the lack of noise generated by slant well drilling could not combine with other sources of underwater noise generated by projects in the cumulative scenario to result in increased noise above ambient levels. The Deepwater Desal project would also involve offshore construction, but the Deepwater Desal intake and discharge facilities would be constructed approximately 6.5 miles to the north, and possibly years later than the MPWSP; therefore, noise would not accumulate with the proposed project's construction noise. The discharge of any clarified water to the ocean would be in compliance with Ocean Plan Water Quality standards for turbidity as stipulated in the revised NPDES permit. The NPDES permit requirements are themselves measures based, in part, on the consideration of cumulative effects on receiving waters; therefore, discharges of the proposed project when combined with discharges from the DeepWater Desal project would be within parameters considered not to result in a cumulatively significant effect on water quality.

Impingement of Marine Organisms and Organic Material on the Seafloor

While Deepwater Desal is expected to have a high impingement risk due to its open water intake design, the MPWSP's impingement risk is low and is not likely to incrementally increase the impingement risks caused by Deepwater Desal. As discussed under Impact 4.5-4, no impingement or entrainment of fish or invertebrate species would occur during MPWSP operations because the use of slant wells would result in a vertical infiltration rate that would be well below the swimming speeds of larval invertebrates and larval fish. Similarly, the low infiltration rate of the slant wells would not result in an accumulation of fine-grained organic materials on the seafloor. Therefore, the MPWSP could not contribute to any cumulative impacts related to the impingement or entrainment of fish or invertebrate species, or the impingement of fine organic matter.

Discharge of Brine and Other Brine-Associated Constituents

As discussed in Impact 4.5-4, the MPWSP would discharge a brine solution with an elevated salinity concentration as well as potentially elevated concentrations of contaminants to the ocean through the existing MRWPCA ocean outfall. Based on a conservative assessment methodology (see Section 4.3), implementation of the MPWSP could potentially cause exceedances of Ocean

[17] As explained in Section 4.1, the MPWSP assumes that GWR would not be operational, and as such, GWR is not considered in the cumulative impacts scenario.

Plan water quality objectives for the measurable constituents ammonia and cyanide. For an additional thirteen constituents, there is not enough information to assess concentrations at the edge of the ZID. The constitution of the brine that would be discharged from the DeepWater Desal project is currently unknown but this analysis assumes that, at a minimum, contaminants detected in the ocean water (CCLEAN, 2015) that currently exceed Ocean Plan water quality objectives (PCBs) would in all likelihood also exceed Ocean Plan water quality objectives at the edge of the DeepWater Desal ZID. If there are no operational actions available for dilution of the brine from the DeepWater Desal project, or feasible mitigation actions to reduce potential increased PCB concentrations, and therein reduce the potential impact on pelagic marine biological resources, then the potential impact on marine biological resources inhabiting pelagic habitat within the ZID of the DeepWater Desal project would be significant and unavoidable.

The DeepWater Desal project, in order to be viable and permitted, would have to implement operational actions that ensure its brine discharges also achieve the Ocean Plan water quality objectives. The distance between the DeepWater Desal proposed outfall and the existing outfall proposed for use by the MPWSP (i.e., 31,511 feet; 9,605 meters; 5.96 miles) leads to the determination that there is no expectation of the two BMZs reaching each other or intermixing discharge waters. The area within the BMZ for the MPWSP that could exceed 2 ppt is estimated at a total volume of approximately 31 cubic meters (1,100 cubic feet) of pelagic habitat and associated marine taxa, including special status fish, invertebrate, and marine mammal species. Since the DeepWater Desal project proposes to discharge more brine than the MPWSP, its BMZ would be larger than that of the MPWSP. Depending on operating conditions, the DeepWater Desal project could result in approximately 150 to 1,500 cubic meters (5,300 to 53,000 cubic feet) of pelagic habitat exceeding 2 ppt around the diffuser structure. Thus, the potential cumulative area of coastal Monterey Bay pelagic habitat affected by salinity exceeding 2 ppt could be up to approximately 1,532 cubic meters (54,100 cubic feet) depending on operating conditions, which it is an infinitesimally small amount of water when compared to the volume of nearshore pelagic habitat in the study area (i.e., 215 square kilometers x 35 meters average depth = 7.5 billion cubic meters or 265 billion cubic feet). Therefore, based on the comparative scale of the volume of pelagic habitat that could exceed 2 ppt salinity as compared to the nearshore pelagic habitat available in Monterey Bay, there would be no significant cumulative impacts in Monterey Bay regardless of other external stressors. Monterey Bay in MBNMS is resource rich (not resource constrained) and most special status fish, invertebrates, and marine mammal species that would encounter the increased area of salinity are motile, they would behaviorally avoid the area and would find other areas to inhabit. Therefore, the cumulative effect of the two projects from increased salinity concentrations in their brine discharges on marine biological resources, including special status fish, invertebrates, and marine mammal species, would be less than significant.

However, the proposed MPWSP discharge could be out of compliance with the Ocean Plan for cyanide and ammonia and for an additional thirteen constituents, there is not enough information to assess concentrations at the edge of the ZID. The implementation of **Mitigation Measure 4.3-4 (Operational Discharge Monitoring, Analysis, Reporting, and Compliance)** would ensure that brine constituents from the MPWSP, such as cyanide and ammonia, are discharged at concentrations below Ocean Plan requirements and would result in a less than significant contribution to a cumulative impact related to cyanide and ammonia. Since the MPWSP would be using subsurface intakes, the PCBs drawn into the source water through the ocean floor would be less than ambient ocean water and would not exceed Ocean Plan objectives at the edge of the ZID. Thus, the MPWSP would have a less than significant contribution to a cumulative impact related to PCB concentrations.

Brine Discharge Shear Stress

As discussed in Impact 4.5-4, impacts on marine organisms caused by shear stress would be concentrated on plankton smaller than 1.0 mm and would be less than significant (0.00261 percent of nearshore planktonic organisms killed). At present, only a preliminary assessment of potential shear stress impacts on planktonic organisms has been performed for the DeepWater Desal project. However, the assessment of potential brine discharge effects on planktonic organisms relative to the volume of the MPWSP brine discharge (Impact 4.5-4) can be used as a basis for estimating similar impacts from the DeepWater Desal project. If the MPWSP and DeepWater Desal were both built and operated, DeepWater Desal is estimated to have a brine discharge of approximately 27 mgd, in comparison to the MPWSP's 14 mgd brine discharge. Assuming that the DeepWater Desal diffuser jets would cause no greater shear impact than the diffusers used on the MRWPCA outfall, DeepWater Desal brine discharges are estimated to cause plankton mortality rates of approximately 447 million individuals per day, assuming plankton densities similar to those measured at the MRWPCA outfall (see Table 4.5-1). As a result, the estimated potential cumulative effect of brine discharge shear stress on planktonic organisms less than 1 mm in size would be approximately 3.8 billion planktonic organisms per day or 0.011 percent of the potential nearshore plankton in Monterey Bay, a small fraction of the plankton less than 1 mm in size inhabiting the nearshore waters near the ocean outfalls. Additionally, the Ocean Plan water quality objectives for brine discharges require modeling and estimating of potential mortality due to shear stress entrainment and require periodic re-evaluation to ensure the operational procedures employed result in acceptable plankton mortality (SWRCB, 2016). No significant cumulative impact from brine discharge shear stress would occur as a result of the MPWSP and DeepWater Desal project.

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4.6 Terrestrial Biological Resources

This section analyzes the potential for the Monterey Peninsula Water Supply Project (MPWSP or proposed project) to adversely affect biological resources and prescribes mitigation to reduce significant impacts. This section describes terrestrial biological resources in the Monterey region and provides detailed information regarding the resources that exist, or have the potential to exist, within a 50-foot buffer of the project area (the study area for terrestrial biological resources). The resources described include vegetation communities and associated wildlife, wetlands and other water bodies, freshwater and anadromous fisheries, and special-status plants and wildlife (federally and state-endangered, threatened, proposed, and candidate species; and state and local species of concern). Impacts on marine biological resources are discussed separately in Section 4.5, Marine Resources.

The CPUC received several comments pertaining to terrestrial biological resources during the public review period for the April 2015 Draft EIR. Comments on the April 2015 Draft EIR suggested that mapping of biological resources was at a scale that made it difficult to read or distinguish vegetation or wildlife habitat types, and that information on special-status species occurrences should have been included. New maps have been included in this EIR/EIS (See Appendix F) based on more detailed vegetation and habitat mapping that has been completed since the Draft EIR was published. Descriptive information about vegetation and wildlife habitats and special-status species is in Section 4.6.1.4 through Section 4.6.1.10.

Comments indicated that protocol surveys should have been included in the Draft EIR. Although this is not a CEQA or NEPA requirement, such surveys have been completed as part of the permitting process, and the results are reflected in Sections 4.6.1.8, Special-Status Species, and 4.6.1.9, Critical Habitat, of this EIR/EIS.

Comments suggested that the Draft EIR provided insufficient or deferred mitigation with regard to impacts on some biological resources, including special-status plants and silvery legless lizard. Mitigation measures in Sections 4.6.5.1 (Construction Impacts) and 4.6.5.2 (Operational and Facility Siting Impacts) have been revised based on input from regulatory agencies and improved species information resulting from more extensive surveys of biological resources. Mitigation for species listed by the state of California as Fully Protected Species also is addressed in these sections.

Several comments on the Draft EIR concerned use of western snowy plover occurrence data in the vicinity of the proposed subsurface slant wells, status of western snowy plover in the vicinity of this facility, and potential impacts of this facility on plovers. ESA requested western snowy plover occurrence data from Point Blue Conservation Science, but Point Blue Conservation Science was unable to provide this data prior to publication of this EIR/EIS. This EIR/EIS includes additional information and analysis in regards to western snowy plover in Sections 4.6.5.1 (Construction Impacts) and 4.6.5.2 (Operational and Facility Siting Impacts).

Comments on the Draft EIR suggested that impacts of reduced pumping on the riparian habitat of the Carmel River should be analyzed. This EIR/EIS concluded that since a primary purpose of the proposed project is to reduce pumping from the Carmel River to restore and increase flows, the effect of this project would be a beneficial effect on stream flows in the Carmel River and the river's aquatic and riparian biological resources. This is discussed further in Sections 4.3 (Surface Water Hydrology and Water Quality, and Section 4.6.1.2 (Information Sources and Survey Methodology).

Several comments on the Draft EIR were concerned with consistency of the proposed project with a mitigation monitoring plan for the CEMEX facility. This EIR/EIS relies on impact assessments and mitigation approaches developed in coordination with regulatory agencies taking current biological resource conditions into consideration. Comments on the Draft EIR also assert that no jurisdictional wetlands or other waters of the U.S. or of the state occur within the CEMEX property. This EIR/EIS continues to regard surface waters within the study area as potentially jurisdictional, except where noted in the discussion below, pending a jurisdictional determination made by the U.S. Army Corps of Engineers, Central Coast Regional Water Quality Control Board, or other regulatory agencies.

Comments on the Draft EIR also indicated that portions of the proposed project that would occur within Fort Ord Dunes State Park will require permits, coordination, and need to conform to a pending Habitat Conservation Plan (HCP) being prepared by FORA. Consistency of the proposed project with the existing HMP and Draft HCP is discussed in Sections 4.6.2.2, 4.6.5.1, and 4.6.5.2 of this EIR/EIS.

Comments received on the Draft EIR concerned with local coastal planning issues requested that City of Marina Local Coastal Land Use Plan (LCLUP) primary and secondary habitat studies should be completed and these areas are mapped, and that the proposed project should be consistent with LCLUP. Information on consistencies of habitat studies is in Sections 4.6.1.4, Vegetation Communities and Wildlife Habitats, 4.6.1.5, Sensitive Natural Communities, and 4.6.1.6, Wetlands and Other Waters. Information on LCLUP consistency is in Table 4.6-4 in Section 4.6.2.3, Local Regulations, and in Section 4.8, Land Use, Land Use Planning, and Recreation. Comments on the Draft EIR also recommended analysis of the effect of extraction wells on coastal dune and ESHAs. Information on the zone of influence of the extraction wells is located in Section 4.4, Groundwater Resources.

Some comments expressed concern about the authority of the Lead Biologist designated in the mitigation measures presented in the Draft EIR, and the role of that individual relative to the project proponent. This is further described in Section 4.6.5.2 under Mitigation Measure 4-6.1a.

As a result of comments received on the January 2017 Draft EIR/EIS, revisions have been made to this EIR/EIS section. Those changes include:

- *Update to the definition of listed special-status species to include those species listed as rare by the California Fish and Game Commission.*
- *Addition of the fully protected species category pursuant to the California Endangered Species Act.*
- *Addition of a description of the state and local definitions of Environmentally Sensitive Habitat Areas (ESHA) and the City of Marina Local Coastal Land Use Plan's (LCLUP) definition of primary and secondary habitat, a revision to the description of where ESHA and primary and secondary habitats would occur within the study area based on guidance from representatives from the California Coastal Commission (CCC), and maps of where potential ESHA occurs in the study area. Based on this revised description of where ESHA and primary and secondary habitats would occur, the Final EIR/EIS added a preliminary estimate of the acreage of ESHA (and primary or secondary habitat as applicable) that would be impacted from the proposed project. Revisions to Mitigation Measure 4.6-2b reflect these changes.*
- *Revision to the discussion of wetlands and waters of the U.S. and waters of the state to state that in the absence of a verified wetland delineation by the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and CCC, this document assumes that all potential jurisdictional features identified in surveys described in this document and by the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) may be considered jurisdictional by the USACE, RWQCB, and CCC.*
- *Addition of an analysis of potential impacts on globose dune beetle and Salinas kangaroo rat, which are identified as rare and endangered species in the City of Marina's LCLUP.*
- *Revisions to Table 4.6-2 (Special-Status Species with the Potential to Occur at Project Facilities) to move Pacific Grove clover, a state rare species, under the header of federal or state listed species.*
- *Addition of discussion of potential impacts from spreading the subsurface slant well drilling spoils within the subsurface slant well construction area.*

- *Revisions to some mitigation measures that have language such as "to the extent feasible" or "when feasible" or "to the extent practicable" to either remove that language or ensure the measure has a two-tiered approach to mitigate impacts.*
- *Revisions to some mitigation measures to: clarify that compensatory mitigation for maintenance of the subsurface slant wells would only be applied once and not every five years; add success criteria and performance standards to ensure that the mitigation component would reduce impacts to less than significant, and; add specific performance standards for restoration and compensation areas and methods for mitigating the impacts.*
- *Revision to Mitigation Measure 4.6-1e (Avoidance and Minimization Measures for Special-status Plants) to require a minimum 2:1 compensation ratio for permanent impacts, clarify the options for compensation, and include specific performance standards.*
- *Revisions to Mitigation Measure 4.6-1p (Control Measures for Spread of Invasive Plants) to state that, within U.S. Army-owned land, control measures for invasive species shall also conform to guidelines in the Integrated Natural Resource Management Plan (INRMP) Presidio of Monterey and Ord Military Community (e.g., Section 9.2.4, Undesirable Plant Pests).*
- *Revision of Impact 4.6-C to include a general description of the amount of sensitive habitat that may be disturbed by the cumulative projects and to include the total acreage of impacts that the proposed project may have on sensitive habitat types.*

4.6.1 Setting/Affected Environment

4.6.1.1 Definitions

Project area refers to the area where all construction-related disturbances would occur. All permanent footprints of the proposed facilities are within the project area.

Study area encompasses a 50-foot buffer around the project area. A 50-foot buffer around the project area was established as the survey area to ensure biological resources within the project area and immediate adjacent vicinity were assessed for potential direct and indirect project impacts. Reconnaissance-level biological field surveys conducted for the proposed project were generally consistent with the study area, with some exceptions (described in Section 4.6.1.2, below).

Special-status biological resources include special-status plants and animals,[1] sensitive natural communities, wetlands, and other waters of the United States and of the state, as defined by the U.S. Army Corps of Engineers (USACE), the U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Services (NMFS), the California Department of Fish and Wildlife (CDFW), the California Coastal Commission (CCC), the California Regional Water Quality Control Board (RWQCB), and the California Native Plant Society (CNPS).

[1] Several species known to occur within the general project area are accorded "special-status" because of their recognized rarity or vulnerability to habitat loss or population decline. Some of these species receive specific protection in federal and/or state endangered species legislation. Others have been designated as "sensitive species" or "species of special concern" on the basis of adopted policies of federal, state, or local resource agencies. These species are referred to collectively as "special-status species."

Special-status plant and animal species are defined as:

- Species listed under the Federal Endangered Species Act (FESA), Marine Mammal Protection Act, California Endangered Species Act (CESA), California Fish and Game Code, or Native Plant Protection Act as endangered, threatened, or depleted; species that are candidates or proposed for listing; or species that are designated as rare, species of special concern, or Fully Protected.
- Locally rare species defined in the CEQA Guidelines, which may include species that are designated as sensitive, declining, rare, or locally endemic, or as having limited or restricted distribution by various federal, state, and local agencies, organizations, and watch lists. This includes species ranked as California Rare Plant Rank (CRPR) 1A, 1B, 2A, 2B, 3 or 4 by the CNPS.[2]

Special-status plant and animal species are categorized as either listed or non-listed. Listed special-status species refers to those species that are listed as threatened or endangered under FESA and/or CESA or as rare by the California Fish and Game Commission. Non-listed special-status species refers to all other types of special-status species, as described above, that are not listed as threatened or endangered under FESA and/or CESA or as fully protected by the California Fish and Game Commission.

Sensitive natural community is a natural community that receives regulatory recognition from municipal, county, state, and/or federal entities, such as the CDFW in its California Natural Diversity Database (CNDDB), because the community is unique in its constituents, restricted in distribution, supported by distinctive soil conditions, and/or considered locally rare. (See Section 4.6.1.5 for a discussion of sensitive natural communities in the study area.)

Critical habitat is defined for listed species under FESA and consists of: (1) the specific areas within the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of FESA, on which are found those physical or biological features (constituent elements) that are essential to the conservation of the species and that may require special management considerations or protection; and (2) the specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of FESA, upon a determination by the Secretary that such areas are essential for the conservation of the species.

Waters of the U.S. is defined in the Code of Federal Regulations (33 CFR 328.3[a]; 40 CFR 230.3[s]) as:

(1) All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide;

(2) All interstate waters, including interstate wetlands;

[2] CNPS CRPR 1A is a plant that is presumed extinct in California. CRPR 1B is a plant that is rare, threatened, or endangered in California and elsewhere. CRPR 2A is presumed extirpated in California, CRPR 2B is a plant that is rare, threatened, or endangered in California but more common elsewhere. CRPR 3 is a plant about which more information is needed. CRPR 4 is a plant of limited distribution.

(3) All other waters, such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce, including any such waters that are or could be used by interstate or foreign travelers for recreational or other purposes; or from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or which are used or could be used for industrial purposes by industries in interstate commerce;

(4) All impoundments of waters otherwise defined as waters of the U.S. under the definition;

(5) The tributaries of waters identified in numbers (1) through (4), above;

(6) Territorial seas; and

(7) Wetlands located adjacent to waters (other than waters that are themselves wetlands) identified in numbers (1) through (6), above.

Federal "Other Waters" is a type of water of the U.S. It includes all waters of the U.S. described above, except for features that meet the federal definition of a wetland.

Waters of the state are defined differently by three state agencies: RWQCB, CDFW, and CCC. Waters of the state are more broadly defined than waters of the U.S. as any surface water or groundwater, including saline waters, within the boundaries of the state of California. Boundaries of waters of the state are often determined on a case-by-case interpretation of data by the state agencies. The definition of waters of the state for each state agency is described in Section 4.6.2.2, State Regulations.

Environmentally Sensitive Habitat Area (ESHA) is a designated protected area within the Coastal Zone as defined in the California Coastal Act. The detailed definition of ESHAs is provided in Section 4.6.1.5, Sensitive Natural Communities and Environmentally Sensitive Habitat Areas.

4.6.1.2 Information Sources and Survey Methodology

The descriptions of vegetation communities, wildlife habitats, and potentially jurisdictional waters in this section are based on reconnaissance-level field surveys,[3] focused and protocol level field surveys,[4] review of available biological resources survey reports encompassing portions of the study area, review of relevant literature, and review of databases and inventories maintained by resource agencies. The impact analysis described in this section is based on special-status species observations available to Environmental Science Associates (ESA) as of October 2017.

The study area was surveyed by ESA, Arcadis, and AECOM[5] between 2012 and 2016. ESA biologists conducted reconnaissance-level field surveys of previously proposed pipeline alignments and facility sites on May 17, June 5, and September 20, 2012 (ESA, 2012); March 6, 7, and 26,

[3] Reconnaissance-level field surveys are conducted for the purpose of generally describing the vegetation communities present within a project area and assessing the potential for special-status species to occur within the project area plus a 50-foot buffer (i.e., the survey area).

[4] Focused surveys are conducted to determine the presence or absence of a certain species or habitat type. Protocol-level surveys are a type of focused survey using specific survey protocol as defined by a regulatory agency.

[5] URS conducted the surveys in September 2013, March 2014, April 2014, and June 2014, but AECOM acquired URS in 2014.

2013, and May 9, 2013 (ESA, 2013); and April 24, 2014, and June 25, 2014 (ESA, 2014). Updated surveys for the majority of proposed pipeline alignments and facility components that are included as part of the proposed project analyzed in this EIR/EIS were conducted by ESA biologists on March 23, 24, and 25; April 7; and May 20, 21, and 22, 2016 (ESA, 2016). AECOM conducted focused and protocol-level surveys, including wetland delineation mapping, of the proposed pipeline and facility sites on September 3 through 5, 2013; March 17 through 21, April 21 through 25, May 20 through 22, and June 11 through 20, 2014; and March 17 and 18, April 7 through 9, June 10, June 15 through 18, 2015, and March 14 through 18, April 25 through 29, June 6 through 10, June 16, and June 17, 2016 (URS, 2014a, 2014b; AECOM, 2016). The area where water produced during development of the ASR-5 and ASR-6 Wells was not accessed because of unexploded ordnance restrictions, but the majority of the site was visually surveyed from General Jim Moore Boulevard.

During the 2016 surveys, ESA confirmed plant communities identified (inclusive of vegetation alliance) and wetland delineation mapping conducted by AECOM between 2013 and 2016 and by ESA between 2012 and 2015. ESA biologists also identified and mapped any new plant communities, habitat types, and potentially jurisdictional wetlands and drainages within the study area.

For this analysis, ESA biologists documented plant and wildlife species observed during reconnaissance-level, protocol-level, and focused surveys and evaluated the potential for sensitive natural communities, special-status plant and animal species, and wildlife movement corridors to occur within the study area.

Other key references used in the preparation of this section include, but are not limited to, aerial photographs, topographic maps, soil survey maps, geological maps, USFWS National Wetland Inventory (NWI) maps (USFWS, 2016b), climatic data, project plans, and the following:

- H. T. Harvey & Associates, 2005. *California American Water Company Monterey County Coastal Water Project Terrestrial Biological Resources Phase II Report*.
- Jones & Stokes, 2006. *Final Environmental Impact Report/Environmental Assessment for the Monterey Peninsula Water Management District Phase 1 Aquifer Storage and Recovery Project.* State Clearinghouse No. 2004121065. Prepared for the Monterey Peninsula Water Management District. Certified August 21, 2006.
- Fort Ord Reuse Authority, 2012. *Draft Installation-Wide Multispecies Habitat Conservation Plan*. Prepared by ICF International. March 2012.
- “Monterey Desal rare plant survey” email from Martha Lowe, Environmental Science Associates, to Erin Harwayne, Denise Duffy & Associates (ESA, 2010).
- Special-status plant surveys conducted on the CEMEX site on April 24, 2014 by ESA and Zander Associates (Zander Associates, 2014).
- Special-status plant and animal surveys, wetland delineation mapping, and vegetation mapping conducted in the study area between 2013 and 2016 (AECOM, 2016).
- AECOM, 2017. *Jurisdictional Delineation for California American Water Monterey Peninsula Water Supply Project*. April, 2017.

Other sources of information include: applicable literature on biological resources in the Monterey region; the Monterey County General Plan (Monterey County, 2010); the CNPS on-line Electronic Inventory (CNPS, 2016); the USFWS official list of species occurring in Monterey County (USFWS, 2016a); the CDFW's CNDDB special-status species records for the Moss Landing, Marina, Salinas, Seaside, Spreckels, Carmel Valley, Monterey, Mount Carmel, and Prunedale United States Geological Survey (USGS) 7.5-minute topographic quadrangles (CDFW, 2016); and Calflora (2016).

4.6.1.3 Regional Terrestrial Biological Resources

Monterey County is situated at the confluence of the San Francisco Bay, Central Coast, and South Coast Range floristic provinces. As a result, the flora of Monterey County is some of the most diverse in California. Monterey County represents the southern and northern population range limits of many rare species endemic to the northern and southern portions of the state, respectively.

The study area extends from Tembladero Slough to the Carmel River valley to the south. The proposed Castroville Pipeline traverses agricultural fields and a portion of the Salinas River. Some segments of the proposed pipeline alignments are located on stabilized back dune slopes on the west side of Highway 1, within incorporated areas generally bordering Highway 1 to the east. The proposed slant well site is located within the CEMEX active mining area in northern Marina. In the vicinity of the proposed ASR facilities and other proposed pipeline alignments, the former Fort Ord military base comprises extensive areas of relatively undisturbed maritime chaparral, a unique plant community associated with stabilized Pleistocene sand dunes. The proposed interconnection improvements for the Highway 68 satellite water systems are located within low-density residential and business areas in the forested hillsides above the Carmel River Valley.

Most of the study area is within 5 miles of the Pacific Ocean on level to gently sloped topography. With the exception of the proposed interconnection improvements along the Highway 68 corridor, which range between 400 and 800 feet in elevation, elevations within the other portions of the study area range from sea level to approximately 350 feet. Average annual precipitation in the city of Monterey is 20 inches; annual temperatures average 65 degrees Fahrenheit (NOAA, 2014).

4.6.1.4 Vegetation Communities and Habitat Types

The vegetation/habitat classification presented herein is based on *A Manual of California Vegetation* (Sawyer et al., 2009) and habitat mapping methods used in the *CalAm Coastal Water Project Final Environmental Impact Report* (CPUC, 2009). The majority of the study area was mapped in the field using vegetation alliances described in *A Manual of California Vegetation*. This mapping was conducted by AECOM between 2013 and 2015 in support of federal and state regulatory permit applications (AECOM, 2016). ESA verified this survey data in the field in 2016. For the purposes of this EIR/EIS, these vegetation alliances were combined into broader vegetation community types that correlate with wildlife habitat types. The description of the general vegetation types includes a listing of the finer-scale alliances that are either largely consistent with them or that are included within them. **Table 4.6-1** summarizes the broader vegetation types and their included alliances, and crosswalks these with wildlife habitats. This method supports consistency between this document, which focuses on the broader vegetation community types, and future regulatory permit applications, which may rely on vegetation alliance or wildlife habitat categories.

TABLE 4.6-1
VEGETATION COMMUNITY AND HABITAT TYPE CROSSWALK

Vegetation Community/ Habitat Type	Vegetation Alliance[a]	Wildlife Habitat[b]
Non-native Grassland	Annual brome grasslands California annual grassland	Annual Grassland
Central Dune Scrub	California buckwheat scrub California coffee berry scrub California sagebrush scrub Deerweed scrub Dune mat Island buckwheat scrub Sandmat manzanita chaparral Silver dune lupine-mock heather scrub	Coastal Scrub
Central Maritime Chaparral	Maritime chaparral Sandmat manzanita chaparral Silver dune lupine-mock heather scrub Deerweed scrub	Mixed Chaparral
Northern Coastal Scrub	California sagebrush scrub California sagebrush-California buckwheat Scrub California sagebrush-California black sage Scrub Coastal brambles Deerweed scrub Poison oak scrub Yellow bush lupine scrub	Coastal Scrub
Coyote Brush Scrub	Coyote Brush Scrub	Coastal Scrub
Riparian Woodland and Scrub	Arroyo willow thickets Box-elder forest Fremont cottonwood woodland Shining willow groves	Valley Foothill Riparian
Freshwater Marsh	California bulrush marsh Cattail marshes Soft rush marsh Knotweed marsh	Freshwater Emergent Wetland
Coast Live Oak Woodland	Coast Live Oak woodland	Coastal Oak Woodland
Open Water	None	Riverine
Ice Plant Mats	Ice Plant Mats	None
Agricultural	None	Cropland
Ruderal	Perennial pepperweed patches	None
Developed/Landscaped	Eucalyptus groves Acacia shrubland Monterey cypress stands Monterey pine woodland	Urban Barren Eucalyptus

NOTES:
[a] Per protocol-level and focused surveys conducted by AECOM, which used the classifications from *A Manual of California Vegetation* [Sawyer et al., 2009]
[b] Classifications from *A Guide to Wildlife Habitats of California* [Mayer and Laudenslayer, 1988]

Figures 4.6-1a through **4.6-1o** provide maps of vegetation alliances, listed within their respective vegetation community/habitat type as described below, within the study area. The figures are intended as a general guide; additional and more detailed information is included in the discussion below.

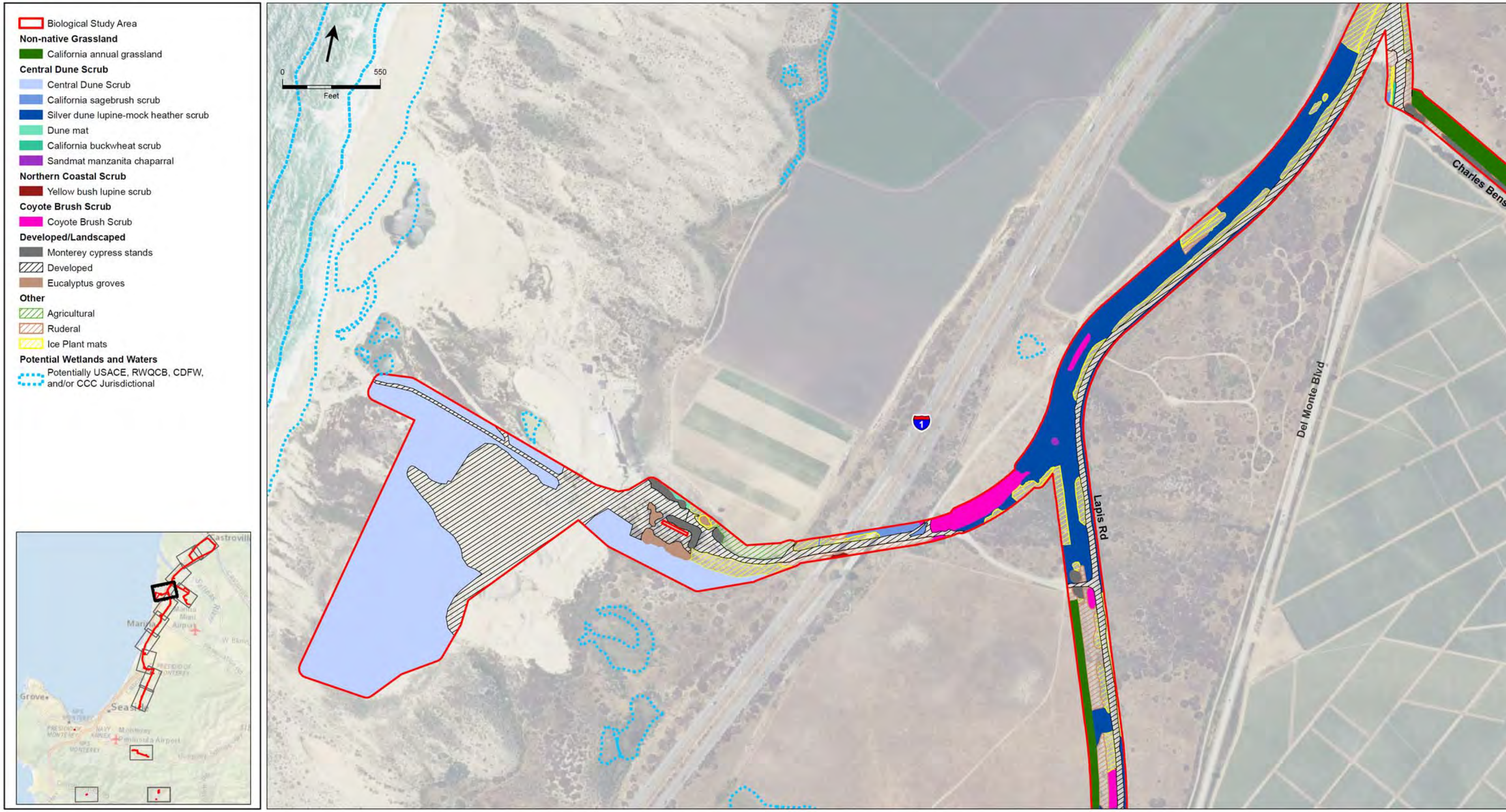
Vegetation communities and habitat types within the project area include: non-native grassland, central dune scrub, central maritime chaparral, northern coastal scrub, coyote brush scrub, riparian woodland and scrub, freshwater marsh, coast live oak woodland, open water (includes pond, channel, river), ice plant mats, agricultural, ruderal, and developed/landscaped.

Non-Native Grassland

Non-native grassland occurs at various locations throughout the study area. It occurs as monotypic stands and also interspersed with several other vegetation communities, such as oak woodland, central maritime chaparral, central dune scrub, ice plant mats, and ruderal areas. It can support dominant plant species of other communities, and can provide habitat for special-status species that occur in these adjacent habitats. The largest expanses of non-native grassland within the project area occur north of the intersection of Del Monte Boulevard and Highway 1 in Marina, along the Monterey Peninsula Recreational Trail in the vicinity of Reservation Road, north of the intersection of Highway 1 and Nashua Road, and at and adjacent to the existing Monterey Regional Water Pollution Control Agency (MRWPCA) Regional Wastewater Treatment Plant, including the proposed Desalination Plant site and other lands north of Charles Benson Road. Within the study area this community comprises a variety of non-native annual grasses, introduced weedy forbs, and a few native grasses and forbs. Common dominants of non-native grassland in the study area include Italian ryegrass (*Festuca perennis*), ripgut brome (*Bromus diandrus*), annual fescue (*Festuca myuros*), hare barley (*Hordeum murinum* ssp. *leporinum*), and wild oat (*Avena fatua*). Associated forbs include filaree (*Erodium botrys*), English plantain (*Plantago lanceolata*), wild radish (*Raphanus sativus*), shortpod mustard (*Hirschfeldia incana*), prickly sow thistle (*Sonchus asper*), deerweed (*Acmispon glaber*), and iceplant (*Carpobrotus edulis, C. chilensis*). Occasional native grasses such as purple needlegrass (*Stipa pulchra*) and creeping wildrye (*Elymus triticoides*) also occur. Some shrubs and trees, including the native coyote brush (*Baccharis pilularis*), mock heather (*Ericameria ericoides*), Monterey cypress (*Hesperocyparis macrocarpa*), and non-native eucalyptus (*Eucalyptus globulus*, and others), also are found sporadically within the grasslands. In general, the diversity of plant species within non-native grassland varies greatly with levels of disturbance. Coastal prairie, a rare and sensitive plant community of relatively undisturbed sites and characterized by a high proportion of native perennial grasses, and a diversity of native forbs and several special-status species, was not observed within the study area.

Non-native grassland includes the following vegetation alliances as mapped by AECOM (2016):

- Annual brome grasslands (*Bromus* [*diandrus, hordeaceus*] - *Brachypodium distachyon* Herbaceous Semi-Natural Alliance)
- California annual grassland

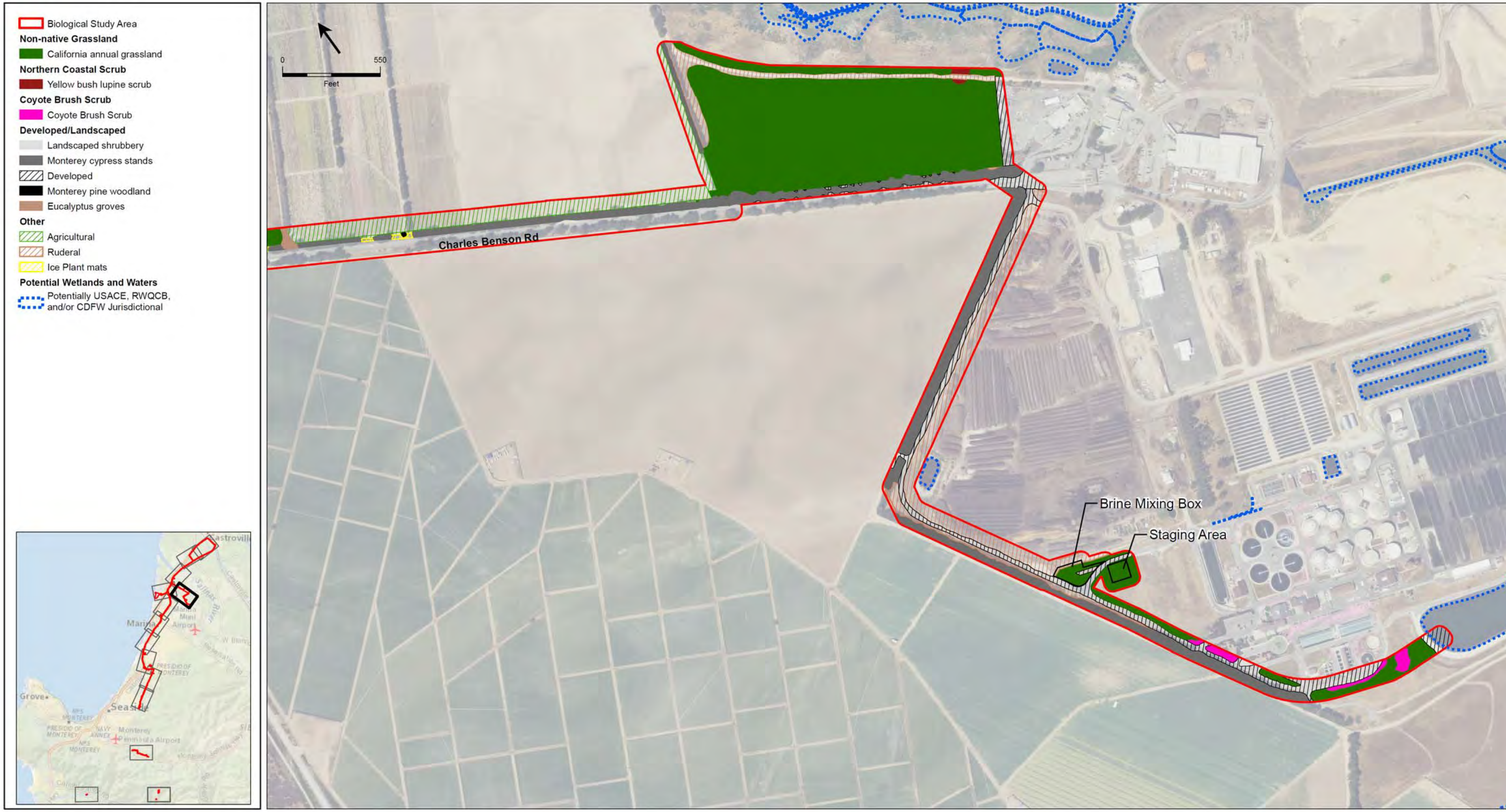


SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1a

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area



SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1b

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

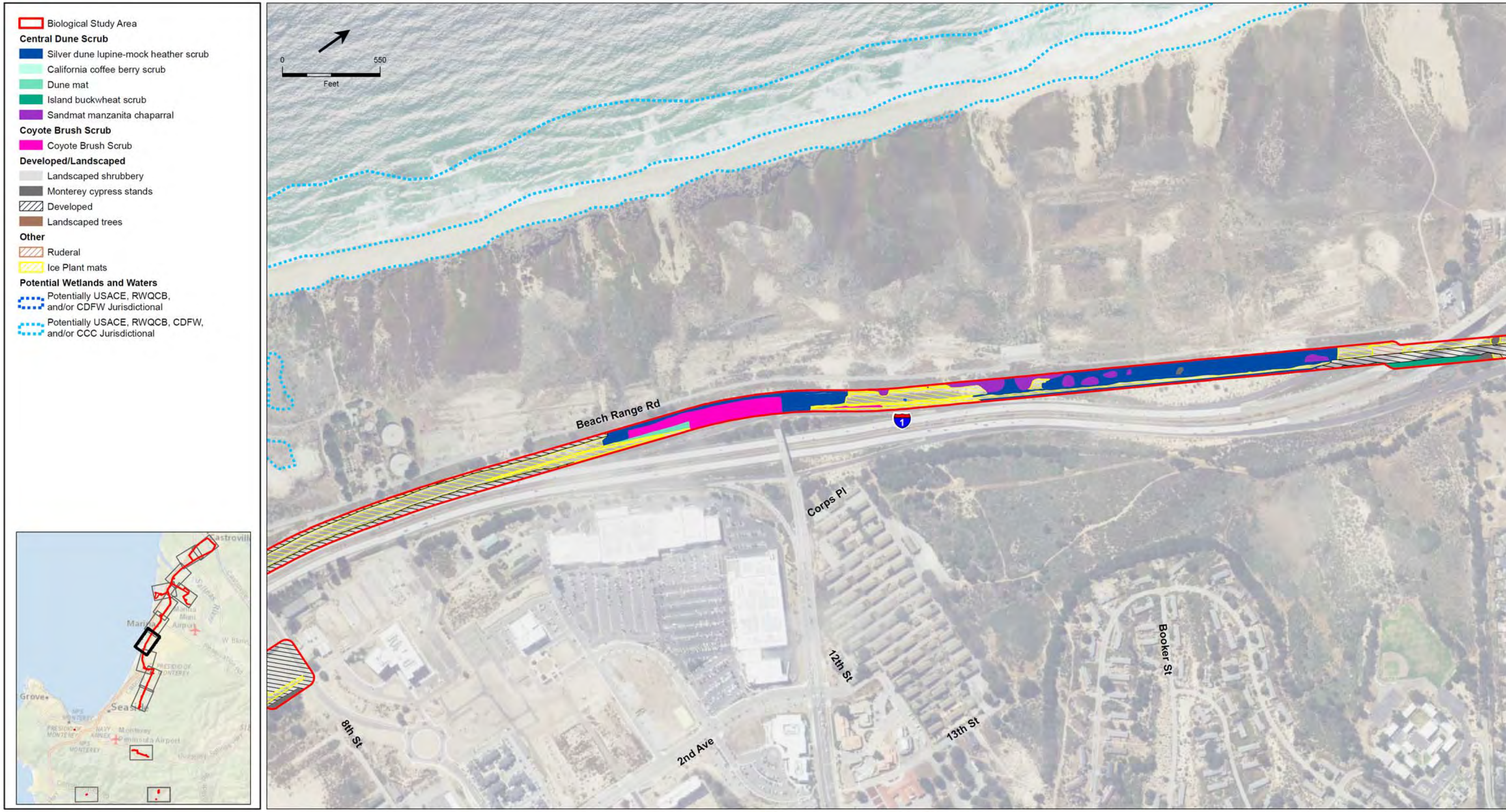
Figure 4.6-1c
Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1d

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

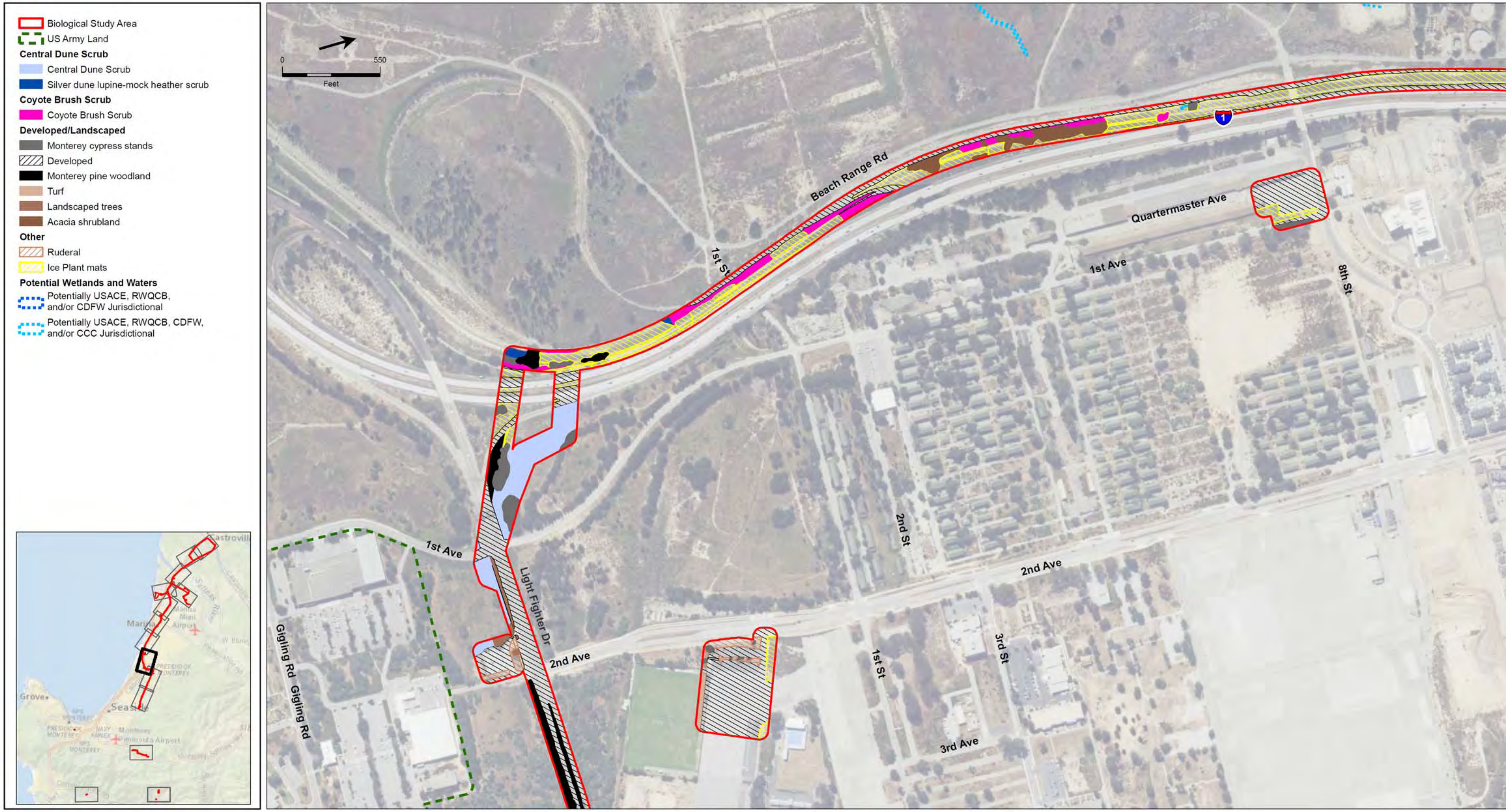


SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1e

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

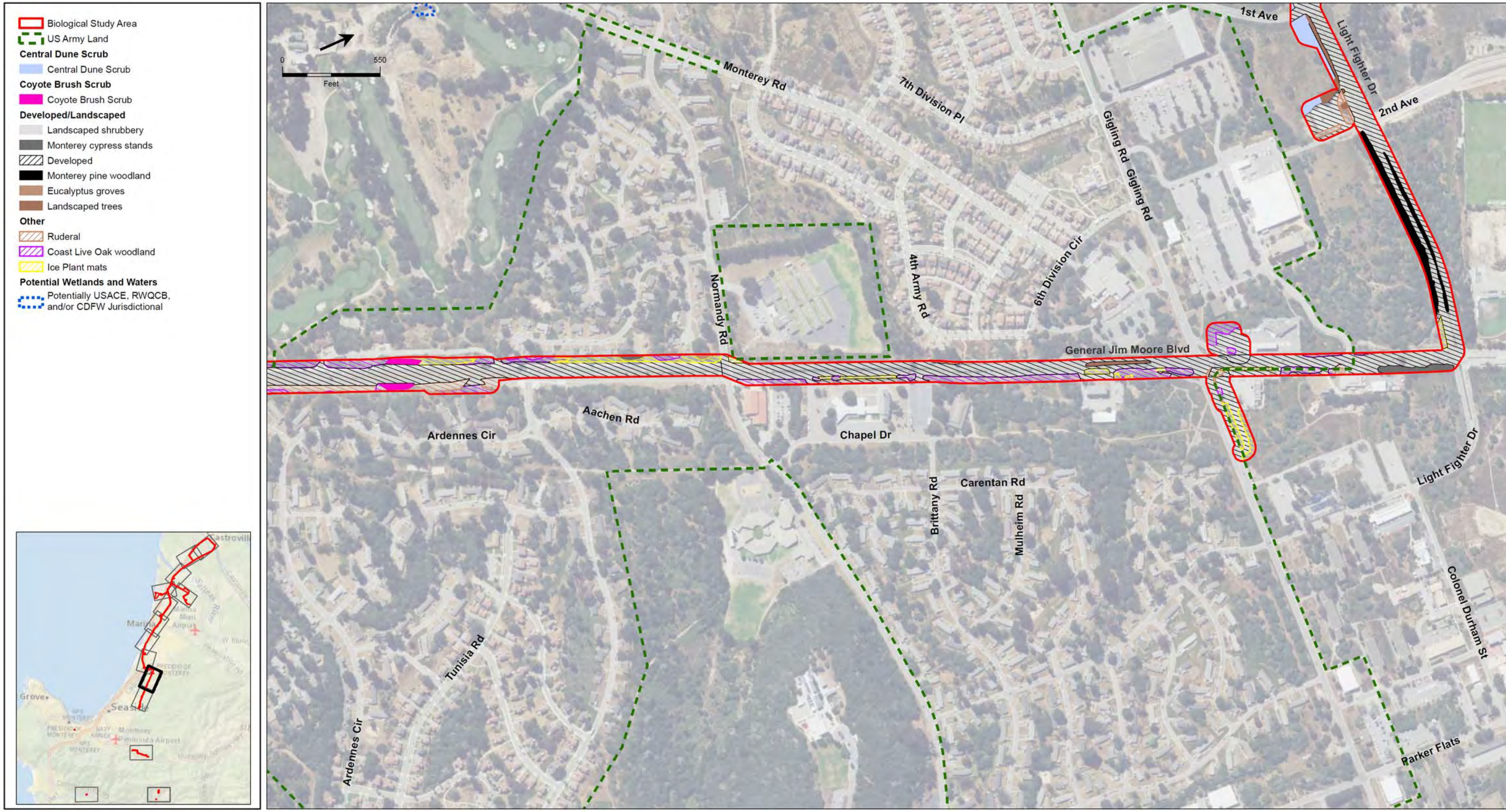


SOURCE: ESA, 2016,AECOM, 2016; US ARMY, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1f

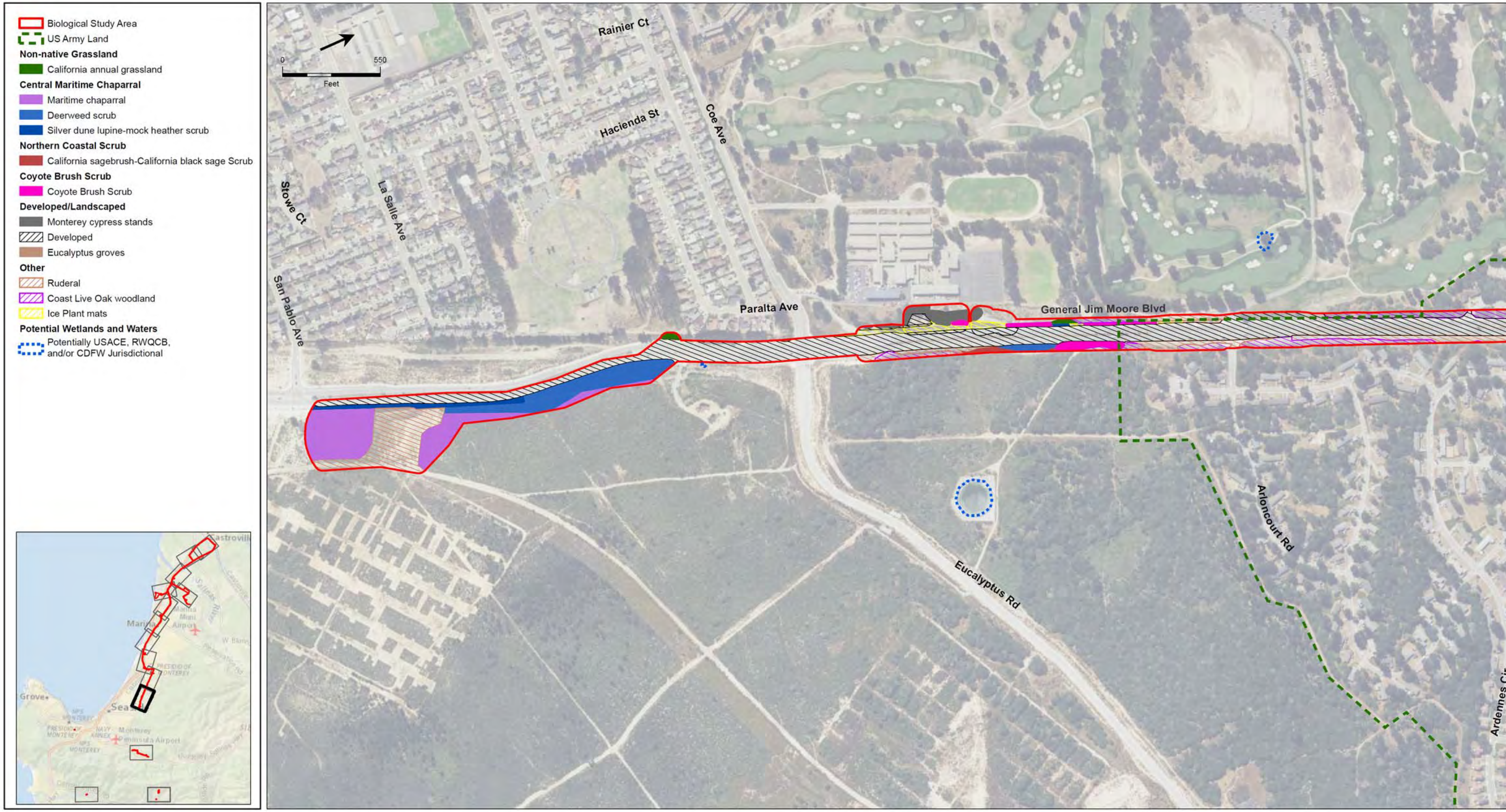
Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area



SOURCE: ESA, 2016,AECOM, 2016; US ARMY, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1g
Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

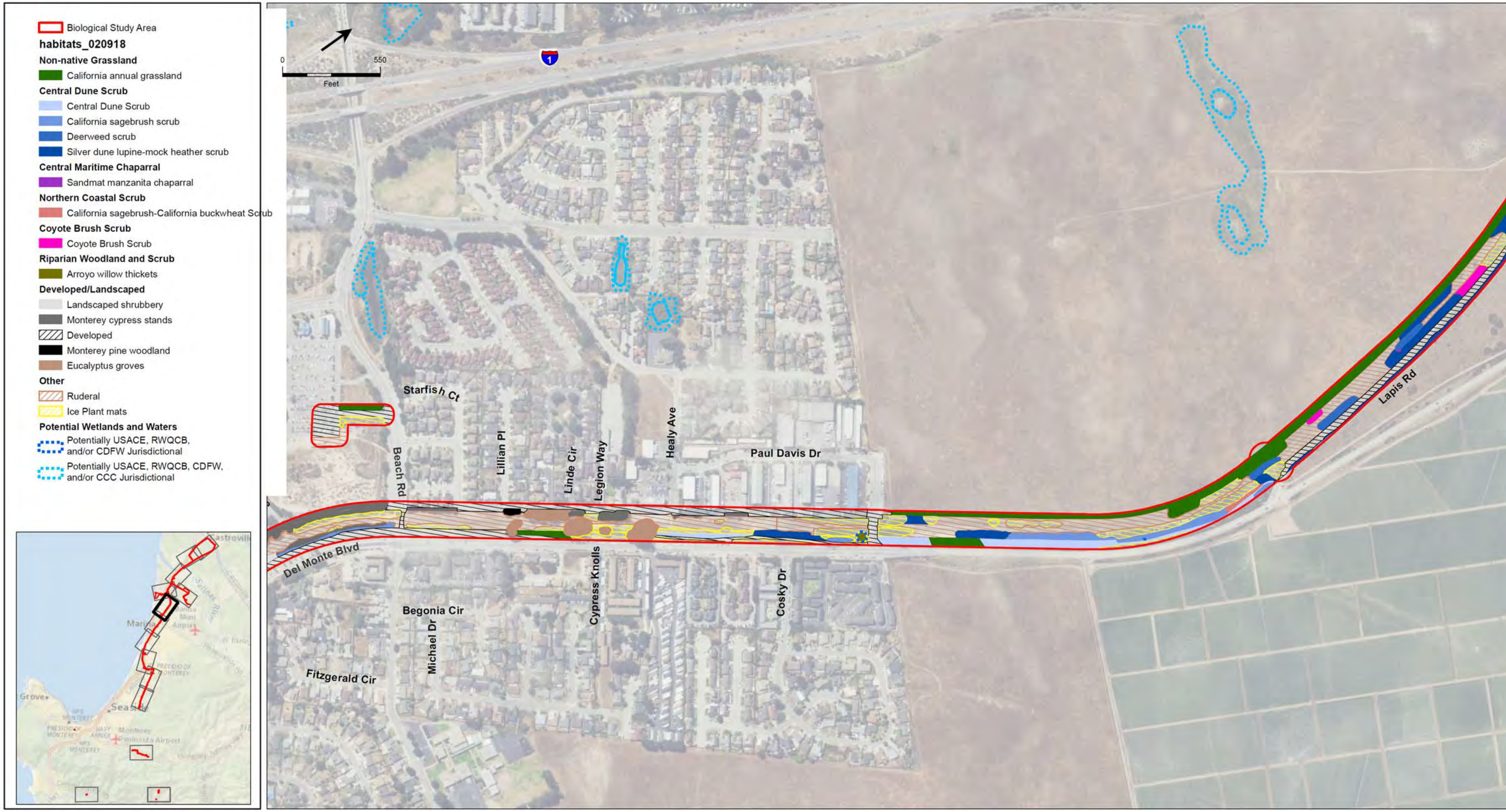


SOURCE: ESA, 2016,AECOM, 2016; US ARMY, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1h

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area



SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

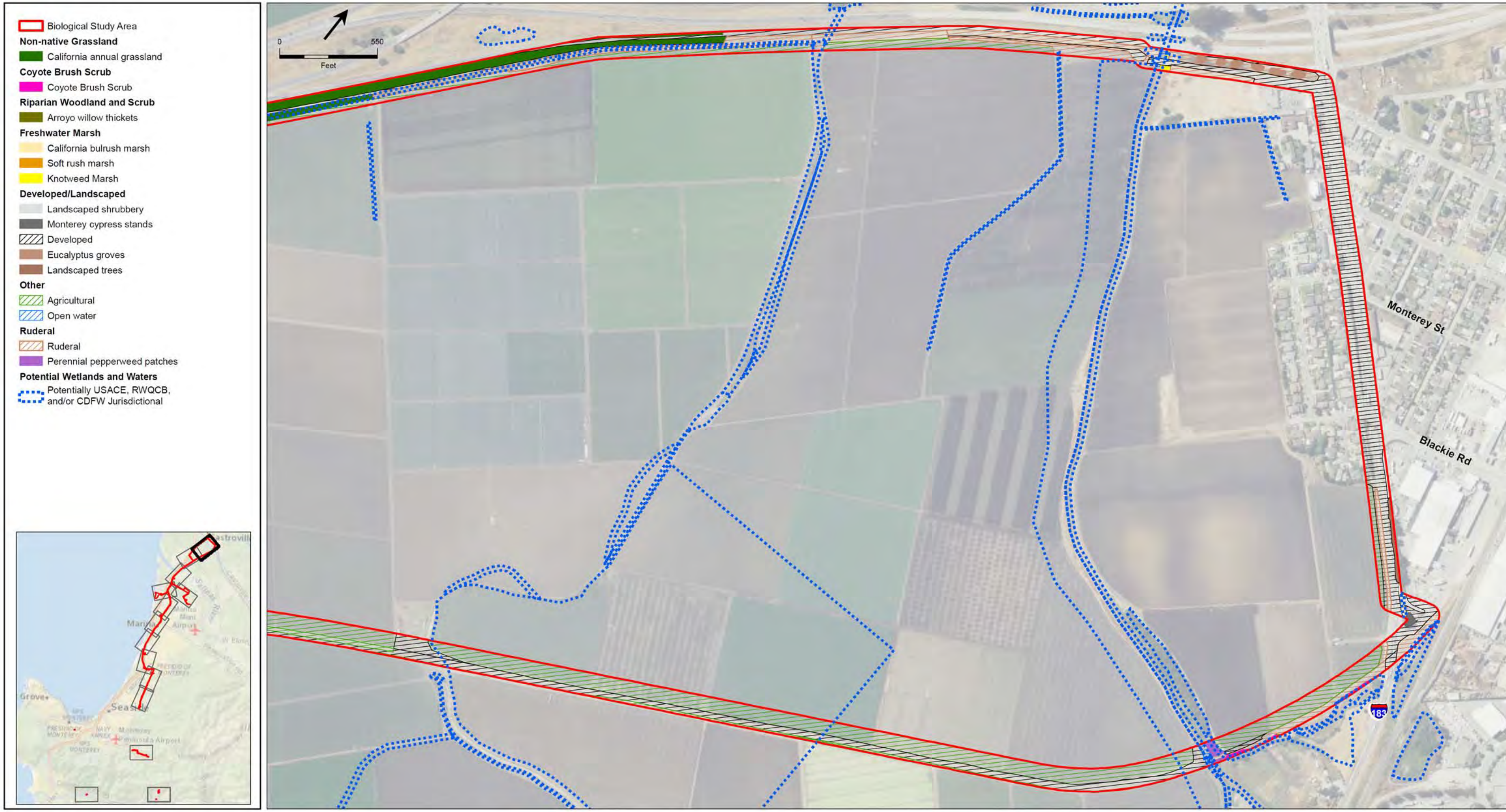
Figure 4.6-1j
Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1k

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

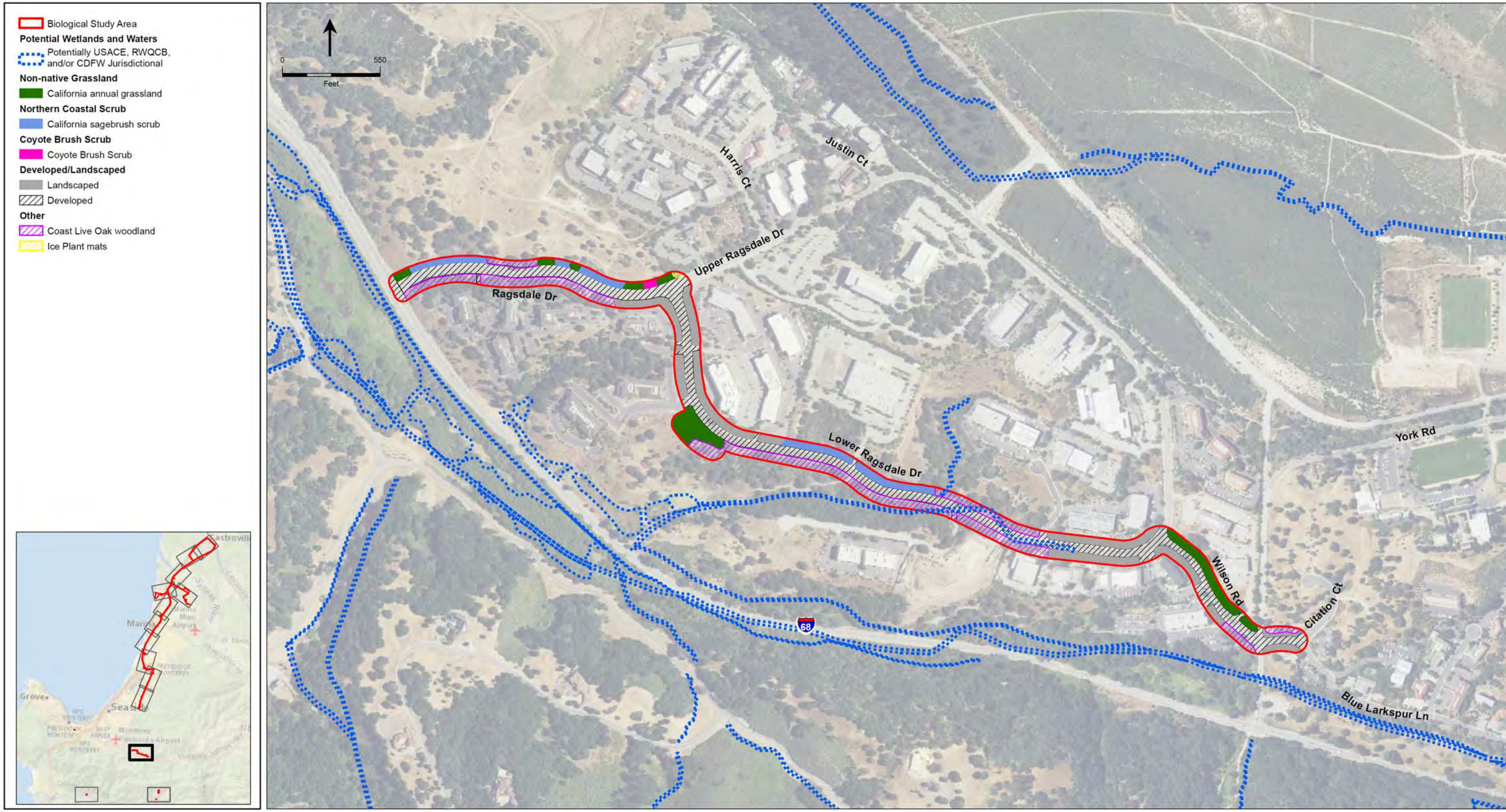


SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1I

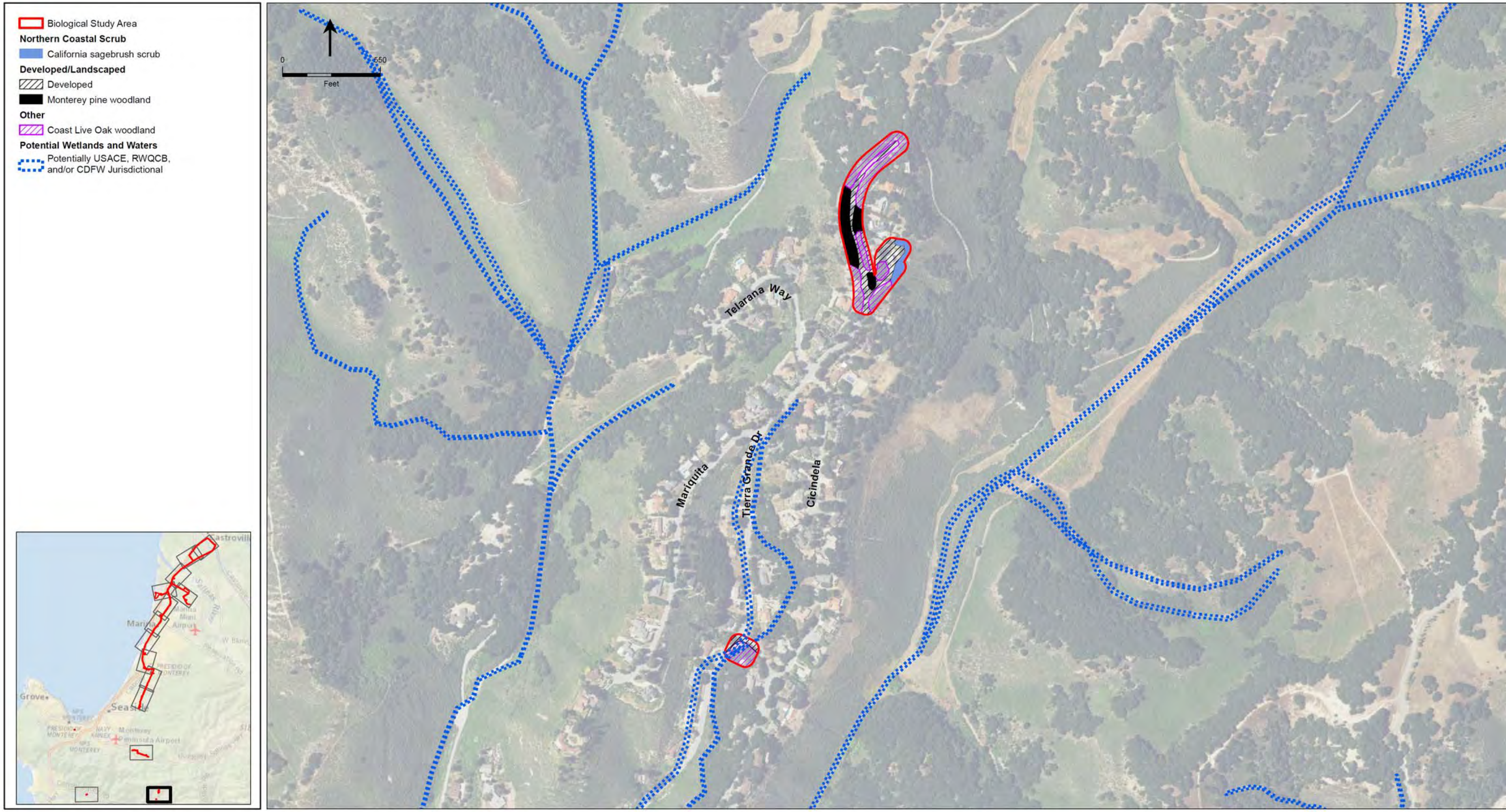
Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area



SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

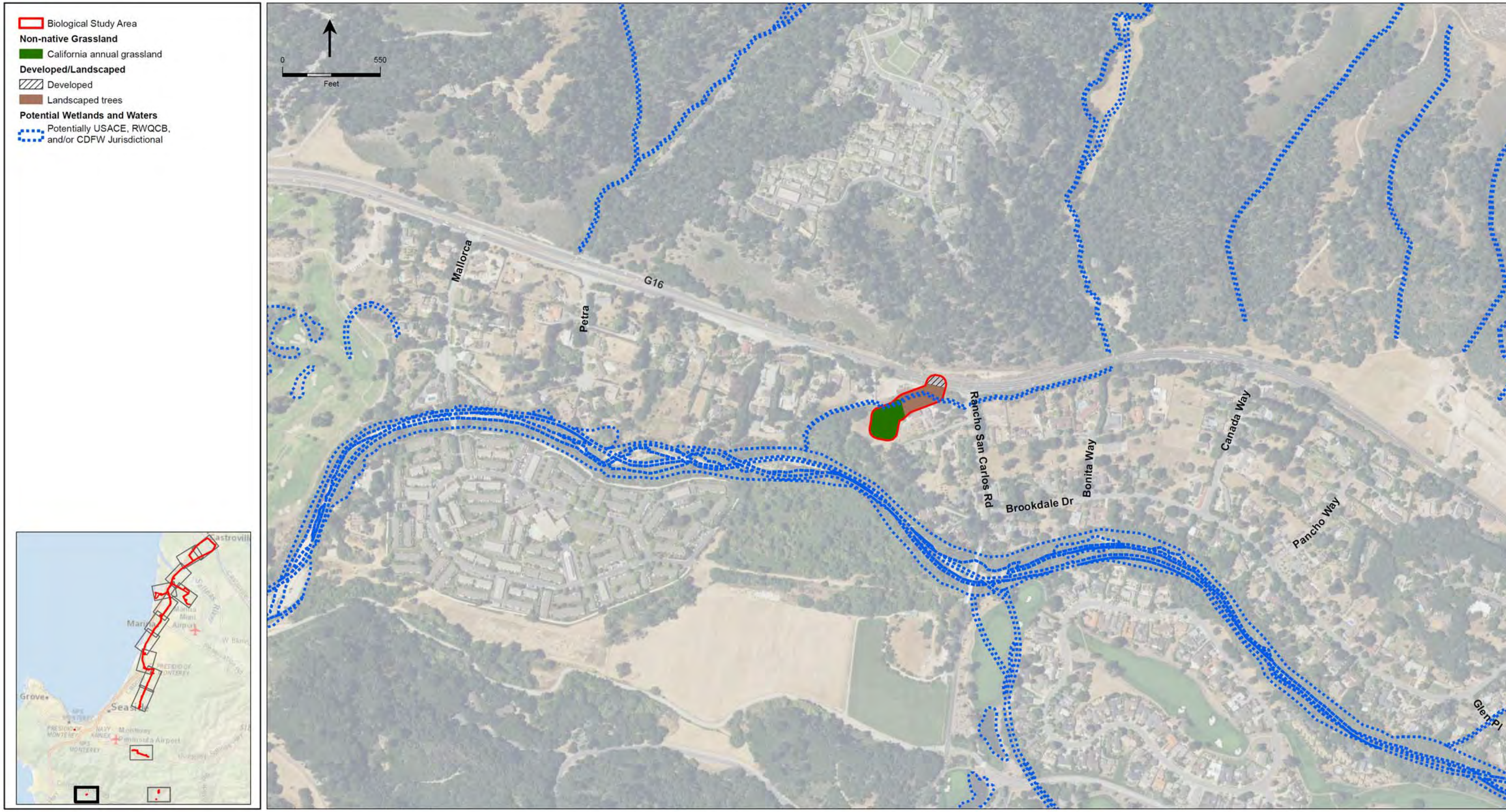
Figure 4.6-1m
Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area



SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1n
Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area



SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1o

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

Annual grassland provides little cover for wildlife, yet numerous species forage, and several species breed, in this community. Small mammals such as deer mice (*Peromyscus maniculatus*), California ground squirrels (*Spermophilus beecheyi*), and Botta's pocket gophers (*Thomomys bottae*) are common residents in annual grasslands in Monterey County. Larger mammals such as coyotes (*Canis latrans*) and bobcats (*Lynx rufus*) occasionally forage in this community as well.

A variety of birds use annual grasslands as foraging habitat, including savannah sparrows (*Passerculus sandwichensis*), horned larks (*Eremophila alpestris*), western meadowlarks *(Sturnella neglecta*), lesser goldfinches *(Carduelis psaltria*), and barn swallows (*Hirundo rustica*). Western meadowlarks, horned larks, and mourning doves (*Zenaida macroura*) may nest in grasslands in the project area. Raptors, such as red-tailed hawks (*Buteo jamaicensis*) and northern harriers *(Circus cyaneus*), commonly forage over grasslands as well. Some species of raptors, such as red-tailed hawks and white-tailed kites (*Elanus leucurus*), may occasionally nest in trees within the grassland. Western fence lizards *(Sceloporus occidentalis*), gopher snakes (*Pituophis catenifer catenifer*), and other snakes are also likely to occur in this community in the project area.

Central Dune Scrub

Central dune scrub occurs extensively throughout most of the study area. This vegetation type generally exhibits some level of disturbance from past or present land use, dune instability, or invasive plant species, but the level of disturbance varies throughout the study area.

Central dune scrub occurs in the northern portion of the study area along Lapis Road and Del Monte Boulevard, along the Monterey Peninsula Recreational Trail between Marina and Seaside, in the dunes along the western boundary of the CEMEX active mining area (i.e., the vegetated patches between the active mining area and the beach), in undisturbed sections of the CEMEX active mining area, and along the CEMEX access road. These areas contain native dune scrub species, but also support a variety of non-native and invasive species and often include a substantial proportion of non-native and highly invasive ice plant. Typical native shrubs found throughout the disturbed dune scrub habitat include California sagebrush (*Artemisia californica*), coast buckwheat (*Eriogonum latifolium*), deerweed, California lilac (*Ceanothus* spp.), mock heather (*Ericameria ericoides*), silver dune lupine (*Lupinus chamissonis*), and sandmat manzanita (*Arctostaphylos pumila*). Non-native cover typically includes non-native grasses (wild oat, Mediterranean barley, and Italian ryegrass), iceplant, and other weedy species. Some typical foredune species, such as beach evening primrose (*Camissonia cheiranthifolia*) and sea rocket (*Cakile maritima*), occur along the CEMEX access road where the central dune scrub transitions to the beach.

The composition of dune scrub vegetation transitions throughout the study area from areas dominated by non-native species (within residential neighborhoods in Marina and between Imjin Parkway and Lightfighter Drive in Sand City) to areas with higher native cover in the dunes between the CEMEX active mining area and along the CEMEX access road, Lapis Road, Del Monte Boulevard north of Beach Road, and the Monterey Peninsula Recreational Trail between Imjin Parkway and approximately Reindollar Avenue.

The following vegetation alliances mapped by AECOM (2016) are included in the broad concept of Central dune scrub described above:

- California buckwheat scrub (*Eriogonum fasciculatum* Shrubland Alliance)
- California coffee berry scrub (*Frangula californica* Shrubland Alliance)
- California sagebrush scrub (*Artemisia californica* Shrubland Alliance)
- Deerweed scrub (*Lotus scoparius* Shrubland Alliance)
- Dune mat (*Abronia latifolia - Ambrosia chamissonis* Herbaceous Alliance)
- Island buckwheat scrub (*Eriogonum giganteum* Landscaped Scrub)
- Sandmat manzanita chaparral (*Arctostaphylos pumila* Provisional Shrubland Alliance)
- Silver dune lupine-mock heather scrub (*Lupinus chamissonis - Ericameria ericoides* Shrubland Alliance)

Within the study area, central dune scrub is likely to support several reptile species, including southern alligator lizards (*Elgaria multicarinata*), western fence lizards, and black legless lizards (*Anniella pulchra nigra*). Small mammals such as deer mice and brush rabbits (*Sylvilagus bachmani*) provide prey for nonnative red foxes (*Vulpes regalis*) that occur in this habitat. White-crowned sparrows (*Zonotrichia leucophrys*) are probably the most abundant breeding bird in this habitat. Horned larks and song sparrows (*Melospiza melodia*) are among other birds found in this habitat. Where its host plant (coast buckwheat) is present, Smith's blue butterfly (*Euphilotes enoptes smithi*) also may occur in central dune scrub.

Central Maritime Chaparral

Central maritime chaparral is a plant community limited to areas of sandy soils subject to summer fog. It is found in relatively small patches throughout its range along the central coast. It is dominated by endemic species of manzanita (*Arctostaphylos* spp.), California lilac (*Ceanothus* spp.), and chamise (*Adenostoma fasciculata*), and supports a high proportion of other rare and endangered plants and wildlife. The former Fort Ord military base encompasses some of the largest, most intact areas of maritime chaparral remaining on the central coast. Maritime chaparral in the study area is closely associated with relict sand dunes (i.e., paleodunes) of the mid-Pleistocene era, a geomorphic feature of very limited distribution within California that has been much reduced by urban development in the communities of Marina and Seaside. In addition, the overall viability of maritime chaparral is likely declining due to long-term suppression of fire and other natural disturbances, which help maintain the health and diversity of this plant community. Studies show that long-term absence of fire within central maritime chaparral may lead to the community's transition to oak woodland (Van Dyke et al., 2001). Many annual and herbaceous perennial species depend on fire and other disturbance to control encroachment of woody species.

Within the study area, central maritime scrub occurs along the east side of General Jim Moore Boulevard and south of Coe Avenue in the former Fort Ord military base; specifically, at the southern terminus of the construction area for the ASR facilities where water produced during development of the ASR wells would be conveyed and percolated. Within the study area, this community exists as a mosaic of disturbed and undisturbed variations, with most of the disturbed areas located near General Jim Moore Boulevard and adjacent to existing access roads within the former Fort Ord military base. These areas were likely disturbed during road construction and military operations, and typically support deerweed scrub as an early successional response to the disturbance. The non-disturbed areas are dominated by shaggy-barked or woolly-leaf manzanita (*Arctostaphylos tomentosa* ssp. *tomentosa*), sandmat manzanita, sticky monkeyflower (*Mimulus aurantiacus*), chamise, black sage (*Salvia mellifera*), and poison oak (*Toxicodendron diversilobum*) with many other perennials and shrubs common throughout. The disturbed areas contain many of the same species but have higher cover of deerweed, iceplant, bush lupine (*Lupinus* spp.), and non-native grasses. Additionally, these disturbed areas contain higher cover of unvegetated sandy soil. A variety of special-status plants have been documented within the former Fort Ord military base including sandmat manzanita, Monterey spineflower, seaside bird's-beak (*Cordylanthus rigidus* ssp. *littoralis*), Eastwood's goldenbush (*Ericameria fasciculata*), Kellogg's horkelia (*Horkelia cuneata* ssp. *sericea*), and sand gilia (*Gilia tenuiflora* ssp. *arenaria*) (Fort Ord Reuse Authority, 2012).

Central maritime chaparral includes the following vegetation alliances as mapped by AECOM (2016):

- Sandmat manzanita chaparral (*Arctostaphylos pumila* Provisional Shrubland Alliance)
- Silver dune lupine-mock heather scrub (*Lupinus chamissonis* - *Ericameria ericoides* Shrubland Alliance)
- Deerweed Scrub (*Lotus scoparius* [=*Acmispon glaber*] Shrubland Alliance) – occurs as early seral stage in disturbed areas of former maritime chaparral.

Wildlife species likely to occur in maritime chaparral habitats include a variety of small reptiles, such as western fence lizards, alligator lizards, California horned lizards (*Phrynosoma blainvillii*), and California striped racers (*Coluber lateralis lateralis*), as well as a variety of small mammals, including deer mice, brush mice, and jackrabbits (*Lepus californicus*). Birds likely to occur here include California thrashers (*Toxostoma redivivum*), Western scrub-jays (*Aphelocoma californica*), wrentits (*Chamaea fasciata*), and Anna's hummingbirds (*Calypte anna*).

Northern Coastal Scrub

Northern coastal scrub occurs widely throughout the study area near the coast on sandy to clay soils, but typically more interior, developed, and stabilized soils than nearby active dunes. Within the study area, it occurs adjacent to the Salinas River, along General Jim Moore Boulevard within the some of the former Fort Ord lands, along Ragsdale and Lower Ragsdale Drive, and off of Tierra Grande Drive. Northern coastal scrub is associated with and transitions to grassland, maritime chaparral, coast live oak woodland, central dune scrub, and ice plant mats. The vegetation is characterized by sparse to dense cover of soft-leaved, low-stature shrubs such as coyote brush, California sagebrush, and black sage. Northern coastal scrub often supports a well-developed annual herbaceous understory that includes native wildflowers, non-native grasses (wild oat, Mediterranean barley, and Italian ryegrass), iceplant, and other weedy species. Several special-status plants are documented from this plant community, including Monterey spineflower, Monterey ceanothus, and sandmat manzanita. Many different alliances of northern coastal scrub are recognized based on dominant species.

Northern coastal scrub includes the following vegetation alliances as mapped by AECOM (2016):

- California sagebrush scrub (*Artemisia californica* Shrubland Alliance)
- California sagebrush-California buckwheat Scrub (*Artemisia californica - Eriogonum fasciculatum* Shrubland Alliance)
- California sagebrush-California black sage Scrub (*Artemisia californica - Salvia mellifera* Shrubland Alliance)
- Coastal brambles (Rubus [*parviflorus, spectabilis, ursinus*] Shrubland Alliance)
- Deerweed scrub (*Lotus scoparius* [=*Acmispon glaber*] Shrubland Alliance)
- Poison oak scrub (*Toxicodendron diversilobum* Shrubland Alliance)
- Yellow bush lupine scrub (*Lupinus arboreus* Shrubland Alliance and Semi-Natural Alliance)

Wildlife using this habitat are similar to those species expected in the maritime chaparral, such as California quail, blue-gray gnatcatcher (*Polioptila caerulea*), Anna's hummingbird, Coast Range fence lizard, northern pacific rattlesnake, gopher snake, brush rabbit, and California ground squirrel.

Coyote Brush Scrub

Coyote brush scrub occurs extensively throughout the study area. It ranges from small patches to extensive stands where it is associated with non-native grassland species in the spaces between shrubs. The most extensive stands are located north of the Salinas River, along Monte Road north of Del Monte Boulevard, along the railroad tracks between Lapis Road and the CEMEX access road in Marina, and at various locations along the Monterey Peninsula Recreational Trail between 8th Street and Lightfighter Drive. It is usually situated adjacent to or integrated with grasslands, coastal scrub and ruderal areas (such as roadsides and railroad rights of way). Often it is indicative of previous disturbance that has subsequently been left undisturbed for more than several years, allowing coyote brush to invade and establish in large numbers. Alternatively, it may displace coastal grasslands where fire or grazing have been eliminated, eventually converting them to mosaics of scrub and grassland. Special status plant species are uncommon, but may include species also found in grasslands or northern coastal scrub.

Coyote brush scrub conforms to the following vegetation alliance as mapped by AECOM (2016):

- Coyote brush scrub (*Baccharis pilularis* Shrubland Alliance)

Wildlife occurring in coyote brush scrub is expected to be similar to northern coastal scrub and non-native grassland.

Riparian Woodland and Scrub

Riparian woodland and scrub is often associated with perennial water sources such as lakes and rivers. Within the study area riparian woodland and scrub generally occurs along the edges of the pond at Locke-Paddon Park in Marina and along Laguna del Rey in Seaside, at the Salinas River crossing, and in a roadside drainage crossing of Castroville Road/Highway 183. Willows (*Salix* spp.) are typically the dominant trees and shrubs at these locations. Numerous shrubs, herbs, and vines also occur in the understory of this community, including mulefat (*Baccharis salicifolia*) and native and non-native blackberries (*Rubus ursinus*, *R. armeniacus*).

Riparian woodland and scrub includes the following vegetation alliances as mapped by AECOM (2016):

- Arroyo willow thickets (*Salix lasiolepis* Shrubland Alliance)
- Box-elder forest (*Acer negundo* Forest Alliance)
- Fremont cottonwood woodland (*Populus fremontii* Forest Alliance)
- Shining willow groves (*Salix lucida* Woodland Alliance)

Riparian woodland and scrub habitats provide cover and resources for a variety of wintering and breeding birds, such as yellow-rumped warblers (*Dendroica coronata*), warbling vireos (*Vireo gilvus*), orange-crowned warblers (*Oreothlypis celata*), and Wilson's warblers (*Cardellina pusilla*). The mixed understory in this community supports a variety of small mammals and reptiles, including raccoon (*Procyon loto*r), deer mice, and coast garter snake (*Thamnophis elegans terrestris*). Several riparian sites are located in incorporated areas in park settings and are subject to disturbance from vehicle and pedestrian traffic. In contrast, the Salinas River crossing location is relatively remote and continuous along the riverbanks, and consists of trees with a dense and multi-layered canopy that provides high quality habitat.

Freshwater Marsh

Freshwater marshes are wetland plant communities with year-round or nearly year-round inundation or soil saturation that supports perennial emergent plants, typically dominated by bulrushes, rushes and cattails. Within the study area, freshwater marshes are located in small impoundments and drainages along the proposed Castroville Pipeline, along Tembladero Slough within the proposed Castroville Pipeline Optional Alignment 1, and along a pond near the intersection of Aquajito Road and Fremont Street in Monterey. Freshwater marsh also may occur as small or sparse understory patches within areas mapped as other more dominant vegetation types, such as riparian forest and scrub.

Freshwater marsh includes the following vegetation alliances as mapped by AECOM (2016):

- California bulrush marsh (*Schoenoplectus californicus* Herbaceous Alliance)
- Cattail marshes (*Typha* [*angustifolia, domingensis, latifolia*] Herbaceous Alliance)
- Knotweed marsh
- Soft rush marshes ((*Juncus effusus* Herbaceous Alliance)

Freshwater marshes are used by common wildlife species including waterfowl such as Canada goose, mallard, American coot, pied-billed grebe, and great egret (*Ardea alba*). Marsh wren (*Cistothorus palustris*) and song sparrow (*Melospiza melodia*) may nest in shoreline vegetation of project area freshwater marsh habitat with northern rough-winged swallow (*Stelgidopteryx serripennis*) foraging over the open water. This habitat may also be used by amphibians including the sierra treefrog (*Pseudacris sierra*) and American bullfrog (*Lithobates catesbeianus*).

Coast Live Oak Woodland

Within the study area, coast live oak woodland is located along General Jim Moore Boulevard between Ardennes Circle and Coe Avenue, and adjacent to the Salinas River. Coast live oak woodland also occurs within the study area of the proposed Ryan Ranch–Bishop and Main System–Hidden Hills Interconnection Improvements. In the vicinity of the project area, coast live oak woodland occurs in sandy soils and is dominated by coast live oak (*Quercus agrifolia*) with the occasional eucalyptus, Monterey pine (*Pinus radiata*), or Monterey cypress. The understory is typically non-native grassland or other herbaceous annuals such as miner's lettuce (*Claytonia perfoliata*) and hedgenettle (*Stachys bullata*). In the vicinity of General Jim Moore Boulevard, coast live oak woodland forms a mosaic with central maritime chaparral and coastal sage scrub communities, and shrub species typically found in these two communities also occur in the adjacent oak woodland.

Coast live oak woodland conforms to the following vegetation alliance as mapped by AECOM (2016):

- Coast live oak woodland (*Quercus agrifolia* Woodland Alliance)

In Monterey County, coast live oak woodlands support a considerable diversity of wildlife species. Mammals likely to be found here include western gray squirrels (*Sciurus griseus*) and Monterey dusky-footed woodrats (*Neotoma fuscipes luciana*) as well as other small rodents. Mule deer (*Odocoileus hemionus*) also occur in oak woodlands. Several avian species rely heavily on the acorns for food, including acorn woodpeckers (*Melanerpes formicivorous*), western scrub-jays, and California quails (*Callipepla californica*). Chestnut-backed chickadees (*Poecile rufescens*), oak titmice (*Baeolophus inornatus*), Hutton's vireos (*Vireo huttoni*), dark-eyed juncos (*Junco hyemalis*), ash-throated flycatchers (*Myiarchus cinerascens*), and Nuttall's woodpeckers (*Picoides nuttallii*) are among other birds that nest in this community. Several species of amphibians, such as arboreal salamanders (*Aneides lugubris*), can be found in coast live oak woodlands, in which moisture is retained under fallen wood and in crevices in the oaks. Reptiles may include ringneck snakes (*Diadophis punctatu*s) and Skilton's skinks (*Plestiodon skiltonianus skiltonianus*).

Ice Plant Mats

Ice plant mats are relatively monotypic patches dominated by the nonnative ice plant species (*Carpobrotus edulis, C. chilensis*; landscaped areas of cultivated ice plant, *Drosanthemum floribundum,* are mapped as "landscaped"). Ice plant mats are low-growing, dense or patchy, and spread by runners. The dense growth habitat precludes other species, though many coastal dune scrub and annual grassland species may occur in gaps in ice plant cover. Ice plants are aggressive invaders of coastal dune and scrub habitats. They are also used in low-maintenance garden landscaping, on roadsides and medians, and in parking lots and sidewalk verges. Ice plants were widely introduced in the region to stabilize sand dunes, and have colonized a significant portion of the coastal dune and paleodune plant communities. Ice plant mats also are a frequent target for removal and restoration of native coastal vegetation.

Ice plant mats conform to the following vegetation alliance as mapped by AECOM (2016):

- Ice plant mats (*Carpobrotus edulis* or Other Ice Plants Herbaceous Semi-Natural Alliance)

Ice plant mats are regarded as providing marginal wildlife habitat value, though may provide cover for some small rodents and reptiles. Seeds of iceplant are eaten by deer, jackrabbits, and brush rabbits, which may contribute to the spread of ice plant (D'Antonio, 1990).

Agricultural

Agricultural lands exist in the northern study area along Charles Benson Road, Lapis Road, Del Monte Boulevard, Monte Road, Nashua Road, Highway 1, Highway 156, and the dirt agricultural road located north of Monte Road/Nashua Road. These lands provide little or no habitat for native plants and wildlife as they are regularly manipulated as crops are planted, harvested, rotated, and irrigated, or the lands are grazed. Other than crops (e.g., strawberries and cut flowers), vegetation in these areas consists primarily of non-native species adapted to disturbance, such as wild oat, bromes, mustards (*Brassica nigra* and *Hirschfeldia incana*), mallows (*Malva* spp.), and filarees.

Agricultural areas can support wildlife species that have adapted to disturbance, but generally support few wildlife species because of their lack of diversity in vegetation and foraging opportunities. California ground squirrels often occur along margins of cropland, and raptors such as red-tailed hawks often forage for ground squirrels over agricultural lands. Fallow fields can attract other foraging birds, including Brewer's blackbird (*Euphagus cyanocephalus*) and killdeer (*Charadrius vociferus*).

Ruderal

Ruderal areas are not currently in active use, but have been subject to intense or recurring disturbance, generally through removal or other alteration of all native vegetation, alteration of topography, soil compaction, and the addition or removal of man-made features such as paving, buildings, and channelization of watercourses. Depending on the intensity and type of disturbance and time since disturbance, ruderal areas can remain relatively barren or become revegetated with primarily non-native weedy species. Within the project area, ruderal areas are generally located along Highway 1, Highway 156, and Highway 183, along Monte Road north of the Salinas River, along the dirt agricultural road north of Tembladero Slough, within MRWPCA Regional Wastewater Treatment Plant, along Del Monte Boulevard at Reservation Road, and along Del Monte Boulevard at Canyon Del Rey Boulevard.

All ruderal areas are dominated by non-native weedy vegetation; however, the dominant species varies depending on the site characteristics at each location. Dominant species include field mustard (*Brassica rapa*), radish (*Raphanus sativus*), dwarf nettle (*Urtica urens*), and common chickweed (*Stellaria media*). Unidentifiable herbicide-treated weeds occur at the ruderal area near the intersection of Del Monte Boulevard and Canyon Del Rey Boulevard.

Ruderal includes the following vegetation alliance as mapped by AECOM (2016):

- Perennial pepper weed patches (*Lepidium latifolium* Herbaceous Semi-Natural Alliance)
- Ruderal

Ruderal communities do not support the diversity of native plant or wildlife that is characteristic of undisturbed natural communities, but many native wildlife species have adapted to ruderal areas: red-tailed hawk, American crow (*Corvus brachyrhynchos*), white-crowned sparrow (*Zonotrichia leucophrys*), American goldfinch (*Spinus tristis*), raccoon (*Procyon lotor*), and coyote (*Canis latrans*) are examples. Non-native animal species that are associated with ruderal communities include European starling (*Sturnus vulgaris*), rock dove (*Columba livia*), Virginia opossum (*Didelphis virginiana*), and Norway rat (*Rattus norvegicus*).

Developed/Landscaped

Developed and landscaped areas occupy much of the project area, particularly within the cities of Seaside and Monterey, and along Charles Benson Road in unincorporated Monterey County. Developed areas include paved and dirt roadways and trails, parking lots, buildings, and other manmade features. Landscaped features occur in association with these developed features and include gardens, parks, lawns, and landscaping trees and shrubs, such as planted stands of Monterey cypress and Monterey pine.

Developed and landscaped include the following vegetation alliances as mapped by AECOM (2016):

- Eucalyptus groves (*Eucalyptus* [*globulus, camaldulensis*] Woodland Semi-Natural Alliance)
- Acacia shrubland (Acacia Shrubland)
- Monterey cypress stands (*Hesperocyparis macrocarpa* Woodland Special Stands)
- Monterey pine woodland (*Pinus radiata* Forest Alliance)

As with agricultural areas, developed and landscaped areas can support wildlife species that have adapted to site disturbance but native plants are often absent and wildlife abundance and diversity are generally low. Striped skunks, raccoons, and Virginia opossums occur regularly in urban areas. Birds adapted to the urban landscape include house finches (*Haemorhous mexicanus*), northern mockingbirds (*Mimus polyglottos*), mourning doves, European starlings, house sparrows (*Passer domesticus*), and rock doves.

Open Water

Non-vegetated waters include relatively permanently inundated rivers and streams, tidal sloughs, lakes, and ponds, and may also include some small drainages and ditches. Open water is typically bordered by one or more of the preceding wetland or riparian vegetation types. As habitat, they are occupied by fish, amphibians, and reptiles, and other aquatic organisms, and are accessed as water and food sources by birds and mammals.

4.6.1.5 Sensitive Natural Communities and Environmentally Sensitive Habitat Areas

Sensitive Natural Communities

Sensitive natural communities (or special-status native plant communities) are designated as such by various resource agencies, such as CDFW, or in local policies and regulations and are generally considered to have important functions or values for wildlife or humans and/or are recognized as declining in extent or distribution and are considered threatened enough to warrant some sort of protection. For example, many local agencies in California consider protection of oak woodlands important for their value as an ecosystem and federal, state, and most local agencies classify wetlands and riparian areas as sensitive communities. The CNDDB tracks communities that are considered to be important for habitat conservation; these sensitive natural communities are considered special-status for the purposes of this analysis.

Several of the vegetation communities that occur in the project area are considered sensitive natural communities for the purposes of this analysis for one or more of the following reasons: (a) they are considered a sensitive natural community by CDFW; and/or (b) they are considered a sensitive community by one or more of the affected local jurisdictions, or are designated as a sensitive community in one or more of the general plans applicable to the project area.

The following communities occur in the study area and are considered special-status natural communities for the purposes of this analysis: central dune scrub, central maritime chaparral, northern coastal scrub, riparian woodland and scrub, freshwater marsh, and coast live oak woodland. Section 4.6.1.10, Sensitive Terrestrial Biological Resources in the Study Area, below, describes the distribution of these communities in the study area.

Federally designated critical habitat either within or in close proximity to the proposed project is described in Section 4.6.1.9, Critical Habitat, below.

Environmentally Sensitive Habitat Areas

The Coastal Act defines Environmentally Sensitive Habitat Areas (ESHA) as "any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments" (Pub. Res. Code §30107.5). ESHA is designated within the coastal zone by the CCC or in an applicable local coastal program.

In areas where a local coastal program has been developed and approved, the local coastal program may include a separate definition of ESHA. The proposed project is within the jurisdiction of three local coastal programs: City of Marina's LCLUP, Monterey County's North County Land Use Plan, and the City of Seaside Local Coastal Program Land Use Plan. The definitions of ESHA in each of these local coastal programs are provided below.

City of Marina Local Coastal Land Use Plan

The City of Marina's LCLUP designates areas protected within the coastal zone as primary and secondary habitats. For the purpose of this analysis, this document assumes that both primary and secondary habitat would correspond with the CCC's definition of ESHA. The definitions of primary and secondary habitat are described in Exhibit A of the City of Marina's LCLUP (2013) and provided below.

Primary habitat. This term includes all of the environmentally sensitive habitat areas in Marina. These are as follows:

1. Habitat for all identified plant and animal species which are rare, endangered, threatened, or are necessary for the survival of an endangered species. These species will be collectively referred to as "rare and endangered."
2. Vernal ponds and their associated wetland vegetation. The Statewide Interpretive Guideline for Wetlands and Other Wet Environmentally Sensitive Habitat Areas (California Coastal Commission, February 14, 1981) contains technical criteria for establishing the inland boundary of wetland vegetation.
3. All native dune vegetation, where such vegetation is extensive enough to perform the special role of stabilizing Marina's natural sand dune formations.
4. Areas otherwise defined as secondary habitat that have an especially valuable role in an ecosystem for sensitive plant or animal life, as determined by a qualified biologist approved by the City.

Secondary habitat. This term refers to areas adjacent to primary habitat areas within which development must be sited and designed to prevent impacts which would significantly degrade the primary habitat. The secondary habitat area will be presumed to include the following, subject to more precise determination upon individual site investigation:

1. The potential/known localities of rare and endangered plant species as shown on "Disturbed Vegetation" map in the Marina Local Coastal Program.
2. The potential wildlife habitats as shown "Potential Wildlife Habitats" map in the Marina Local Coastal Program.
3. Any area within 100 feet of the landward boundary of a wetland primary habitat area.

Rare and endangered species. This term will apply to those plant and animal species which are rare, endangered, threatened or are necessary for the survival of such species. The Environmental Analysis Report prepared for the Marina Local Coastal Program identified such species in the dune habitat areas. While future scientific studies may result in addition or deletion of species, the list presently includes:

1. Smith's Blue Butterfly (*Shijimiaeoides enoptes smithi*)
2. Globose Dune Beetle (*Coelus globosus*)
3. Black Legless Lizard (*Anniella pulchra nigra*)
4. Salinas Kangaroo Rat (*Dipodomys heermanni goldmani*)
5. Seaside Painted Cup (*Castilleja latifolia* ssp. *latifolia*)
6. Monterey Spine Flower (*Chorizanthe pungens* var. *pungens*)
7. Eastwood's Ericameria (*Ericameria fasciculate*)
8. Coast Wallflower (*Erysimum ammophilum*)
9. Menzies' Wallflower (*Erysimum menziesii*)
10. Coastal Dunes Milk Vetch (*Astragalus tener* var. *titi*)
11. Dune Gilia (*Gilia tenuiflora* var. *arenaria*)
12. Wild Buckwheat (*Eriogonum latifolium*)*
13. Wild Buckwheat (*Eriogonum parvifolium*)*
14. Bush Lupine (*Lupinus* ssp.)+

* only within the range of Smith's Blue Butterfly.
\+ only within the range of the Black Legless Lizard.

Monterey County North County Land Use Plan

Section 2.3 of the North County Land Use Plan defines Environmentally Sensitive Habitats as "areas in which plant or animal life or their habitats are rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments. These include Areas of Special Biological Significance as identified by the State Water Resources Control Board; rare and endangered species habitat, all coastal wetlands and lagoons, all marine wildlife, and kelp beds; and indigenous dune plant habitats" (Monterey County, 1999).

City of Seaside Local Coastal Program Land Use Plan

Policy LUD-CZ 1.2.A of the City of Seaside Local Coastal Program Land Use Plan defines ESHA as "any area in which plant or animal life or their habitats are either rare, or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments" (City of Seaside, 2013).

Environmentally Sensitive Habitat Areas in the Study Area

The exact limits of primary and secondary habitat within the study area, as defined in the City of Marina's LCLUP, and ESHA, as defined in the Coastal Act, North County Land Use Plan, and City of Seaside Local Coastal Program Land Use Plan, have not been verified by the CCC or any local agencies. ESA and AECOM biologists met with representatives from the CCC for guidance on the limits of primary habitat, secondary habitat, and ESHA within the study area on May 19 and July 19, 2017, but as of publication of this Final EIR/EIS, the CCC has not made a formal determination of the limits of these areas.

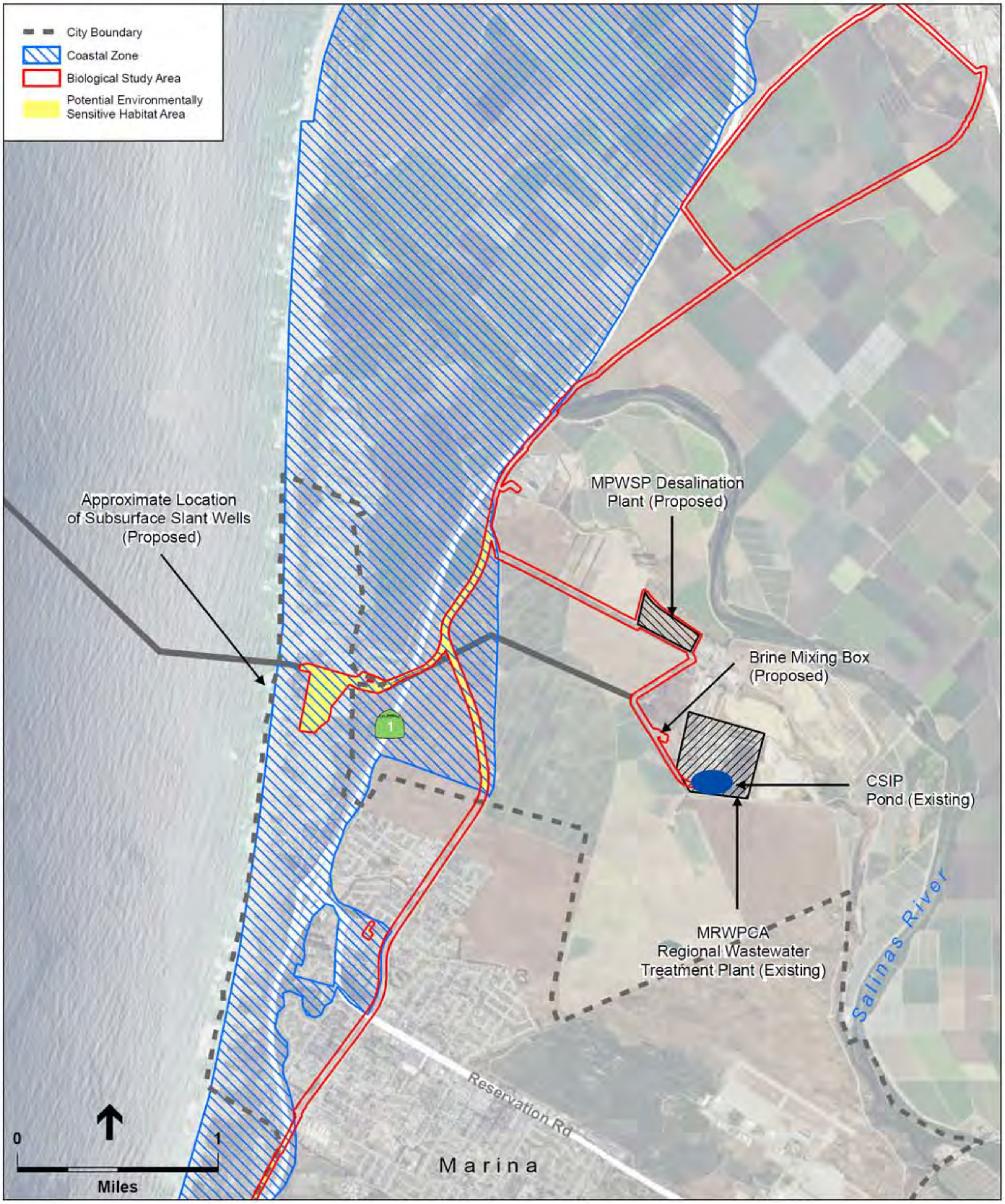
In the absence of a formal determination, and based on the definitions of primary habitat, secondary habitat, and ESHA described above and on guidance from the CCC, this document assumes that all undeveloped areas within the coastal zone would be considered primary habitat (within the City of Marina's LCLUP jurisdiction) and ESHA in all other jurisdictions. Potential ESHA within the study area is shown in **Figures 4.6-2a** and **4.6-2b**. The CCC and/or local agencies may determine that some portions of the undeveloped areas are secondary habitat (within the coastal zone in the City of Marina) or receive no protection through the Coastal Act or a local coastal program. For example, a portion of the segment of the proposed new Transmission Main within the coastal zone in the City of Marina that parallels the Transportation Agency for Monterey County (TAMC) right-of-way north of Lightfighter Drive for approximately 2 miles may be considered secondary habitat by the City of Marina. This area may not meet item number 3 in the definition of primary habitat. This area is located east of Beach Range Road and the TAMC railroad tracks embankment and west of and adjacent to the Monterey Peninsula Recreational Trail. The sparse dune vegetation in this area, which is in the depression between the railroad track embankment and the elevation of the recreational trail, does not contribute to stabilization of dune formations.

4.6.1.6 Wetlands and Other Waters

Wetlands are ecologically productive habitats that support a rich variety of both plant and animal life. The importance and sensitivity of wetlands has increased as a result of their value as recharge areas and filters for water supplies and widespread filling and destruction to enable urban and agricultural development.

USACE jurisdiction typically extends to the limit of the wetland, as defined by the presence of hydrophytic vegetation, hydric soils, and wetlands hydrology. In contrast, CCC jurisdiction for wetlands may extend to the limit of any one of the above parameters and therefore typically is much broader than USACE jurisdiction. However, the CCC only has jurisdiction over wetlands and waters located within the coastal zone. Additionally, the RWQCB also regulates wetlands, other waters of the U.S., and waters of the state. The main channels of the Elkhorn Slough are under the jurisdiction of the Monterey Bay National Marine Sanctuary. Federal and state definitions of wetlands and waters are further detailed in Section 4.6.2, Regulatory Framework.

Wetlands or waters potentially regulated by the USACE, RWQCB, and/or CCC within the study area were mapped by AECOM during field surveys conducted between 2014 and 2016 (AECOM, 2016) and have been summarized in a wetland delineation report prepared for the proposed project (AECOM, 2017). Additionally, ESA mapped any potentially jurisdictional wetlands or waters within the study area during field surveys conducted in 2013, 2014, and 2016 for the MPWSP (ESA, 2013, 2014, 2016). Many potentially jurisdictional wetlands and waters occur within the study area and include the following vegetation community/habitat types described in Section 4.6.1.4 above: riparian woodland and scrub, freshwater marsh, and open water, as well as



SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-2a
Potential Environmentally Sensitive Habitat Areas in the Biological Study Area

SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-2b

Potential Environmentally Sensitive Habitat Areas in the Biological Study Area a few small culverts and drainages present within the study area. These potential wetlands and waters are shown on **Figures 4.6-1a** through **4.6-1o**. The wetland delineation report would need to be approved by the agencies to determine the limits of jurisdictional wetlands and waters within the project area.

The USFWS NWI[6] was queried to identify wetlands and other surface waters that have been mapped within, or in close proximity to, the study area. The NWI data represents reconnaissance-level information on the location, type, and size of surface waters that was developed on-screen using digital datasets. Since this data is not collected in the field, and because the definition of wetlands can vary among regulatory agencies, the wetland delineation would need to be verified to confirm the limits of jurisdictional wetlands and waters mapped by the NWI. Several potentially jurisdictional wetlands and/or other waters have been mapped by the NWI within, or in close proximity to, the study area. These features are shown on **Figures 4.6-1a** through **4.6-1o** and include a variety of wetland and other water types such as estuarine and marine deepwater, estuarine and marine wetland, freshwater emergent wetland, freshwater forested/shrub wetland, freshwater pond, lake, and riverine.

In the absence of a verified wetland delineation by the USACE, RWQCB, and CCC, this document assumes that all potential jurisdictional features identified in the surveys described above and by the NWI may be considered jurisdictional by the USACE, RWQCB, and CCC.

Wild and Scenic Rivers

The federal Wild and Scenic Rivers Act was enacted by Congress in 1968 for the purpose of preserving the free-flowing characteristics and outstanding remarkable values of designated rivers while allowing uses compatible with the management goals of designated rivers. The categories of outstanding remarkable values include scenic, recreational, geologic, fish and wildlife, historic, and cultural values. The California Wild and Scenic Rivers Act of 1972 is modeled after the federal Wild and Scenic Rivers Act. There are no designated wild and scenic rivers within the study area.

4.6.1.7 Wildlife Movement Corridors

Wildlife movement corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or by areas of human disturbance or urban development. Topography and other natural factors in combination with urbanization have fragmented or separated large open space areas. The fragmentation of natural habitat creates isolated “islands” of vegetation that may not provide sufficient area to accommodate sustainable populations and can adversely impact genetic and species diversity. Movement corridors offset the effects of this fragmentation by allowing animals to move between remaining habitats, which in turn allows depleted populations to be replenished and promotes genetic exchange with separate populations.

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6 The NWI is a nationwide inventory of wetlands and other surface waters that is compiled by the USFWS to provide information on the distribution and type of wetlands and aid in conservation efforts.

The majority of the study area comprises developed areas, or adjacent to developed areas, such as roads and recreational trails, which do not serve as wildlife movement corridors. Although some common wildlife travel along developed areas, wildlife likely move parallel to these developed areas along relatively undeveloped stretches of beach and dune habitat located west and east of the project area. Lands north of Marina are used for agricultural purposes, but may serve as a movement corridor between coastal and inland areas for species adapted to agricultural disturbance such as raptors and songbirds. The Salinas River provides a wildlife movement corridor for fish, birds, and other species that migrate locally along riparian corridors.

4.6.1.8 Special-Status Species

For the purposes of this EIR/EIS, "special-status species" include threatened, endangered, candidate, and other sensitive species identified in local and regional plans, policies, and regulations, and by the CDFW, USFWS, and NMFS.[7] Special-status species include those species listed in Section 15380(b), Section 15380(c), and Section 15380(d) of the CEQA Guidelines. Special-status species include:[8]

- Plant and wildlife species listed as rare, threatened, and endangered under the FESA and CESA;
- Candidate species (species that are proposed for listing under either federal or state law);
- Species designated by CDFW as species of special concern or Fully Protected Species;
- Species protected by the federal Migratory Bird Treaty Act (MBTA) (16 USC §§ 703-711) and California Fish and Game Code;
- Bald and golden eagles protected by the federal Bald Eagle Protection Act (16 USC § 668); and
- Species that may be considered rare or endangered pursuant to Section 15380 of the CEQA Guidelines (including plants species with California Rare Plant Ranks of 1, 2, 3, or 4).

Data on species occurrence was obtained from the CDFW, the CNDDB, the CNPS Electronic Inventory, the USFWS species list, published biological literature of the region, and site surveys as described in Section 4.6.1.2 above.

7 Marine biological resources under NMFS authority are covered in Section 4.5, Marine Resources.

8 CEQA Guidelines Section 15380(b) states "A species of animal or plant is: (1) "endangered" when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors; or (2) "rare" when either: (A) Although not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or (B) The species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered "threatened" as that term is used in the Federal Endangered Species Act."

CEQA Guidelines Section 15380(c) states: "A species of animal or plant shall be presumed to be endangered, rare or threatened, as it is listed in: (1) Sections 670.2 or 670.5, Title 14, California Code of Regulations; or (2) Title 50, Code of Federal Regulations Section 17.11 or 17.12 pursuant to the Federal Endangered Species Act as rare, threatened, or endangered."

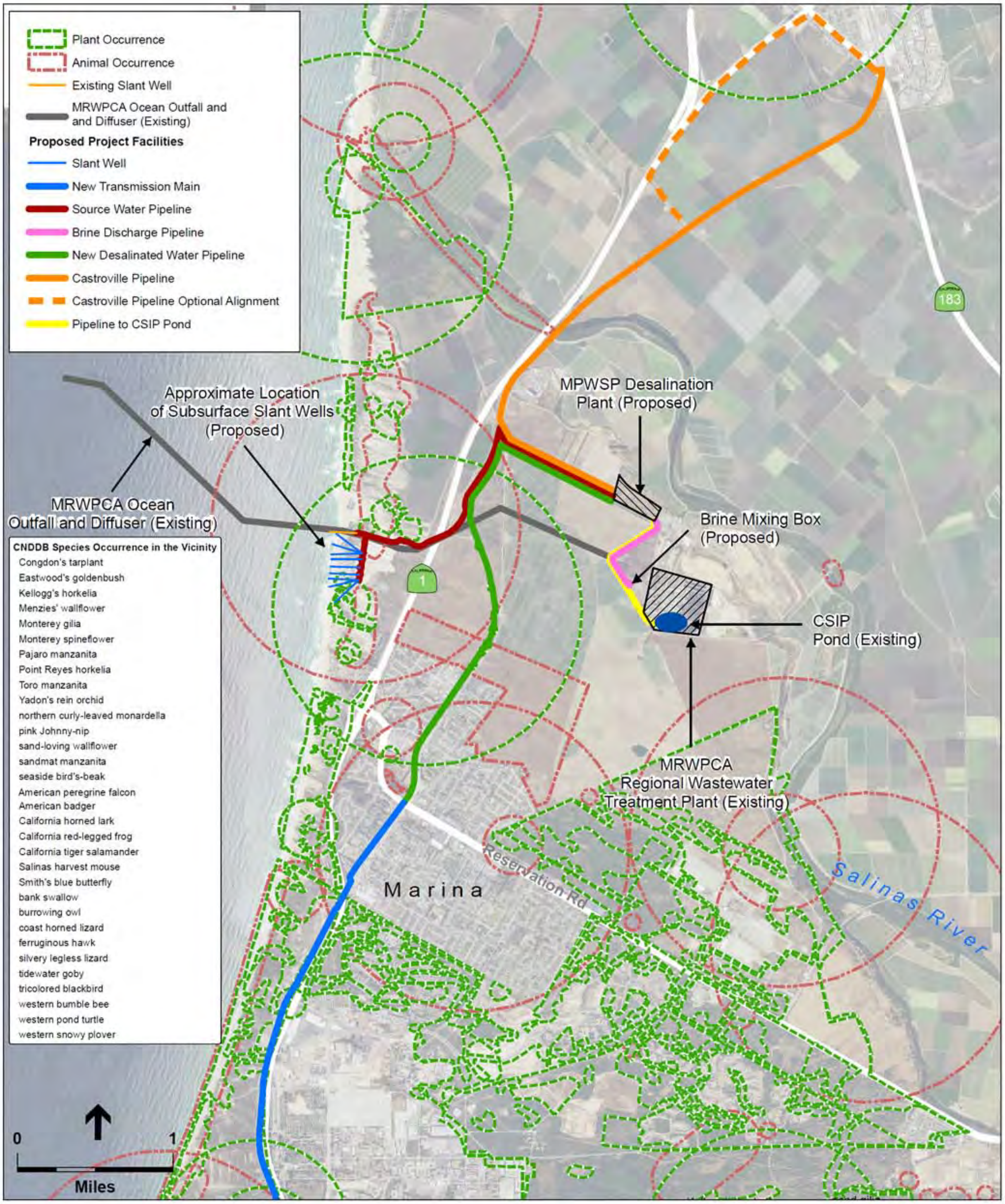
CEQA Guidelines Section 15380(d) states: "A species not included in any listing identified in subdivision (c) shall nevertheless be considered to be endangered, rare or threatened, if the species can be shown to meet the criteria in subdivision (b)."

Table F-1 in Appendix F lists the special-status plant and animal species that have been documented to occur or have the potential to occur in suitable habitat within the project area. The table also includes an assessment of potential to occur within the project area based on previous special-status record locations and current site conditions. Special-status species with a moderate or higher potential to occur within the project area are discussed in detail below.

Figures 4.6-3a, **4.6-3b**, and **4.6-3c** show the CNDDB occurrence records in the project vicinity.

Seven federal and/or state listed plant species occur in the project area or have a moderate to high potential to occur within the project area. These species include Monterey spineflower, robust spineflower (*Chorizanthe robusta* var. *robusta*), seaside bird's-beak, Menzies' wallflower (*Erysimum menziesii*), sand gilia, Yadon's rein orchid (*Piperia yadonii*), and Pacific Grove clover (*Trifolium polyodon*). Four federal and/or state listed animal species occur in or have a moderate to high potential to occur within the project area including Smith's blue butterfly, California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana draytonii*), and western snowy plover (*Charadrius alexandrinus nivosus*). Twenty-two non-listed special-status plant species are either known to occur within the project area or have a moderate to high potential to occur within the project area. These include Hickman's onion (*Allium hickmanii*), Hooker's manzanita (*Arctostaphylos hookeri* ssp. *hookeri*), Toro manzanita (*Arctostaphylos montereyensis*), Pajaro manzanita (*Arctostaphylos pajaroensis*), ocean bluff milkvetch (*Astragalus nuttallii var. nuttallii*), sandmat manzanita, Monterey Coast paintbrush (*Castilleja latifolia*), Monterey ceanothus (*Ceanothus rigidus*), Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*), branching beach aster (*Corethrogyne filaginifolia* [formerly *leucophylla*]), Eastwood's goldenbush, sand-loving wallflower (*Erysimum ammophilum*), Kellogg's horkelia, Carmel Valley bush-mallow (*Malacothamnus palmeri* var. *involucratus*), marsh microseris (*Microseris paludosa*), northern curly-leaved monardella (*Monardella sinuata* ssp. *nigrescens*), south coast branching phacelia (*Phacelia ramosissima* var. *austrolitoralis*), native stands of Monterey pine, Michael's rein orchid (*Piperia michaelii*), Santa Cruz microseris (*Stebbinsoseris decipiens*), and Santa Cruz clover (*Trifolium buckwestiorum*).

Twenty-five non-listed special-status animal species are either known to occur or have a moderate to high potential to occur within the project area. These include globose dune beetle (*Coelus globosus*), western pond turtle (*Actinemys marmorata*), black legless lizard, silvery legless lizard *(Anniella pulchra pulchra*), coast horned lizard (*Phrynosoma blainvillii*), Coast Range newt (*Taricha torosa*), tricolored blackbird (*Agelaius tricolor*), short-eared owl (*Asio flammeus*), western burrowing owl (*Athene cunicularia*), red-tailed hawk, red-shouldered hawk (*Buteo lineatus*), Ferruginous hawk (*Buteo regalis*), northern harrier (*Circus cyaneus*), white-tailed kite, California horned lark (*Eremophila alpestris actia*), American peregrine falcon (*Falco peregrinus*), American kestrel (*Falco sparverius*), loggerhead shrike (*Lanius ludovicianus*), California yellow warbler (*Setophaga petechia brewsteri*), pallid bat (*Antrozous pallidus*), Salinas kangaroo rat (*Dipodomys heermanni goldmani*), western red bat (*Lasiurus blossevillii*), Monterey dusky-footed woodrat, Monterey shrew (*Sorex ornatus salaries*), and American badger (*Taxidea taxus*).

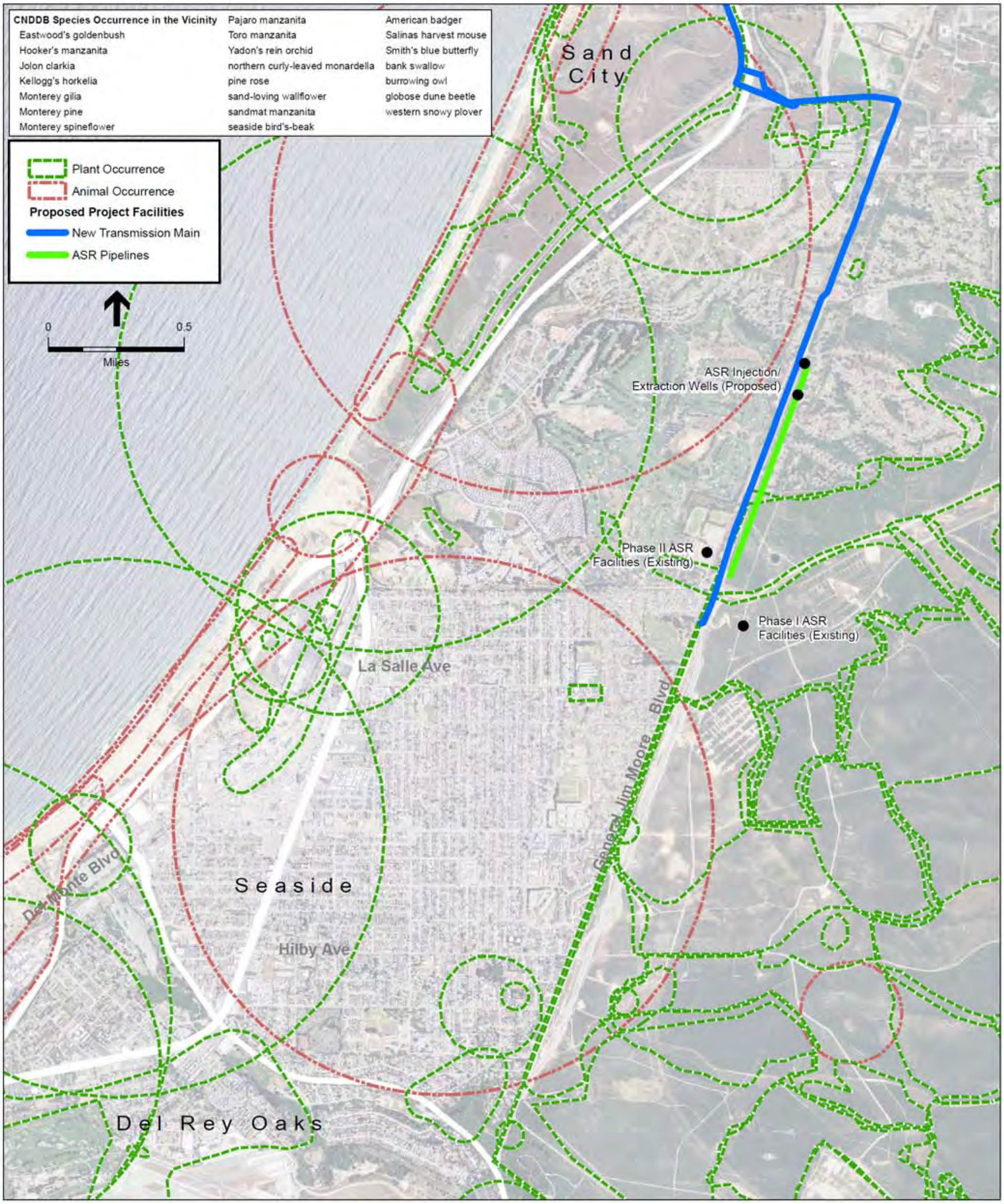


SOURCE: CDFW, 2016; ESA, 2016

CNDDB version 12/2016. Please Note: The occurrences shown on this map represent the known locations of the species listed here as of the date of this version. There may be additional occurrences or additional species within this area which have not yet been surveyed and/or mapped. Lack of information in the CNDDB about a species or an area can never be used as proof that no special status species occur in an area.

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-3a
CNDDB Occurrence Records



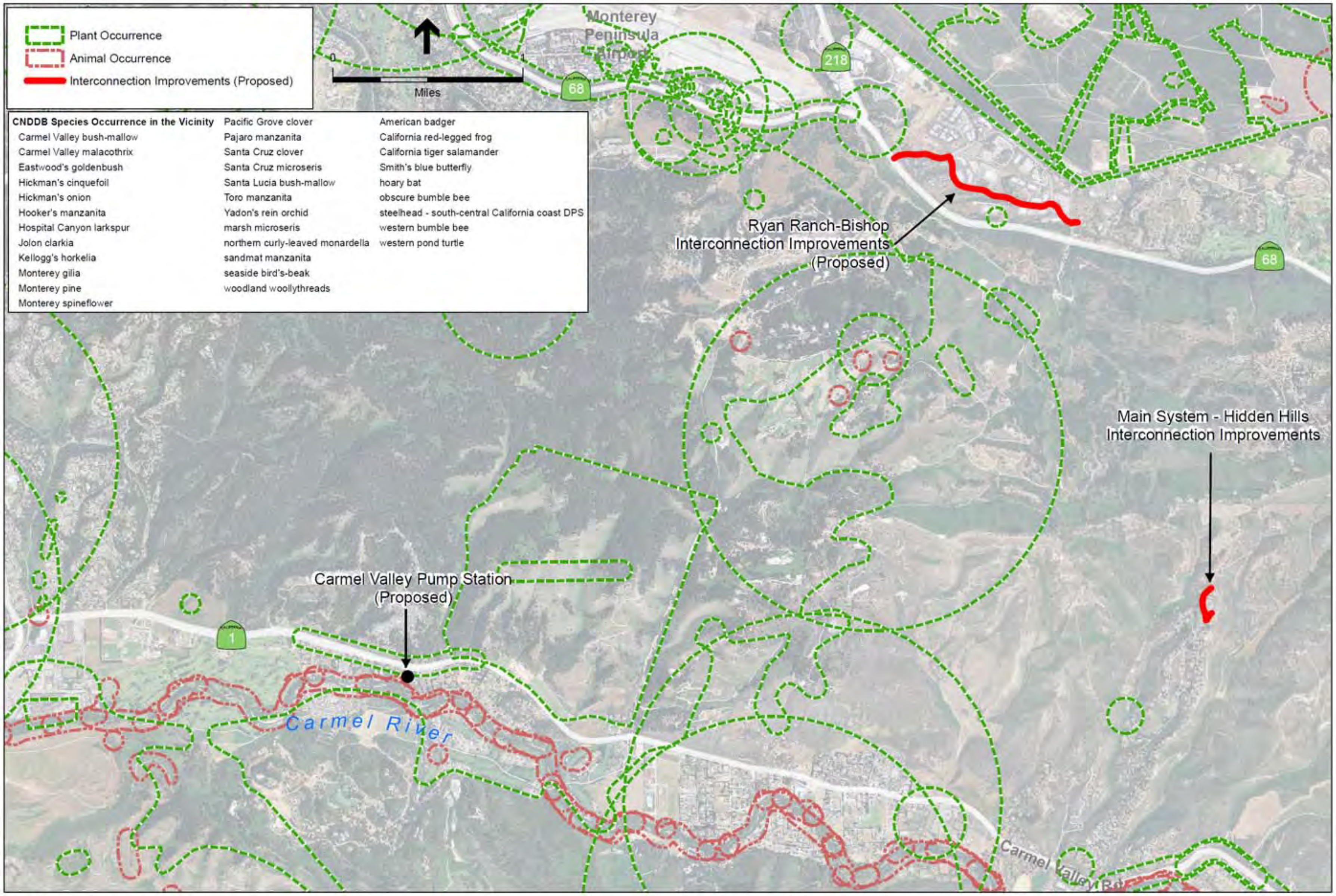
SOURCE: CDFW, 2016; ESA, 2016

CNDDB version 12/2016. Please Note: The occurrences shown on this map represent the known locations of the species listed here as of the date of this version. There may be additional occurrences or additional species within this area which have not yet been surveyed and/or mapped. Lack of information in the CNDDB about a species or an area can never be used as proof that no special status species occur in an area.

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-3b

CNDDB Occurrence Records



SOURCE: CDFW, 2016; ESA, 2016

CNDDB version 12/2016. Please Note: The occurrences shown on this map represent the known locations of the species listed here as of the date of this version. There may be additional occurrences or additional species within this area which have not yet been surveyed and/or mapped. Lack of information in the CNDDB about a species or an area can never be used as proof that no special status species occur in an area.

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-3c

CNDDB Occurrence Records

Numerous native birds also are likely to occur in the project area. These birds, protected under the MBTA and California Fish and Game Code, are likely to nest locally from March through August, with most nesting occurring April through July.

Federal and State Endangered and/or Threatened Species

Plants

Monterey spineflower (*Chorizanthe pungens* var. *pungens*). Monterey spineflower is federally listed as threatened and a CRPR 1B.2 taxon. It is a small, low-growing, annual herb in the buckwheat family (Polygonaceae) inhabiting the sandy soils of coastal and inland marine terraces in northern Monterey County. Monterey spineflower occurs in disturbed areas in grassland, such as road cuts and eroded areas, or in shifting sands of coastal dunes. It is also associated with sand blowouts in areas partially stabilized by iceplant. Monterey spineflower requires a relatively bare substrate for establishment and growth and is threatened by the encroachment of nonnative annual grasses and perennial weed species.

Populations of Monterey spineflower are known from a variety of locations within and adjacent to the project area. This species has been mapped widely within the former Fort Ord military base including the Fort Ord Dunes State Park near the new Transmission Main alignment south of Reservation Road, along General Jim Moore Boulevard near the new Transmission Main and ASR pipeline alignments (USACE, 1997; Fort Ord Reuse Authority, 2012; CDFW, 2016). During botanical surveys conducted for the proposed project, ESA observed this species in disturbed coastal dune scrub north of Reservation Road along the proposed new Desalinated Water Pipeline alignment on Lapis Road and the west side of Del Monte Boulevard (ESA, 2012; 2016). In 2010, Monterey spineflower was observed along the proposed Source Water Pipeline alignment along Lapis Road and the CEMEX access road (ESA, 2010). Additionally, Zander Associates biologists observed this species adjacent to the CEMEX access road in 2013 and 2014 at the proposed Source Water Pipeline alignment (Zander Associates, 2013; 2014). During botanical surveys conducted at the CEMEX sand mining facility in 2014 and 2016 in support of this project, ESA found Monterey spineflower in high densities scattered throughout portions of the active mining area, including at the proposed subsurface slant well sites (ESA, 2014; 2016). Other populations have been observed within central dune scrub and disturbed areas east of Lapis Road and north of the CEMEX access road (CDFW, 2016). It was also observed within the Castroville Pipeline alignment (AECOM, 2016).

This species occurs in both undisturbed and disturbed central dune scrub, non-native grassland, central maritime chaparral, northern coastal scrub, and ice plant mat communities and has a moderate to high potential to occur along the east side of General Jim Moore Boulevard in the vicinity of the proposed ASR facilities.

Robust spineflower (*Chorizanthe robusta* var. *robusta*). Robust spineflower is federally listed as endangered and a CRPR 1B.1 taxon. It is an annual herb that blooms from April through September. This species grows in sandy or gravelly soils of coastal dune scrub. Robust spineflower is threatened by development, mining, recreation, and non-native plants. According to USFWS, this species is currently limited to Santa Cruz County, but has been historically documented in Monterey County (USFWS, 2010a). This species was not observed within the project area during the botanical surveys conducted for the proposed project. Although this species is not currently known within Monterey County, it has been historically observed in the project vicinity and has potential to occur within central dune scrub and maritime chaparral at the CEMEX active mining area; along the Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main; and on the east side of General Jim Moore Boulevard in the vicinity of the proposed ASR facilities.

Seaside bird's-beak (*Cordylanthus rigidus* var. *littoralis*). Seaside bird's-beak is state listed as endangered and a CRPR 1B.1 taxon. It is a relatively large, many-branched, annual herb in the broomrape family (Orobanchaceae) that blooms from May through October. This species grows in the sandy soils of stabilized dunes and is associated with Monterey pine forest, oak woodland, and maritime chaparral. Like other annual plants of sandy soils, seaside bird's-beak generally requires regular ground disturbance to maintain a bare substrate and control competition with non-native grasses and perennial species. According to the CNDDB, this species has been documented on sand dunes in Sand City, Marina, Seaside, and Monterey although these records are all prior to 1950 and populations in these areas may have been extirpated (CDFW, 2016). This species may occur in suitable habitat, such as central dune scrub, maritime chaparral, and coast live oak woodland at the proposed subsurface slant well site (e.g., the CEMEX sand mining facility); along the Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main alignments; and at the ASR-5 Well and ASR-6 Well sites, along the ASR Conveyance Pipeline alignment, along the ASR Pump-to-Waste Pipeline and the ASR Recirculation Pipeline alignment.

Menzies' wallflower (*Erysimum menziesii*). Menzies' wallflower is federal and state listed as endangered and a CRPR 1B.1 taxon. Originally, it was thought that two subspecies (*Erysimum menziesii* ssp. *menziesii* and ssp. *yadonii*) occur within Monterey County, with subspecies *menziesii* occurring in a disjunct distribution in Monterey and Mendocino Counties and subspecies *yadonii* restricted to coastal dunes between the mouth of the Salinas River and the former Fort Ord military base (USFWS, 2008). However, the most recent update to the Jepson Manual only recognizes the species and not these two subspecies (Jepson Flora Project, 2013). This species is a biennial or perennial plant in the mustard family and produces yellow flowers from June through August. It was observed within the new Transmission Main alignment near the intersection of Lightfighter Drive and Highway 1 during surveys conducted for the proposed project in 2014 (URS, 2014b). This species occurs at the foredunes north of the CEMEX sand mining facility (CDFW, 2016) and was observed in this same area during botanical surveys conducted for the proposed project in 2012 and 2016 (ESA, 2012; 2016). It also occurs in sand dunes north and south of the CEMEX facility (CDFW, 2016). This species has potential to occur in central dune scrub at the proposed subsurface slant well site and along the proposed Source Water Pipeline, and new Desalinated Water Pipeline alignments.

Sand gilia (*Gilia tenuiflora* ssp. *arenaria*). Sand gilia is federally listed as endangered, state listed as threatened, and a CRPR 1B.2 taxon. It is a small, erect annual in the phlox family (Polemoniaceae) blooming from April through June. A rare associate of the maritime chaparral, coastal scrub, and oak woodland communities of northern Monterey County, sand gilia favors bare substrates created by unstable soil conditions. Sand gilia often occurs with Monterey spineflower, which is a federally threatened and CRPR 1B.2 species,[9] with similar ecological requirements; however, a more common associate is wand woollystar (*Eriastrum virgatum*). Changes in dune vegetation have greatly reduced the amount of suitable habitat for these disturbance-dependent species, and many remaining populations are associated with roadsides, eroded drainages, and recently burned chaparral. This species has been observed in sand dunes throughout the project area. Within the immediate project vicinity it has been observed at Marina State Beach south of the CEMEX sand mining facility; in central dune scrub north of the CEMEX sand mining facility; within the proposed new Transmission Main alignment near the intersection of Imjin Parkway and Highway 1; in dune scrub west of Auto Center Parkway; at a location[10] east of General Jim Moore Boulevard in the vicinity of the ASR facilities; at a former Fort Ord military base property located approximately 1.2 miles south of the intersection of Del Monte Boulevard and Reservation Road and just east of Highway 1; and at Marina State Beach approximately 1.4 miles south of the intersection of Del Monte Boulevard and Reservation Road and just west of Highway 1 (CDFW, 2016). Based on the broad distribution of occurrence records within the project area, this EIR/EIS assumes sand gilia could potentially occur in central dune scrub and central maritime chaparral at the subsurface slant wells site, along the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline alignments, and at the ASR-5 Well and ASR-6 Well sites.

Yadon's rein orchid (*Piperia yadonii*). Yadon's rein orchid is federally listed as endangered and a CRPR 1B.1 taxon. It is a slender perennial herb in the orchid family (Orchidaceae) that blooms from May through August. This species occurs in Monterey pine forest with a sparse understory, and along ridges and other areas of shallow soil within maritime chaparral. Unlike many other rare plants associated with maritime chaparral, Yadon's rein orchid does not colonize bare ground following disturbance events; instead, this species requires bare areas that remain relatively stable over time, allowing plants to form symbioses with host-specific mycorrhizal fungi. CNDDB occurrence records for this species in the project vicinity are mostly limited to areas south and west of the Monterey Regional Airport (CDFW, 2016). This species has been documented east of Highway 1 and north of Imjin Parkway (CDFW, 2016). It has also been documented approximately 0.3 mile north of the proposed Ryan Ranch-Bishop Interconnection Improvements (Fort Ord Reuse Authority, 2012). Yadon's rein orchid has the potential to occur near the Main System-Hidden Hills Interconnection Improvements site, and at the ASR-5 and ASR-6 Wells sites, along the ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline alignments.

Pacific Grove clover (*Trifolium polyodon*). Pacific Grove clover is state listed as rare and a CRPR 1B.1 taxon, though possibly of hybrid origin (Baldwin, et al, 2012). It is a small semi-prostrate annual plant in the pea family (Fabaceae) that flowers from April to June. Pacific Grove clover occurs on mesic sites in closed-cone coniferous forest (i.e., Monterey pine and cypress),

[9] CRPR 1B consists of plants that are rare, threatened, or endangered in California and elsewhere. The 0.2 extension indicates that the plant is "Moderately endangered in California" and reflects the level of threat to the species.

[10] As reported in the CNDDB (CDFW, 2016), the exact location of this occurrence record is unknown, but is mapped as a large polygon east of General Jim Moore Boulevard based on a map in "Flora and Fauna Baseline Study of Fort Ord."

and in grasslands, coastal prairie or meadow habitat on marine terraces, and in swales in dunes. It has been documented at several locations on the west side of the Monterey Peninsula, on Point Lobos, and in a few other locations near Jack's Peak and in Carmel Valley (CDFW, 2016). Historical records suggest it may once have been more widespread in the vicinity of Monterey and Pacific Grove, but has likely been displaced by residential and golf course development of marine terrace grasslands and forests (Jones & Stokes, 1996). Although it can occur on sites with some ongoing disturbance, the MPWSP facilities located closest to known or potential populations (Ryan Ranch-Bishop Interconnection Improvements and Main System-Hidden Hills Interconnection Improvements) would be in previously developed locations, such as roads.

Invertebrates

Smith's blue butterfly (*Euphilotes enoptes smithi*). Smith's blue butterfly is federally listed as endangered. It is a small butterfly endemic to the central coast of California. This species relies on two host plants—coast buckwheat and seacliff buckwheat (*Eriogonum parvifolium*)—during all of its life stages. These two host plant species are found in coastal sand dunes and chaparral. Smith's blue butterfly uses the flower heads of these plants for feeding, mating, and egg-laying. Adults emerge during summer (June through September), and live approximately one week, during which time they mate. Eggs hatch shortly thereafter, and the caterpillars feed on the host plant then pupate for about 10 months (typically in the leaf litter below the plant) before emerging as adults the next summer. Adults also occasionally feed on nectar from naked buckwheat (*Eriogonum nudum*).

Smith's blue butterfly has been documented at several locations containing central dune scrub in the vicinity of the project area, from the city of Monterey to the south to the Salinas River National Wildlife Refuge to the north (CDFW, 2016; USACE, 1997; Fort Ord Reuse Authority, 2012). There is also a historical record from chaparral near Carmel Valley Village and two records near the Carmel school in Carmel Valley (CDFW, 2016). During 2012 botanical surveys conducted at the "north CEMEX site" located approximately 0.8 mile north of the CEMEX active mining area,[11] coast buckwheat, one of the two host plants for the Smith's blue butterfly, was observed in high densities in the sand dunes north of the CEMEX sand mining facility (ESA, 2012). Coast buckwheat was also observed in high densities along the CEMEX access road and in central dune scrub within the CEMEX active mining area and Smith's blue butterfly was observed in a mosaic of central dune scrub and ice plant mats during the 2016 botanical surveys of the CEMEX facility (Zander Associates, 2014; ESA, 2014; 2016). Coast buckwheat and seacliff buckwheat was found in central dune scrub along the new Transmission Main between Beach Road and Lightfighter Drive and coast buckwheat was observed along the Source Water Pipeline and new Desalinated Water Pipeline along Lapis Road. (AECOM, 2016; ESA, 2016). Smith's blue butterfly has the potential to occur at the locations where coast buckwheat has been observed.

[11] This location corresponds with the subsurface intake system described in CalAm's January 2013 Supplemental Testimony, which included up to 10 subsurface slant wells at the north CEMEX site. After input from resource agencies in March 2013 regarding impacts on western snowy plover habitat at this site, the subsurface intake system for the MPWSP was moved south to its current location in the CEMEX active mining area (see Chapter 7, Alternatives, regarding Preliminary Intake Option 1 at the north CEMEX site for additional discussion).

Fish

South- Central California Coast Steelhead (*Oncorhynchus mykiss*) Distinct Population Segment. The South-Central California Coast Steelhead (*Oncorhynchus mykiss*) Distinct Population Segment (SCCC DPS) is federally listed as threatened and considered a California species of special concern. Steelhead are anadromous, meaning that they spawn in freshwater, spend the first one to three years (or more) of life in freshwater, and then migrate to the ocean where they continue to grow and mature before returning to spawn in their natal streams. Steelhead populations within the Salinas River and Carmel River basins are part of the threatened SCCC DPS of the species. This DPS extends from the Pajaro River south to, but not including, the Santa Maria River. The Salinas River watershed is considered a part of the Interior Coast Range Biogeographic Population Group (BPG) and the Carmel River is included in the Carmel Basin BPG within the 2013 SCCC DPS Recovery Planning Area (NMFS, 2013).

Overall population of the SCCC DPS is understood to be extremely small (NMFS, 2013). Steelhead populations within the Salinas River watershed have not been well documented, like many watersheds within this DPS, but a few point estimates, summarized in NMFS (2007), are available:

- USFWS catch estimate of 3,600 adults in 1946
- USFWS average run-size estimate of 900 fish in 1951
- Kelley and Dettman estimate of less than 500 adults as of 1983

Based on the above trend and more recent population assessments conducted on the Arroyo Seco, NMFS (2007) concluded that the Salinas River run of steelhead has declined to an adult abundance averaging less than 50 fish and that this remnant population faces a host of risks intrinsic to the low abundance of various sub-populations within the watershed. Poor habitat conditions related to the majority loss of the Salinas River estuary, increase in erosion and sedimentation resulting from adjacent land uses (e.g. residential and agricultural development), water management and physical impediments (e.g. groundwater extraction and dams), and presence of invasive species (e.g., giant reed [*Arundo donax*] and striped bass [*Marone saxatilis*]) are considered the primary threats to the Interior Coast Range BPG population (NMFS, 2013). NMFS (2007) concluded that the Upper Salinas, Nacimiento/San Antonio, and Arroyo Seco River sub-populations face “very high”, “high”, and “fairly high” risks of extinction, respectively. Additional monitoring conducted at the Salinas River Weir between 2010 and 2014 to document steelhead passage counts, abundance, and migration timing detected 53 upstream passages in the most abundant monitoring season (2012-2013) (FISHBIO, 2014). Although there are no steelhead occurrences from the CNDDB in Tembladero Slough, steelhead have the potential to occur in that slough. The Castroville Pipeline would be installed beneath the Salinas River and Tembladero Slough via trenchless technologies.

Amphibians

California tiger salamander (*Ambystoma californiense*). California tiger salamander is federal and state listed as threatened. It is principally an upland species found in annual grasslands and in the grassy understory of valley-foothill hardwood communities in central and northern California.

It requires underground refuges (usually ground squirrel or other small mammal burrows), where it spends the majority of its annual cycle. Between December and February, when seasonal ponds begin to fill, adult California tiger salamanders engage in mass migrations to aquatic sites during a few rainy nights to breed. Adult tiger salamanders have been documented at distances of two kilometers (1.2 miles) from breeding ponds (Orloff, 2007).

No potential breeding ponds were observed within the project area. There are few CNDDB records for California tiger salamander within the immediate project vicinity. The closest CNDDB records are from a stock pond located approximately 1 mile south of the Ryan Ranch–Bishop Interconnection Improvements site and 2 miles northwest of the Main System–Hidden Hills Interconnection Improvements site; and from a seasonal swale surrounded by annual grassland and strawberry fields located 1.5 miles northeast of the Castroville Pipeline alignment northern terminus where 33 California tiger salamander larva were captured in 2006 (CDFW, 2016). California tiger salamander larvae have also been documented at a vernal pool located approximately 1 mile northeast of the Ryan Ranch–Bishop Interconnection Improvements site (CDFW, 2016). A known breeding site is also located approximately 1.2 miles northeast of the Ryan Ranch-Bishop Interconnection Improvements site (Fort Ord Reuse Authority, 2012). This species has also been observed approximately 2 miles east of the proposed ASR facilities.

This species would have low potential to occur along the new Transmission Main Pipeline alignment as there are no recent observations in the vicinity of this alignment and this area is highly urbanized.

The MPWSP Desalination Plant site has previously been regularly mowed or disked; however, it currently provides non-native grassland with significant cover from ruderal species. The site is located within 250 feet of a drainage ditch connected to the Salinas River and a retention basin to the northeast of the site. There is some potential that California tiger salamander could occur in this drainage ditch or retention basin and, if present, could utilize grassland at the MPWSP Desalination Plant as upland habitat.

Non-native grassland within the north portion of the proposed new Desalinated Water Pipeline and Source Water Pipeline alignments is located within 1.2 miles of the drainage ditch connected to the Salinas River. Additionally, a potential breeding pond surrounded by grassland and agricultural fields is located in Armstrong Ranch within 1.2 miles east of the new Desalinated Water Pipeline Alignment. The area surrounding the pond has recently been converted to agricultural, which could limit dispersal from the pond to the pipeline alignment. If present within the ditch and/or pond, California tiger salamander could disperse to grassland within the northern portion of the alignments and use these areas as upland habitat. This species would not be expected to occur at the pond at Locke-Paddon Park as the pond is isolated by development. Grassland located within the Pipeline to CSIP Pond and Brine Discharge Pipeline alignments and the Brine Mixing Box construction footprint are also located within 1.2 miles of the drainage ditch connected to the Salinas River and retention basin and California tiger salamander could utilize these areas as upland habitat.

With the exception of grassland located at Charles Benson Road and Del Monte Boulevard, the Castroville Pipeline is surrounded by agricultural or developed areas which provide marginal dispersal habitat for California tiger salamander. Agricultural drainage ditches along the alignment are regularly maintained, sparsely vegetated, shallow and unlikely to support breeding California tiger salamander. One pond located just over 1.2 miles northwest of the alignment among agricultural fields has potential to support breeding California tiger salamander; however, CNDDB has no records of species occurrence at these locations (CDFW, 2016). A swale is located approximately 1.2 miles northeast of the Castroville Pipeline terminus. If California tiger salamanders are present in this swale, they could potentially disperse into the project area. Agricultural fields and the City of Castroville which occur between the Castroville Pipeline alignment and the swale provide low quality dispersal habitat unlikely to be used as upland habitat by California tiger salamander.

The grassland adjacent to Charles Benson Road is separated from the Armstrong Ranch grasslands to the south; however, California tiger salamander could disperse into this area from the drainage ditch connected to the Salinas River and use this grassland as upland habitat.

According to mapping of potential California tiger salamander breeding and upland habitat conducted within the former Fort Ord (Fort Ord Reuse Authority, 2012), there are no potential breeding ponds located within 1.2 miles of the ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, or ASR Pump-to-Waste Pipeline, so this species would not be expected to occur at these sites.

California tiger salamander has been observed within 1.2 miles of the Ryan Ranch-Bishop Interconnection Improvements site. There are also ponds located within 1.2 miles of the Main System-Hidden Hills Interconnection Improvements site that could support California tiger salamander. The majority of the Ryan Ranch-Bishop Interconnection Improvements and Main System-Hidden Hills Interconnection Improvements sites are paved and would not support this species. However, California tiger salamander could occur in the approximately 0.7-acre grassland area located within the proposed Ryan Ranch-Bishop Interconnection Improvements site and grassland or coast live oak woodland adjacent to both of these Interconnection Improvements sites.

The Carmel Valley Pump Station site consists of non-native grassland with coast live oak woodland fringe south of Carmel Valley Road and surrounded by residential development. California tiger salamander are not expected at this site. There are no CNDDB occurrence records for this species in the vicinity of the Carmel Valley Pump Station site and, from aerial photographs, suitable potential breeding habitat does not appear within 1.2 miles of the site.

California red-legged frog (*Rana draytonii*). California red-legged frog is federally listed as threatened and considered a California species of special concern. This species is principally a pond frog that can be found in quiet permanent waters of ponds, pools, streams, rivers, springs, marshes, and lakes. Moist woodlands, forest clearings, and grasslands also provide suitable habitat for this species in the non-breeding season. Adult frogs seek waters with dense shoreline vegetation, such as cattails (*Typha angustifolia, T. latifolia*), which provide good cover, but may also be found in unvegetated waters. California red-legged frogs breed from January to May. Eggs are attached to vegetation in shallow water and are deposited in irregular clusters. Tadpoles grow up to 3 inches in size before metamorphosing. California red-legged frogs are active year-round along the coast but inland populations may aestivate from late summer to early winter. Adults consume insects such as beetles, caterpillars, and isopods, while tadpoles forage on algae and detritus. Depending on environmental conditions, California red-legged frogs may frequently travel distances greater than 1.2 miles from breeding ponds, and some adults have been documented to travel more than 2 miles (USFWS, 2002). Typical dispersal distances are less than 0.3 mile, with few individuals dispersing up to 1.2 to 1.8 miles (Fellers, 2005). Dispersal habitat is defined in the Federal Register's designation of critical habitat for the California red-legged frog by the USFWS as "upland or riparian habitat within and between occupied or previously occupied sites located within 1 mile of each other (USFWS, 2010b)."

Potential California red-legged frog breeding habitat was not observed within the project boundary during reconnaissance surveys conducted for the proposed project. There are few California red-legged frog CNDDB occurrence records in the immediate project vicinity (CDFW, 2016). Most CNDDB records are limited to the Carmel River with one record from the Salinas River approximately 0.75 mile east of the proposed MPWSP Desalination Plant site (CDFW, 2016). There are some historical observations from 1856, 1891, and 1942 from the Pacific Grove and downtown Monterey area (AmphibiaWeb, 2016). It is unlikely that California red-legged frogs still occur in this area due to years of development and isolation from recent occurrence records. This frog is known to breed along the Carmel River and adults have been observed in artificially-maintained ponds at the Tehama Golf Course, which is located approximately 1.2 miles south of the Ryan Ranch-Bishop Interconnection Improvements and 2.1 miles west of the Main System-Hidden Hills Interconnection Improvements site (CDFW, 2016).

This species would have low potential to occur at the new Transmission Main as there are no recent observations in the vicinity and this area is highly urbanized.

The MPWSP Desalination Plant has previously been regularly mowed or disked; however, it currently supports non-native grassland with ruderal species cover. The site is located within 675 feet of the Salinas River, and 250 feet of a drainage ditch connected to the Salinas River and retention pond. Since the frog is known from the Salinas River, this species could potentially disperse through MPWSP Desalination Plant site and use non-native grassland as upland habitat.

Non-native grassland within the north portion of the proposed new Desalinated Water Pipeline and Source Water Pipeline is located within one mile of the Salinas River. Additionally, a pond surrounded by grassland and agricultural fields is located in Armstrong Ranch within 1.2 miles east of the new Desalinated Water Pipeline Alignment. The area surrounding the pond has recently been converted to agricultural, which could limit dispersal from the pond to the pipeline alignment. If present within the Salinas River and/or pond, California red-legged frog could disperse to grassland within the northern portion of the alignments and use these areas as upland habitat. This species would not be expected to occur at the pond at Locke-Paddon park as it is surrounded by development and likely contains predatory fish. Non-native grassland located within the Pipeline to CSIP Pond, Brine Discharge Pipeline, and Brine Mixing Box project area boundaries also is located within 1 mile of the Salinas River and California red-legged frog could disperse through these areas as well.

The Castroville Pipeline is surrounded by agricultural or developed areas which provide marginal upland habitat for California red-legged frog. Agricultural drainage ditches along the alignment are regularly maintained, sparsely vegetated, shallow and unlikely to support breeding California red-legged frog. The Salinas River, Tembladero Slough, and the freshwater marsh and riparian woodland and scrub north of Tembladero Slough provide potential aquatic habitat for California red-legged frog. Additionally, same as the Source Water Pipeline and new Desalinated Water Pipeline, potential breeding ponds are located within 1.2 miles of the non-native grassland located north of the 0.8-mile-long pipeline segment along Charles Benson Road. California tiger salamander and California red-legged frog could utilize these grasslands as upland habitat.

According to mapping of potential California red-legged frog breeding and upland habitat conducted within the former Fort Ord (Fort Ord Reuse Authority, 2012), there are no potential breeding ponds located within one mile of the ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, or ASR Recirculation Pipeline, so this species is not be expected to occur at these sites.

California red-legged frog has been observed within one mile of both the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites, and there are several drainages between the recorded sightings and these project improvements. Although most of the project area associated with the Ryan Ranch-Bishop Interconnection Improvements and Main System-Hidden Hills Interconnection Improvements are paved, California red-legged frog could occur in the approximately 0.7-acre grassland area located within the proposed Ryan Ranch-Bishop Interconnection Improvements site and grassland or oak woodland that occurs adjacent to both of these sites.

The Carmel Valley Pump Station site consists of non-native grassland with coast live oak woodland fringe south of Carmel Valley Road and surrounded by residential development. The site is located on a lot adjacent to the Carmel River where CNDDB documents a breeding population of California red-legged frog between 1993 and 2003 (CDFW, 2016). However, groundwater pumping of the Carmel River in this area is reported to leave smaller tributaries and backwater pools dry and would influence use of this area for breeding on an annual basis (CDFW, 2016). California red-legged frog could use the Carmel Valley Pump Station site as upland refugia or during dispersal.

Birds

Western Snowy Plover (*Charadrius alexandrinus nivosus*). The western snowy plover is federally listed as threatened and considered a California species of special concern. It breeds primarily on coastal beaches from southern Washington to southern Baja California. The species breeds above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely-vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries. Less common nesting habitat includes bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and river bars. Snowy plover use areas with wide, sandy, dune-backed beaches for roosting and foraging during the nonbreeding season. This species forages above and below the mean high waterline, typically gathering food from the surface of the sand, wrack line, or low foredune vegetation.

Western snowy plover are known to nest in the beach and sand dunes between Reservation Road and the Salinas River National Wildlife Refuge, known as the Marina subregion (Page et al., 2017). In this subregion, 34 nests were observed in 2016 and 65 nests were found in 2015 (Page et al., 2016). In 2016 there were 427 individual snowy plovers in the Monterey Bay breeding population (Page et al., 2017). During surveys conducted for the MPWSP in 2012 (ESA, 2012) and 2013 (ESA, 2013), western snowy plovers were observed at the beach located north and south of the CEMEX sand mining facility, respectively. Multiple western snowy plover nests have been observed on the beach and foredunes within and at the proposed northernmost subsurface slant well cluster in the CEMEX active mining area (PRBO, 2012 in Zander Associates, 2013). This species has also historically nested in the backdunes of the CEMEX active mining facility where the subsurface slant wells are proposed (Neuman, 2015). Several western snowy plovers were observed among the sparse central dune scrub and iceplant mats of the CEMEX active mining facility during reconnaissance surveys in May 2016 (ESA, 2016). Western snowy plover has a high potential to nest along the beach and foredunes in the vicinity of the northernmost subsurface slant well cluster at the western terminus of the proposed Source Water Pipeline alignment. Additionally, western snowy plover may use the beach and dunes within all subsurface slant well and Source Water Pipeline work areas for wintering, roosting, and foraging. Western snowy plover has potential to nest in the backdunes in the proposed subsurface slant well area.

Other Special-Status Species

Plants

Hickman's onion (*Allium hickmanii*). Hickman's onion is a CRPR 1B.2 taxon. It is a perennial, bulbiferous herb in the onion family (Alliaceae) that blooms during April and May. This species is most often associated with shallow, sandy, or otherwise unproductive soils, such as shale and clay hardpan. Hickman's onion is associated with a variety of plant species; most populations are associated with grassland species, but some occur at the grassland/chaparral ecotone or within open oak woodland areas. Plants favor slightly mesic microhabitats within these communities. Coastal influence, and the supplemental moisture associated with summer fog, may be the most important variable affecting population distributions. Remnant patches of coastal prairie typically receive summer fog and are particularly likely to support Hickman's onion. This species has been documented in a moist drainage area over hardpan near the proposed Ryan Ranch–Bishop Interconnection Improvements (CDFW, 2016). This species has not been observed during project-related botanical surveys, but has potential to occur in grassland or grassland understory of coast live oak woodlands alongside the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites.

Hooker's manzanita (*Arctostaphylos hookeri* ssp. *hookeri*). Hooker's manzanita is a CRPR 1B.2 taxon. One of several rare manzanita species endemic to the Monterey Bay region, Hooker's manzanita (heath family [Ericaceae]) is associated with sandy shale soils and sandstone outcrops.

It is an uncommon component of the maritime chaparral community, and is differentiated from other local manzanitas by its short, low-growing stature and shiny green leaves. The distribution of this subspecies extends from the hills east of Watsonville to Carmel; other rare subspecies of *A. hookeri* occupy coastal habitat to the north and south. It is found in chaparral, coastal prairie, coastal scrub, and valley and foothill grassland communities. This species has been documented within maritime chaparral near the Ryan Ranch-Bishop Interconnection site (CDFW, 2016; USACE, 1997). During botanical surveys of the project area in 2016, Hooker's manzanita was observed in central dune scrub bordering the new Transmission Main Pipeline alignment along General Jim Moore Boulevard at Normandy Road (AECOM, 2016). This species has a potential to occur in maritime chaparral and northern coastal scrub (California sagebrush scrub alliance) communities near the Main System-Hidden Hills Interconnection Improvements site and along the east side of General Jim Moore Boulevard in the vicinity of the proposed ASR facilities, and in central dune scrub at the subsurface slant well site and along the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main Pipeline, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to Waste Pipeline alignments.

Toro manzanita (*Arctostaphylos montereyensis*). Toto manzanita is a CRPR 1B.2 taxon. The species is identified by its short-haired glandular appearance and relatively long petioles. Toro manzanita is found in chaparral, woodland, and coastal scrub communities. Occurrence records for this species are located in maritime chaparral in the vicinity of both the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites, near the Monterey Regional Airport, and on the former Fort Ord military base (CDFW, 2016). It may occur in coast live oak woodland, maritime chaparral, or northern coastal scrub (California sagebrush scrub alliance) in the vicinity of the Ryan Ranch-Bishop Interconnection Improvements site; Main System-Hidden Hills Interconnection Improvements site; along the east side of General Jim Moore Boulevard in the vicinity of the proposed ASR-5 and ASR-6 Wells and the three proposed ASR pipelines; and along the proposed new Transmission Main.

Pajaro manzanita (*Arctostaphylos pajaroensis*). Pajaro manzanita is a CRPR 1B.1 taxon. This species is an important component of maritime chaparral in the upper watershed of Elkhorn Slough and occurs with less frequency in the Marina and Seaside areas. It can also occur along the edges of oak woodland. Pajaro manzanita is readily distinguishable by its clasping, square-based leaves and mint green color. This species has been observed in the former Fort Ord military base near the intersection of General Jim Moore Boulevard and Broadway Avenue and near the intersection of Lightfighter Drive and Highway 1 near the northern entrance to the former Fort Ord military base (CDFW, 2016). This species has potential to occur in maritime chaparral, northern coastal scrub or coast live oak woodland communities along the new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments; at both the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites; and at the ASR-5 and ASR-6 Well sites.

Sandmat manzanita (*Arctostaphylos pumila*). Sandmat manzanita is a CRPR 1B.2 taxon. It is a low-growing mounded shrub found in sand dunes. The leaves of sandmat manzanita are smaller than other locally occurring manzanitas. The bark is red and shredded. Sandmat manzanita is an important component of maritime chaparral in the former Fort Ord military base and is documented in the vicinity of General Jim Moore Boulevard, in coastal areas from Marina to Seaside, and near the Presidio of Monterey and the Monterey Airport (CDFW, 2016). During reconnaissance-level surveys conducted for this EIR/EIS, this species was observed in central dune scrub at multiple locations along the proposed new Transmission Main alignment between Marina and Lightfighter Drive (ESA, 2016). Two individuals were also observed along Lapis Road near the proposed new Desalinated Water Pipeline alignment during project related botanical surveys conducted in 2012 (ESA, 2012). This species has potential to occur within central dune scrub and central maritime chaparral within the subsurface slant wells site, along the Source Water Pipeline alignment, along the new Desalinated Water Pipeline alignment, in the vicinity of the Main System-Hidden Hills Interconnection Improvements, and at the ASR-5 and ASR-6 Wells sites, along the ASR Conveyance Pipeline, ASR Recirculation Pipeline, and the ASR Pump-to-Waste Pipeline alignments.

Ocean bluff milkvetch (*Astragalus nuttallii* var. *nuttallii*). Ocean bluff milkvetch is a CRPR 4.2 taxon. It is a perennial herb of the pea family, endemic to the central coast of California where it grows in sandy soils and forms a thick, low clump of hairy stems and leaves. Flowers are dull cream-colored to violet and fruit is an inflated legume pod up to 6 centimeters in length containing many seeds in a single chamber. Observed during focused botanical surveys of the CEMEX active mining facility conducted in 2015 (AECOM, 2016). May occur in central dune scrub throughout the project area at the subsurface slant wells site, along the Source Water Pipeline alignment, along the new Desalinated Water Pipeline alignment, the ASR-5 and ASR-6 Wells sites, along the ASR Conveyance Pipeline, ASR Recirculation Pipeline, and the ASR Pump-to-Waste Pipeline alignments.

Monterey coast paintbrush (*Castilleja latifolia*). Monterey Coast paintbrush is a CRPR 4.3 taxon. It is a hemiparasitic perennial herb in the broomrape family (Orobanchaceae) that typically blooms between February and September. It grows in sandy soils in closed-cone coniferous forest, coastal dunes, coastal scrub, and openings in cismontane woodland. Monterey Coast paintbrush has been observed in central dune scrub during reconnaissance surveys of the new Transmission Main Pipeline alignment between Reservation Road and Lightfighter Drive and at the CEMEX active mining facility (ESA, 2016; AECOM, 2016). Monterey Coast paintbrush has potential to occur in central dune scrub, central maritime chaparral, and coast live oak woodland at the subsurface slant well site, along the Source Water Pipeline, new Desalinated Water Pipeline, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments, and at the ASR-5 and ASR-6 Wells.

Monterey ceanothus (*Ceanothus rigidus*). Monterey ceanothus is a CRPR 4.2 taxon. It is a perennial evergreen shrub in the buckthorn family (Rhamnaceae) that typically blooms between February and June. This species is found in closed-cone coniferous forest, chaparral, and coastal scrub areas with sandy soils. It is found in Monterey, Santa Cruz, and San Luis Obispo Counties. It was also observed within the new Transmission Main alignment and adjacent to the ASR Conveyance, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments in 2014 during surveys conducted for the proposed project (URS, 2014b). Monterey ceanothus has potential to occur within central dune scrub and central maritime chaparral at the proposed subsurface slant wells site, along the Source Water Pipeline, new Desalinated Water Pipeline, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments, and at the ASR-5 and ASR-6 Wells.

Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*). Congdon's tarplant is a CRPR 1B.1 taxon. This spiny, resinous, annual herb in the sunflower family (Asteraceae) occurs in grassland, particularly in areas with alkaline substrates, and in depressions or disturbed areas where water collects. The blooming period extends from June through November. The range of this species includes Alameda, Contra Costa, Monterey, Santa Clara, San Luis Obispo, and San Mateo counties. Congdon's tarplant has been observed in grassland and drainage ditches in the vicinity of Highway 68 east and northeast of both the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements. It has also been observed in mesic grassland areas at the Moss Landing Power Plant (CDFW, 2016). This species often occurs in disturbed areas and has potential to occur in slightly mesic, alkaline grassland and ruderal areas in the vicinity of the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements and at the MPWSP Desalination Plant site.

Branching beach aster (*Corethrogyne filaginifolia* [formerly *C. leucophylla*]). Branching beach aster is a CRPR 3.2 taxon. It is a perennial herb in the sunflower family. This species typically blooms between May and December and typically occurs in closed-cone coniferous forest and coastal dune and dune scrub habitat in sandy soils between taller shrub cover. It was frequently observed within the Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, and new Transmission Main alignments during surveys conducted for the proposed project (URS, 2014b; ESA, 2016).

Eastwood's goldenbush (*Ericameria fasciculata*). Eastwood's goldenbush is a CRPR 1B.1 taxon. It is a perennial yellow-flowering shrub in the sunflower family that blooms from July through October. This species occurs in sandy soils in openings in closed-cone coniferous forest, maritime chaparral, coastal dunes, and coastal scrub communities. Eastwood's goldenbush has been observed on the former Fort Ord military base in the vicinity of General Jim Moore Boulevard and between Patton Parkway and Imjin Road east of Highway 1 (CDFW, 2016). It has potential to occur in central dune scrub, maritime chaparral, and coastal sage scrub communities at the subsurface slant well site, along the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments, in the vicinity of the Main System-Hidden Hills Interconnection Improvements, and at the ASR-5 Well and ASR-6 Well sites.

Sand-loving wallflower (*Erysimum ammophilum*). Sand-loving wallflower is a CRPR 1B.2 taxon. It is an annual yellow-flowered herb in the mustard family (Brassicaceae) that blooms February through June. This species is another rare associate of the maritime chaparral community, growing on loose sandy soils of coastal and inland dunes. Populations of sand-loving wallflower are documented within Marina State Beach, Fort Ord Dunes State Park, on former Fort Ord lands in the vicinity of Marina, on the former Fort Ord military base in the vicinity of General Jim Moore Boulevard, and in disturbed dunes north of the CEMEX sand mining facility (CDFW, 2016). Individuals of this species were observed in coastal dunes north of the CEMEX sand mining facility during project related botanical surveys conducted in 2012 (ESA, 2012).

Additionally this species was observed in 2014 and 2016 during surveys conducted for the proposed project at the subsurface slant well site within central dune scrub at the CEMEX active mining facility (ESA, 2014; 2016). Sand-loving wallflower was also documented in central dune scrub along the new Transmission Main Pipeline between Patton Parkway and Imjin Parkway (AECOM, 2016). This species has potential to occur in central dune scrub and maritime chaparral along the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments, and at the ASR-5 Well and ASR-6 Well sites.

Kellogg's horkelia (*Horkelia cuneata* ssp. *sericea*). Kellogg's horkelia is a CRPR 1B.1 taxon. A spreading perennial herb in the rose family (Rosaceae), Kellogg's horkelia is associated with relict dunes and old marine terraces from San Mateo County south to Santa Barbara County. Relatively recent (within the last 30 to 40 years) CNDDB occurrence records have documented this species within the former Fort Ord military base east of General Jim Moore Boulevard within the development water infiltration area that will be used during development of the ASR-5 Well and ASR-6 Well, north of the Ryan Ranch-Bishop Interconnection Improvements site, and north of Imjin Parkway east of Highway 1 (CDFW, 2016). This species was observed along Del Monte Boulevard along the new Desalinated Water Pipeline alignment during project related botanical surveys conducted in 2012 and 2016 (ESA, 2012; 2016). Kellogg' horkelia has potential to occur in central dune scrub and maritime chaparral at the subsurface slant well site, and along the Source Water Pipeline alignment.

Carmel Valley bush-mallow (*Malacothamnus palmeri* var. *involucratus*). Carmel Valley bush-mallow is a CRPR 1B.2 taxon. It is a shrub in the mallow family (Malvaceae), and is a fire-dependent species found on talus hilltops and slopes in chaparral, woodland, and coastal scrub communities. This variety is endemic to Monterey and San Luis Obispo Counties. In the vicinity of the project area, more recent observations have been documented in the vicinity of the Main System-Hidden Hills Interconnection Improvements and Ryan Ranch–Bishop Interconnection Improvements (CDFW, 2016). In 2002, Carmel Valley bush-mallow was observed approximately 0.2 mile southwest of the Main System–Hidden Hills Interconnection Improvements and in 2003 it was observed in coast live oak forest approximately 300 feet south of the Ryan Ranch–Bishop Interconnection Improvements (CDFW, 2016). Carmel Valley bush-mallow has potential to occur in central dune scrub, central maritime chaparral, northern coastal scrub, coast live oak woodland, and non-native grassland communities along the ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments, in the vicinity of the Main System-Hidden Hills Interconnection Improvements and Ryan Ranch–Bishop Interconnection Improvements, and at the ASR-5 Well and ASR-6 Well sites.

Marsh microseris (*Microseris paludosa*). Marsh microseris is a CRPR 1B.2 taxon. It is a perennial herb in the sunflower family that typically blooms between April and June, and uncommonly through July. It occurs in vernally wet areas within closed-cone coniferous forest, woodland, coastal scrub, and valley and foothill grasslands. It is found in the San Francisco Bay Area and along the central California coast. There are other historical records from the Del Monte Forest area. The most recent CNDDB observations of this species in the vicinity of the project area is from a 1997 observation located approximately 1.5 miles southwest of the Ryan Ranch–

Bishop Interconnection Improvements (CDFW, 2016). This species has potential to occur within seasonally wet areas in the vicinity of both the Ryan Ranch–Bishop and Main System-Hidden Hills Interconnection Improvements sites.

Northern curly-leaved monardella (*Monardella sinuata* ssp. *nigrescens*). Northern curly-leaved monardella is a CRPR 1B.2 taxon. It is an annual herb in the mint family (Lamiaceae), found in chaparral, coastal dunes, coastal scrub, and lower montane coniferous forest. Northern curly-leaved monardella typically blooms between April and September. This species has been observed in suitable habitat at several locations within the project vicinity (CDFW, 2016). The most recent observation was in the vicinity of the Monterey Regional Airport. This species has potential to occur within central dune scrub, central maritime chaparral, and northern coastal scrub communities at the subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline.

South coast branching phacelia (*Phacelia ramosissima* var. *austrolitoralis*). South coast branching phacelia is a CRPR 3.2 taxon. It is a perennial herb in the forget-me-not family (Boraginaceae), found in chaparral, coastal dunes, coastal scrub, and coastal sandy (sometimes rocky) marshes and swamps. South coast phacelia typically blooms between March and August. South coast branching phacelia has potential to occur in central dune scrub, central maritime chaparral, and northern coastal scrub communities at the subsurface slant wells site, within the Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, new Transmission Main, and Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline).

Monterey pine (*Pinus radiata*). Monterey pine is a CRPR 1B.1 taxon. It is a perennial evergreen tree in the pine family (Pinaceae). There are only three native stands in California: at Ano Nuevo, in Cambria, and on the Monterey Peninsula. This species has been widely introduced and used in landscaping in many other locations; however, Monterey pine trees planted in urban or streetscape locations typically are not considered special-status. The CNDDB reports two occurrences of this species in the vicinity of the project area. The occurrence records include the entire assumed historical range, which encompass much of the Monterey Peninsula and portions of the project area. In practice, individual or isolated trees that exist only in a landscaping context are not considered sensitive. However, the *Biological Assessment for the Monterey Bay Regional Desalination Project Monterey Presidio Project* concludes that Monterey pines within the Monterey Bay Regional Desalination Project Monterey Presidio Project area are considered special-status because they occur within the historic range of the species (Denise Duffy & Associates, 2010). On a case-by-case basis, any Monterey pines present at the Carmel Valley Pump Station, and both Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements sites may be considered special-status if they are within, or in close proximity to, the assumed historical range reported by the CNDDB.

Michael's rein orchid (*Piperia michaelii*). Michael's rein orchid is a CRPR 4.2 taxon. It is a perennial herb in the orchid family that typically blooms between April and August. It is found in coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, and lower mountain coniferous forest. Michael's rein orchid was observed in several locations within the new Transmission Main pipeline alignment between Patton Parkway and Lightfighter Drive and along General Jim Moore Boulevard near San Pablo Avenue during protocol level plant surveys conducted for the proposed project in 2014 (AECOM, 2016). This species has potential to occur in central dune scrub and central maritime chaparral at the subsurface slant wells site, within the Source Water Pipeline, new Desalinated Water Pipeline, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments, at the ASR-5 Well and ASR-6 Well, and in woodlands in the vicinity of the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites.

Santa Cruz microseris (*Stebbinsoseris decipiens*). Santa Cruz microseris is a CRPR 4.2 taxon. It is an annual herb in the sunflower family, found in open areas, sometimes in serpentine soils, in broadleaf upland forest, chaparral, coastal prairie and scrub, and valley and foothill grassland communities. It occurs in Monterey, Santa Cruz, and Marin Counties. Santa Cruz microseris typically blooms in April and May. One CNDDB occurrence record for this species is located in the vicinity of the project area; in 1978 one plant was observed at the top of a roadcut outside of pasture just northeast of the Ryan Ranch–Bishop Interconnection Improvements (CDFW, 2016). This species has a potential to occur in coast live oak or grassland in the vicinity of both the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites.

Santa Cruz clover (*Trifolium buckwestiorum*). Santa Cruz clover is a CRPR 1B.1 taxon. It is an annual herb in the legume family that blooms April through October. It is typically found on margins of broadleaved upland forest, woodland, and coastal prairie. Its range includes Mendocino, Sonoma, San Mateo, Santa Cruz, and Monterey Counties. There are two CNDDB records for this species in the vicinity of the project area, both of which are from 1993 and are located near both the Ryan Ranch-Bishop Interconnection Improvements and Main System-Hidden Hills Interconnection Improvements sites (CDFW, 2016). This species has potential to occur within coast live oak woodland or non-native grassland in and around these two sites.

Invertebrates

Globose dune beetle (*Coelus globosus*). The globose dune beetle is considered sensitive under the City of Marina's LCLUP. This species inhabits foredunes and sand hummocks where it forages leaves, twigs, seeds, and plant detritus above and below the surface, generally preferring native dune plants to non-native species with the exception of sea rocket (*Cakile maritima*). Its range extends from Bodega Bay Head to Ensenada, Baja California, and the Channel Islands (with the exception of San Clemente). This species has been observed along the coastal portion of Monterey Bay including the sand dunes in Seaside and at the Salinas River State Beach (CDFW, 2016). This species has potential to occur within central dune scrub at the proposed subsurface slant well site and in the western portion of the Source Water Pipeline.

Reptiles

Western pond turtle (*Actinemys marmorata*). The western pond turtle is considered a California species of special concern. It is an aquatic turtle that usually leaves the aquatic site to reproduce, to aestivate, and to overwinter. This turtle requires some slack or slow water, although it occurs where enough food resources occur in faster moving water. Western pond turtle usually nest in hard-packed clay soil in upland areas from March to July. Hatchlings disperse from the nest with winter rains. Western pond turtles have been observed within the Carmel River, at a brackish water pond near the intersection of Beach Road and Reservation Road approximately 0.2 mile west of the proposed new Transmission Main Pipeline alignment (CDFW, 2016). This species has potential to occur within suitable aquatic habitat throughout the project area including Locke-Paddon Pond in Marina, Laguna del Rey Park in Monterey, the Salinas River, Tembladero Slough and freshwater marsh and riparian woodland and scrub north of Tembladero Slough.

Black legless lizard (*Anniella pulchra nigra*). Black legless lizard is considered a California species of special concern. They are found in sand dunes and sandy soils along the Monterey Bay. Black legless lizard typically inhabit dune areas with moist soil and bush lupine and mock heather as the dominant plants. They are fossorial animals that burrow in loose soil with a high sand content. This subspecies is typically black or dark brown above and yellow below. Some groups only recognize the species, California legless lizard (*Anniella pulchra*), and do not recognize this or other subspecies (i.e. silvery legless lizard described below). The specific CNDDB record locations for this species are suppressed by CDFW, but this species is known from sand dune communities, including both native and non-native plant dominant areas, at locations within the Marina, Seaside, Monterey, Moss Landing, and Watsonville West USGS 7.5 minute topographic quadrangles (CDFW, 2016). This species has potential to occur within central dune scrub, northern coastal scrub, and central maritime chaparral at the proposed subsurface slant well site; along the Source Water Pipeline, new Desalinated Water Pipeline, southwest portion of the Castroville Pipeline, new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments; and at the ASR-5 Well and ASR-6 Well sites.

Silvery legless lizard (*Anniella pulchra pulchra*). Silvery legless lizard is considered a California species of special concern. They are found in vegetation communities within sandy or loose loamy soils and sparse vegetation. Their range includes the coast and central valley of California from the southern San Francisco Bay Area to Baja California. This subspecies is silvery gray, or beige above and yellow below. As with the black legless lizard, some groups only recognize the species, California legless lizard, and do not recognize this or other subspecies. There is one CNDDB record for this subspecies in the vicinity of the project area; two individuals were observed in maritime chaparral near Reservation Road approximately 0.5 mile east of the project area (CDFW, 2016). The next closest CNDDB record is from sand dunes at Moss Landing approximately 5 miles northwest of the project area. Similar to the black legless lizard, this subspecies has potential to occur within central dune scrub, northern coastal scrub, and central maritime chaparral communities at the proposed subsurface slant well site; along the Source Water Pipeline, new Desalinated Water Pipeline, southwest portion of the Castroville Pipeline, new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments; and at the ASR-5 Well and ASR-6 Well sites.

Coast horned lizard (*Phrynosoma blainvillii*). Coast horned lizard is considered a California species of special concern. They occupy loose sandy loam and alkaline soils in a variety of vegetation communities including chaparral, grasslands, saltbush scrub, coastal scrub, and clearings in riparian woodlands. Coast horned lizards primarily eat insects such as ants and beetles. Their population decline is mainly attributed to conversion of land for agricultural purposes. The human introduction of non-native Argentine ants, which tend to displace the native carpenter ants and do not provide enough nutrition for coast horned lizard, is another factor in their decline. Within the vicinity of the project area, coast horned lizards have been observed in grazed annual grasslands and coastal dune scrub north of Beach Road along the proposed new Desalinated Water Pipeline alignment (CDFW, 2016). Additionally, coast horned lizards have been observed at several locations approximately 1.5 miles east of the new Transmission Main alignment (CDFW, 2016). This species has potential to occur in sandy soils within grassland, central dune scrub, central maritime chaparral, and northern coastal scrub at the proposed subsurface slant well site; along the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments; and at the ASR-5 Well and ASR-6 Well sites.

Coast Range newt (*Taricha torosa*). Coast Range newt is considered a California species of special concern. Adult Coast Range newt habitat within central California includes grassland and woodland habitats. They breed in ponds, reservoirs and streams. Newts aestivate in terrestrial habitat during the dry summer and can migrate large distances between breeding and aestivation sites, however they may not migrate great distances if suitable aestivations sites are close to breeding sites. Coast Range newts have been observed in and around stock ponds located south of the Carmel River (CDFW, 2016). This species has potential to occur in ponds and streams and in adjacent grassland and woodland habitat within the survey area including: MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, ASR Facilities, new Transmission Main, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas.

Birds

Tricolored blackbird (*Agelaius tricolor*). Tricolored blackbird is considered a California species of special concern. Tricolored blackbirds are found almost exclusively in the Central Valley and central and southern coastal areas of California. The tricolored blackbird is highly colonial and forms dense breeding colonies of up to tens of thousands of pairs. This species typically nests in tall, dense, stands of cattails or tules, but also nests in blackberry, wild rose bushes, and tall herbs. Nesting colonies are typically located near standing or flowing freshwater. Tricolored blackbirds form large, often multi-species, flocks during the nonbreeding period and range more widely during the nonbreeding period than during the reproductive season. This species has been observed at Locke-Paddon Park, less frequently at the Salinas River, northeast of the Salinas River, and at other locations in the vicinity of the survey area (CDFW, 2016; eBird, 2016). While this species may also forage in grassland and agricultural areas throughout the project area, Locke-Paddon Park and Laguna del Rey Park are the only areas in the project area that provide adequate potential nesting habitat.

Short-eared owl (*Asio flammeus*). Short-eared owl is considered a California species of special concern. This species inhabit densely vegetated grasslands, emergent wetlands, and shrublands along the coast with abundant prey (e.g., voles, other small mammals, birds, reptiles, amphibians, and arthropods). Short-eared owls require dense vegetative cover such as tall grasses and freshwater emergent vegetation for roosting and resting. Nesting occurs from April through July, with nests constructed on dry ground in depressions concealed by dense vegetation. In the project vicinity, short-eared owl has been observed at the Salinas River National Wildlife Refuge and Armstrong Ranch grasslands (eBird, 2016). This species could forage or nest in grassland, wetland, or northern coastal scrub habitat in the project area near the proposed Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, and New Transmission Pipeline alignments, and near the proposed MPWSP Desalination Plant facility.

Western burrowing owl (*Athene cunicularia*). Western burrowing owl is considered a California species of special concern. It is a small, terrestrial owl of open country that favors flat, open grassland and sparse shrubland ecosystems. In California, western burrowing owls are found in close association with California ground squirrels. Ground squirrels provide western burrowing owls with nesting and refuge burrows, and maintain areas of short vegetation height, providing foraging habitat and allowing for visual detection of avian predators by burrowing owls. Burrowing owls are semi-colonial nesters, and group size is one of the most significant factors contributing to site constancy by breeding burrowing owls. The nesting season, as recognized by the CDFW, runs from February 1 through August 31. Within the project vicinity, wintering burrowing owls have been observed within coastal dune scrub near the U.S. Navy Post Graduate School and in grazed grassland north of Beach Road on either side of the new Transmission Main Pipeline alignment (CDFW, 2016). ESA observed two burrowing owls in these grasslands between Highway 1 and Del Monte Blvd. during 2016 reconnaissance surveys (ESA, 2016). Burrowing owls were also historically observed in open valley fields on the former Fort Ord lands near Reservation Road (CDFW, 2016). No recent local breeding burrowing owl occurrence records are included in the CNDDB (CDFW, 2016). During biological surveys conducted for the proposed project numerous ground squirrels and ground squirrel burrows were observed within non-native grassland, central dune scrub, and ruderal areas (ESA, 2016). Both breeding and wintering burrowing owls have potential to occur in non-native grassland, central dune scrub, central maritime chaparral, and ruderal areas that support ground squirrel populations along the Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main Pipeline alignments.

Red-tailed hawk (*Buteo jamaicensis*). Red-tailed hawks, their nests, and their eggs are protected under California Fish and Game Code 3503.5. This species is commonly found in woodlands and open country with scattered trees. These large hawks feed primarily on small mammals, but will also prey on other small vertebrates, such as snakes and lizards, as well as small birds and invertebrates. Red-tailed hawks nest in a variety of trees in urban, woodland, and agricultural areas. This species is commonly found throughout the project vicinity (eBird, 2016). Red-tailed hawks may forage within grassland and scrub communities within the project area and could potentially nest within mature trees or suitable structures throughout the project area.

Red-shouldered hawk (*Buteo lineatus*). Red-shouldered hawks, their nests, and their eggs are protected under California Fish and Game Code 3503.5. This species is another common raptor species typically found in a variety of woodlands with nearby open areas for foraging. This species has a highly varied diet of small mammals, snakes, lizards, amphibians, small or young birds, and large insects. Red-shouldered hawks build large stick nests in mature trees, including riparian woodland trees and large eucalyptus groves. This species has been observed at numerous locations throughout the project vicinity, most commonly within Laguna del Rey Park and El Estero Park (eBird, 2016). Red-shoulder hawks have potential to nest within riparian woodland, eucalyptus forest, oak woodland, and large groves of ornamental trees within the project area.

Ferruginous hawk (*Buteo regalis*). The ferruginous hawk is included on CDFW's watch list. This species is primarily a bird of the Great Plains and the Rockies, and only winters in California, typically in groups. This species forages over open country including grasslands, deserts, and sagebrush scrub, where it preys on small mammals. Ferruginous hawk has been observed near Moss Landing, on Former Fort Ord Base lands, Salinas River Water Treatment Plant, and at Armstrong Ranch (eBird, 2016). In 2004, four ferruginous hawks were observed wintering in the Armstrong Ranch grasslands (CDFW, 2016). This species could winter in grassland and forage over northern coastal scrub habitat in the project area near the proposed Source Water Pipeline, new Desalinated Water Pipeline, southwest portion of the Castroville Pipeline, and New Transmission Pipeline alignments, and near the proposed MPWSP Desalination Plant facility.

Northern harrier (*Circus cyaneus*). Northern harrier, its nests, and its eggs are protected under California Fish and Game Code 3503.5. This species forages over grasslands, wet meadows, sloughs, and marshes, feeding on small mammals such as California vole, mice, birds, frogs, small reptiles, and insects. In western states, this species nests on the ground in dry uplands. Northern harrier has been observed near the mouth of the Salinas River, at Armstrong Ranch, Marina State Beach, Fort Ord Dunes State Park, and former Fort Ord base lands in the project vicinity (eBird, 2016). This species could forage over the dunes near the subsurface slantwells; forage or nest in grassland, wetland, northern coastal scrub or central maritime chaparral habitat in the project area near the proposed Source Water Pipeline, new Desalinated Water Pipeline, southwest portion of the Castroville Pipeline, and New Transmission Pipeline alignments; near the proposed MPWSP Desalination Plant facility; along the ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments; and at the ASR-5 Well and ASR-6 Well sites.

White-tailed kite (*Elanus leucurus*). White-tailed kite is a state Fully Protected species. These raptors forage for small rodents and other prey primarily in open grassy or scrubby areas. They nest in large shrubs or trees adjacent to this habitat. Kites are likely to be found foraging in a variety of vegetation communities throughout the project area such as grassland, northern coastal scrub, and central maritime chaparral. White-tailed kites have been observed throughout the project vicinity (eBird, 2016). Suitable nesting habitat in areas with low levels of human disturbance is found throughout the project area.

California horned lark (*Eremophila alpestris actia*). California horned lark is included on CDFW's watch list. California larks are a permanent resident in most of California except the Sierra during winter. This species is usually found in open habitat, such as grassland and agricultural areas, where trees and shrubs are absent and has been observed from sea level to above treeline in grasslands, deserts and alpine dwarf-scrub habitat. Horned lark uses grasses, shrubs, forbs, rocks, litter, clods of soil, and other surface irregularities for cover from predators. The California horned lark typically nests in dry grasslands and rangelands that provide low, sparse cover (e.g., grazed, mowed, or barren areas without trees and shrubs) between March and July. Foraging habitat includes open grasslands where insects and seeds are abundant. This species has been observed at the Salinas River National Wildlife Refuge, grasslands of Armstrong Ranch, and in former Fort Ord military base lands within the project vicinity (eBird, 2016). California horned lark may forage and nest in grassland near the new Desalinated Water Pipeline, Source Water Pipeline, south west portion of the Castroville Pipeline, new Transmission Main Pipeline near Lightfighter Drive, Pipeline to CSIP Pond, near the proposed MPWSP Desalination Plant facility, and near the Ryan Ranch Interconnection Improvement site.

American peregrine falcon (*Falco peregrinus*). Peregrine falcon is a federally and state delisted species and state Fully Protected. They are known throughout California and are year-around residents along the Pacific coast. The peregrine is a specialist, preying primarily on mid-sized birds in flight, such as pigeons and doves. Occasionally these birds will eat insects and bats. Although typical nesting sites for the species are tall cliffs, preferably over or near water, peregrines are also known to use urban sites, including bridges and tall buildings. Peregrine falcons have been observed at Laguna Grande Regional Park, near Armstrong Ranch, and along the coast between Marina and Monterey (eBird, 2016). A peregrine nest has been observed within the Moss Landing USGS 7.5 7.5-minute topographic quadrangle, although the exact location is suppressed by the CNDDB (CDFW, 2016). Nesting habitat is absent from the project area, but this species may hunt and perch throughout the project area.

American kestrel (*Falco sparverius*). American kestrel, its nests, and its eggs are protected under California Fish and Game Code 3503.5. This species is a relatively small member of the falcon family that preys on small birds, mammals, lizards, and insects. The kestrel is found most commonly in open areas, such as grasslands and pastures. American kestrels nest primarily in tree cavities but may also nest in buildings. American kestrels have regularly been observed at Armstrong Ranch and Laguna Grande Park and occasionally at other locations in the project vicinity (eBird, 2016). Most documented sightings occurred in the non-breeding season. This species may nest in trees or buildings located adjacent to foraging habitat, such as grassland and agricultural fields, and forage throughout these open areas.

Loggerhead shrike (*Lanius ludovicianus*). Loggerhead shrike is considered a California species of special concern. They are year-round residents in grassland and scrub communities in California, where they forage primarily on large insects, lizards, and small mammals. Shrikes generally build their nests in shrubs in fairly open areas. This species has been observed at a few locations in the project vicinity including Armstrong Ranch, Fort Ord Dunes State Park, and Ryan Ranch in Del Rey Oaks (eBird, 2016). This species has potential to forage and nest in grassland, northern coastal scrub, and coast live oak woodland communities throughout the project area.

Mammals

Pallid bat (*Antrozous pallidus*). Pallid bat is considered a California species of special concern. They are pale to light brown in color and weighing about 1 ounce, the Pacific race is one of the state's largest bats. Coastal colonies commonly roost in deep crevices in rocky outcroppings, in buildings, under bridges, and in hollow trees. Colonies can range from a few individuals to over a hundred and are non-migratory. Some female and/or young colonies (typical of the coastal subspecies) may use their day roost for their nursery as well as for winter roosting. Pallid bats typically breed from March 15 through August 15. Although crevices are important for day roosts, night roosts often include porches, garages, barns, and highway bridges. Pallid bats may travel up to several miles for water or foraging sites if roosting sites are limited. Pallid bats prefer foraging on terrestrial arthropods in dry open grasslands, vineyards, orchards, or oaks near water and rocky outcroppings or old structures. Although the occurrence of pallid bat in this part of Monterey County is not well-documented, the species could forage over a variety of communities in the project area and could potentially roost in human-made structures such as the Highway 1 overpasses or smaller bridge crossings in Castroville, Marina, Seaside, and Monterey and in trees throughout the project area.

Salinas kangaroo rat (*Dipodomys heermanni goldmani*). The Salinas kangaroo rat is considered sensitive under the City of Marina's Local Coastal Land Use Plan. Salinas kangaroo rat is a subspecies of Heerman's kangaroo rat (*Dipodomys heermanni*). These kangaroo rats occur in brushy and grassy slopes and flats and in chaparral-covered hillsides. They are known to gather seeds from a wide variety of forbs and grasses, as well as leaves and occasionally insects. Their preferred burrowing substrate is fine, deep soil, although shallow, coarse, and rocky soil also may be used. In the Monterey Bay, the range of the Salinas kangaroo rat includes the lower (northern) end of the Salinas Valley from the coast of Monterey Bay south of the mouth of the Salinas River to the vicinity of Soledad. The City of Marina's Local Coastal Land Use Plan identifies grasslands within the plan area as providing potential habitat for this subspecies. This species has potential to occur in grassland, scrub, and chaparral habitat along the new Desalinated Water Pipeline and new Transmission Main alignments and the staging area at Beach Road in the City of Marina.

Western red bat (*Lasiurus blossevillii*). Western red bat is considered a California species of special concern. In California, the western red bat is found in coastal areas south of the San Francisco Bay and in the Central Valley and surrounding foothills (Bolster, 1998). They roost in tree and shrub foliage, predominantly in edge habitats adjacent to streams and open fields. They are often associated with riparian habitats. The western red bat could occur in trees located throughout the project area, particularly those associated with riparian areas.

Monterey dusky-footed woodrat (*Neotoma fuscipes luciana).* Monterey dusky-footed woodrat is considered a California species of special concern. This species prefers hardwood forests, riparian communities, and brushlands and often forages above ground. Food includes berries, fungi, leaves, flowers, and nuts. Woodrats construct large nests of sticks. The breeding season of dusky-footed woodrat typically extends from February through November (Carraway and Verts, 1991). However, at the Hastings Reserve in the Upper Carmel Valley of Monterey County, reproduction is observed year-round, with the fewest pregnancies occurring during December and the most during February (Williams et al., 1992). During reconnaissance-level surveys conducted for the proposed project, woodrat nests were observed in riparian woodland adjacent to the Salinas River near the Highway 1 overcrossing, approximately 0.5 mile north of the project area. Woodrats could occur in oak woodland in the vicinity of both the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites. Woodrats could also occur in central maritime chaparral, northern coastal scrub, and coast live oak woodland communities along the ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments, at the ASR-5 and ASR-6 Wells sites, at the Carmel Valley Pump Station site, and the Ryan Ranch-Bishop Interconnection Improvements site, and Main System-Hidden Hills Interconnection Improvements site.

Monterey shrew (*Sorex ornatus salarius*). Monterey shrew is considered a California species of special concern. This species is found in coastal salt marshes and adjacent sand hills and riparian wetland, woodland, and upland communities in the vicinity of the Salinas River Delta. According to the *Draft Installation-Wide Multispecies Habitat Conservation Plan*, which covers the former Fort Ord military base lands (HCP), in 2005, shrews that were believed to be Monterey shrews were captured during California tiger salamander salvage surveys conducted at the East Garrison site on the eastern end of Reservation Road (Fort Ord Reuse Authority, 2012). The DNA analysis had not been completed at the time of the publication of the HCP but based on the location it is assumed that captured shrews were subspecies *salarius*. Between 2010 and 2011 shrews were also inadvertently captured during California tiger salamander surveys at the Fort Ord Natural Reserve, which is located on the east side of Del Monte Boulevard along Reservation Road. DNA analysis of these shrews was also not available at the time of publication of the HCP, however it is assumed that they are the subspecies *salarius* based on dentition and external morphology. These shrews were found in a variety of vegetation types including: shaggy bark manzanita, coastal scrub, under oak trees, sandmat manzanita, and non-native grassland. Based on the 2005 and 2010/2011 captures, Monterey shrew also potentially occur in coast live oak woodland, grasslands, northern coastal scrub, central maritime chaparral, and savanna vegetation. The HCP mapped potential habitat for the Monterey shrew. Based on that habitat mapping and onsite conditions, Monterey shrew has potential to occur along the new Transmission Main Pipeline, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments along General Jim Moore Blvd.; at the Carmel Valley Pump Station; in the vicinity of the Ryan Ranch-Bishop Interconnection Improvements and Main System-Hidden Hills Interconnection Improvements; and at the ASR-5 Well and ASR-6 Well sites.

American badger (*Taxidea taxus*). American badger is considered a California species of special concern. In North America, American badgers occur as far north as Alberta, Canada and as far south as central Mexico. In California, American badgers occur throughout the state except in humid coastal forests of northwestern California in Del Norte and Humboldt Counties. The species has been decreasing in numbers throughout California over the last century. American badgers occur in a wide variety of open, arid vegetation communities but are most commonly associated with grasslands, savannas, mountain meadows, and open areas of desert scrub. The principal habitat requirements for this species appear to be sufficient food (burrowing rodents), friable soils, and relatively open uncultivated ground. American badgers are primarily found in areas of low to moderate slope. There is a historical CNDDB occurrence record for this species from the city of Marina. More recent records indicate the species was observed in grazed grassland in the vicinity north of the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites (CDFW, 2016). This species has potential to occur in non-native grassland at the MPWSP Desalination Plant, along the Source Water Pipeline, new Desalinated Water Pipeline, Castroville and new Transmission Main alignments, ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignment and in the vicinity of the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites.

4.6.1.9 Critical Habitat

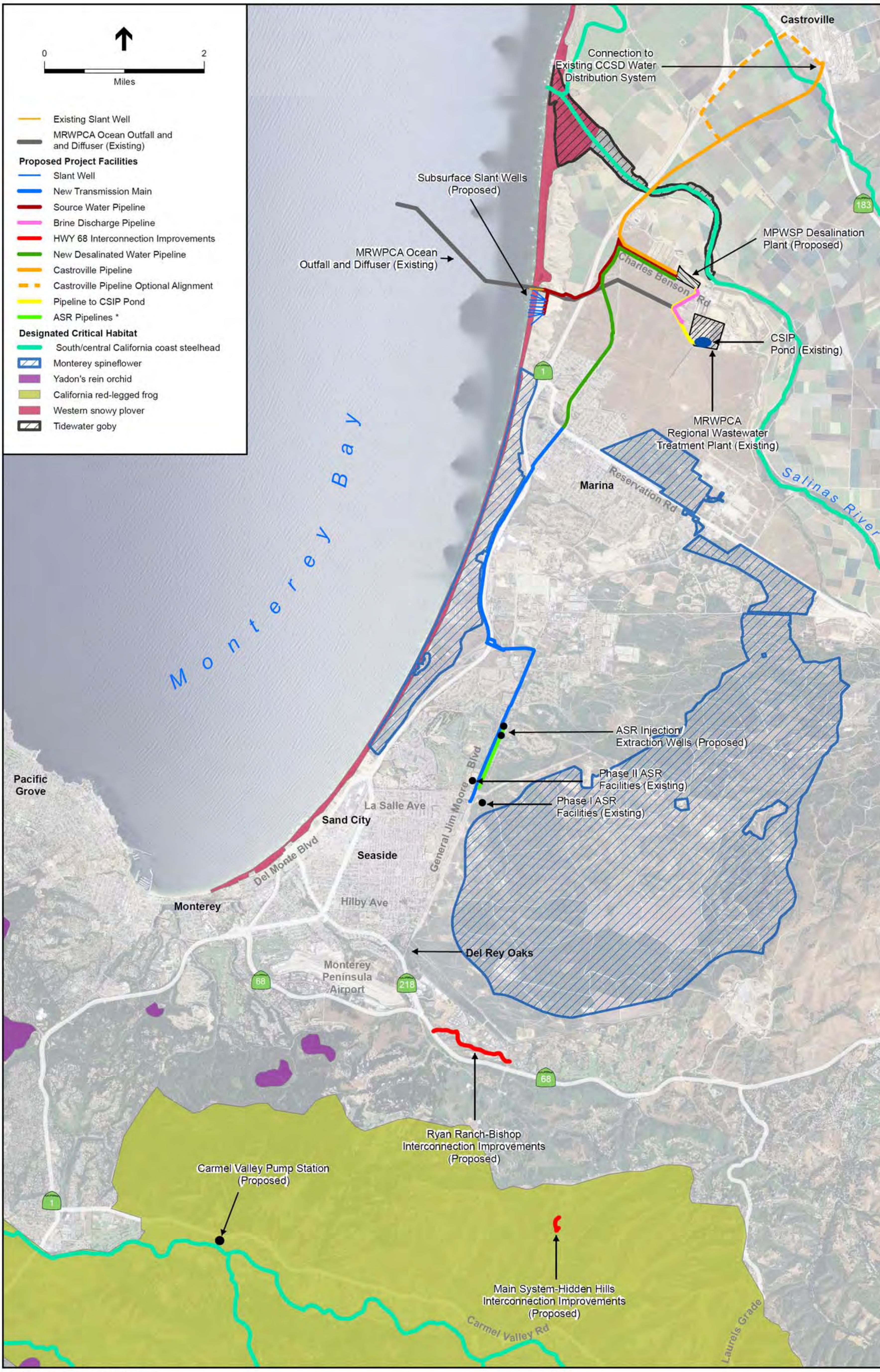
Critical habitat for six federally listed species is designated either within or in close proximity to the proposed project. The species include Monterey spineflower, Yadon's rein orchid, SCCC DPS, California red-legged frog, western snowy plover, and tidewater goby. **Figure 4.6-4** shows designated critical habitat for these species in the project vicinity.

Monterey Spineflower

Two Monterey spineflower critical habitat units occur in the project vicinity. Unit 3 (Marina) includes coastal beaches, dunes, and bluffs from the city of Marina south to the city of Seaside and Sand City and generally parallels the western side of the study area. An approximately 2-mile segment of the proposed new Transmission Main alignment is located parallel, and between 150 and 200 feet east, of the eastern boundary of Unit 3. Unit 8 (Fort Ord) includes grassland, maritime chaparral, coastal scrub, and oak woodland within the former Fort Ord military base east of General Jim Moore Boulevard. The area where water produced during development of the ASR-5 and ASR-6 wells would be conveyed lies along a portion of the western boundary of Unit 8. The Federal Register critical habitat designation notice for Monterey spineflower (73 FR 1525) defines the primary constituent element for this species as a vegetation structure arranged in a mosaic with openings between the dominant elements (e.g., scrub, shrub, oak trees, or clumps of herbaceous vegetation) that changes in spatial position as a result of physical processes such as windblown sands and fire and that allows sunlight to reach the surface of the following sandy soils: coastal beaches, dune land, Baywood sand, Ben Lomond sandy loam, Elder sandy loam, Oceano loamy sand, Arnold loamy sand, Santa Ynez fine sandy loam, Arnold-Santa Ynez complex, Metz complex, and Metz loamy sand.

Yadon's Rein Orchid

Multiple Yadon's rein orchid critical habitat units are located in the project vicinity. Units 4a and 4b (Aguajito), 5 (Old Capitol), and 6a and 6e (Monterey Peninsula) are all located within 2 miles of the study area. Units 4a and 4b are located between 1.3 and 1.9 miles southeast of the Ryan Ranch–Bishop Interconnection Improvements, respectively. Units 4a and 4b contain a mix of Monterey pine forest and maritime chaparral communities. Unit 6a supports Monterey pine forest, Gowen cypress/Bishop pine forest, and maritime chaparral. Unit 6e supports a mix of coast live oak and Monterey pine forest. The area between Units 5, 6a, and 6e and the study area is generally developed. The area between Units 4a and 4b and the Ryan Ranch–Bishop



SOURCE: ESA, 2016; USFWS, 2016

NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-4
Designated Critical Habitat

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Interconnection Improvements site is generally undeveloped and includes a mix of grassland and oak woodland communities. The Federal Register critical habitat designation notice for Yadon's rein orchid (72 FR 60409) defines the primary constituent elements for this species as:

1. A vegetation structure providing filtered sunlight on sandy soils:
    a. Coastal pine forest (primarily Monterey pine) with a canopy cover of 20 to 70 percent, and a sparse herbaceous understory on Baywood sands, Narlon loamy fine sands, Sheridan coarse sandy loams, Tangair fine sands, Santa Lucia shaly clay loams and Chamise shaly clay loams underlain by a hardpan; or
    b. Maritime chaparral ridges with dwarfed shrubs (primarily Hooker's manzanita) on Reliz shaly clay loams, Sheridan sandy loams, Narlon sandy loams, Arnold loamy sands and soils in the Junipero–Sur complex, Rock Outcrop–Xerorthents Association, and Arnold–Santa Ynez complex often underlain by rock outcroppings.
2. Presence of nocturnal, short-tongued moths in the families Pyralidae, Geometridae, Noctuidae, and Pterophoridae.

South-Central California Coast Steelhead Distinct Population Segment

The study area is located between two critical habitat hydrologic units SCCC DPS: the Carmel River Hydrologic Unit and the Salinas Hydrologic Unit. Both the Salinas River and Tembladero Slough, which are within the Salinas Hydrologic Unit, are located within the Castroville Pipeline alignment. Tembladero Slough is also within the Castroville Pipeline optional alignment 1. The Carmel River, which is located within the Carmel River Hydrologic Unit, is located approximately 280 feet south of the proposed Carmel Valley Pump Station. The Federal Register critical habitat designation notice for SCCC DPS (70 FR 52488) defines primary constituent elements for this species as: freshwater spawning sites, freshwater rearing sites, freshwater migration corridors, estuarine areas free of obstruction, and offshore marine areas with water quality and habitat conditions suitable to support this species.

California Red-Legged Frog

Both the Main System–Hidden Hills Interconnection Improvements site and Carmel Valley Pump Station site are located within California red-legged frog critical habitat Unit MNT-2 (Carmel River). The Ryan Ranch–Bishop Interconnection Improvements site is located approximately 1.0 mile north of this unit. Unit MNT-2 includes the Carmel River drainage and nearby San Jose Creek. The Federal Register revised critical habitat designation notice for California red-legged frog (75 FR 12816) defines primary constituent elements for this species as:

1. Aquatic breeding habitat, which is described as standing bodies of fresh water including streams, pools, and other ephemeral or permanent water bodies;

2. Non-breeding aquatic and riparian habitat, which is described as freshwater pond or stream habitats that may not hold water long enough for the species to complete its life cycle, but could provide for shelter, foraging, predator avoidance, and aquatic dispersal of frogs;

3. Upland habitat, which is defined as upland areas adjacent to breeding or non-breeding aquatic habitat including various vegetation types such as grassland, woodland, forest,

wetland, or riparian areas that provide shelter, forage, and predator avoidance for frogs. Upland habitat should include boulders, rocks and organic debris, small mammal burrows, or moist leaf letter; and

3. Dispersal habitat, which is defined as accessible upland or riparian habitat within and between occupied or previously occupied sites located within 1 mile of each other. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, or other areas that do not contain features identified in 1, 2, or 3 above.

Western Snowy Plover

Western snowy plover critical habitat Unit CA 22 (Monterey to Moss Landing) includes beaches from Moss Landing south to Monterey. The northernmost slant well head and the western terminus of the Source Water Pipeline alignment are located approximately 240 feet east of, and outside of, this critical habitat unit. The remaining slant well heads are approximately 600 feet east of the critical habitat unit. Portions of the new Transmission Main, and new Desalinated Water Pipeline alignments run roughly parallel and east of this unit and are located a minimum of 0.2 to 0.6 mile from the unit. The Federal Register critical habitat designation notice for western snowy plover (77 FR 36728) defines the primary constituent elements for the western snowy plover as sandy beaches, dune systems immediately inland of an active beach face, salt flats, mudflats, seasonally exposed gravel bars, artificial salt ponds and adjoining levees, and dredge spoil sites, with:

1. Areas that are below heavily vegetated areas or developed areas and above the daily high tides;

2. Shoreline habitat areas for feeding, with no or very sparse vegetation, that are between the annual low tide or low water flow and annual high tide or high water flow, subject to inundation but not constantly under water, that support small invertebrates, such as crabs, worms, flies, beetles, spiders, sand hoppers, clams, and ostracods, that are essential food sources;

3. Surf- or water-deposited organic debris, such as seaweed (including kelp and eelgrass) or driftwood located on open substrates that supports and attracts small invertebrates described in (2) for food, and provides cover or shelter from predators and weather, and assists in avoidance of detection (crypsis) for nests, chicks, and incubating adults; and

4. Minimal disturbance from the presence of humans, pets, vehicles, or human-attracted predators, which provide relatively undisturbed areas for individual and population growth and for normal behavior.

Tidewater Goby

Tidewater goby (*Eucyclogobius newberryi*) critical habitat Unit MN-2 (Salinas River) includes the lower reach of the Salinas River. This unit is outside the geographical area occupied by the species and is not considered to be currently occupied. This unit is located within the proposed Castroville Pipeline alignment. The Federal Register critical habitat designation notice for tidewater goby (78 FR 8746) defines the primary constituent element for tidewater goby as follows:

1. Persistent, shallow (in the range of approximately 0.3 to 6.6 ft (0.1 to 2 m)), still-to-slow-moving lagoons, estuaries, and coastal streams with salinity up to 12 ppt, which provide adequate space for normal behavior and individual and population growth that contain one or more of the following:
    a. Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction;
    b. Submerged and emergent aquatic vegetation, such as *Potamogeton pectinatus*, *Ruppia maritima*, *Typha latifolia*, and *Scirpus* spp., that provides protection from predators and high flow events; or
    c. Presence of a sandbar(s) across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity.

Smith's Blue Butterfly

Critical habitat for the Smith's blue butterfly was proposed in 1977; however, it has never been finalized. The proposed Smith's blue butterfly critical habitat includes coastal sand dunes from Del Rey Creek north to the Salinas River. The subsurface slant well site, portions of the new Source Water Pipeline alignment, and portions of the new Transmission Main are within the proposed critical habitat. The Federal Register notice for the proposed determination of critical habitat for Smith's blue butterfly (42 FR 7972) does not include primary constituent elements for Smith's blue butterfly.

4.6.1.10 Sensitive Terrestrial Biological Resources in the Study Area

This section discusses the potential for sensitive terrestrial biological resources to occur at each facility in the study area. **Table 4.6-2** presents the occurrence potential for special-status species at the individual facility sites and pipeline alignments. (Refer to **Figures 3-2** through **3-13** in Chapter 3, Description of the Proposed Project, for the locations of the proposed facilities.) The list of special-status plant and animal species in **Table 4.6-2** was compiled from the CNPS on-line Electronic Inventory (CNPS, 2016); the USFWS official species list for the proposed project (USFWS, 2016a); and the CDFW's CNDDB special-status species records for the Moss Landing, Marina, Salinas, Seaside, Spreckels, Carmel Valley, Monterey, Mount Carmel, and Prunedale USGS 7.5-minute topographic quadrangles (CDFW, 2016). The occurrence potential for special-status species considers the habitat requirements and life history of the individual species, site-specific reconnaissance-level biological surveys (habitat assessments) of the project area, and focused and protocol-level surveys of special-status species at select facility locations as described in Section 4.6.1.2. As described in Section 4.6.4, Approach to Analysis, the impact analyses presented in Sections 4.6.5.1 and 4.6.5.2 consider only those species with a moderate to high potential to occur.

Subsurface Slant Wells

The subsurface slant wells include ten subsurface slant wells (the converted test slant well and nine new wells). The 10 slant wells would be located at six sites: four sites (the test slant well site and three new sites) would each have one slant well and two sites would have three slant wells at each (see **Figure 3-3a**). The well sites are numbered sequentially, with Site 1 being the northernmost site and Site 6 the southernmost site. Site 1 is located near the western terminus of the CEMEX access road, approximately 120 feet southeast of the CEMEX settling ponds. Site 1 is located along the CEMEX access road, but is situated at the approximate midpoint of the vegetated sand dunes. The majority of the remaining well clusters would be installed on the eastern side of the heavily vegetated area of the sand dunes. The construction footprint of the nine new permanent slant wells and conversion of the test slant well into a permanent well is approximately 9 acres. A portion of this construction footprint overlaps with a portion of the construction footprints for the Source Water Pipeline and Source Water Pipeline using the optional alignment.

The subsurface slant well construction area is comprised of areas of relatively undisturbed central dune scrub, formerly disturbed sand dunes that are revegetating with native and non-native dune scrub vegetation, and unvegetated disturbed sandy soil in actively mined areas. The areas of relatively intact scrub occur along the western active mining area boundary (just east of the unvegetated beach area) and at the west end of the access road in the vicinity of the settling ponds. The current and recently disturbed areas occur east of the vegetated sand dunes and south of the CEMEX access road. Central dune scrub within the subsurface slant wells site and CEMEX active mining area includes iceplant and native plant species typically found in central dune scrub or foredune vegetation communities such as California sagebrush, coast buckwheat, mock heather, beach evening primrose, and sea rocket.

The entire subsurface slant well area within the coastal zone would likely be considered primary habitat under the City of Marina's LCLUP (City of Marina, 2013) and ESHA by the CCC.

There are no potentially jurisdictional waters of the U.S. and/or waters of the state within the slant well study area, although a wetland delineation has not been verified by the USACE, RWQCB, and CCC. MBNMS is not included in the LCLUP study area.

Table 4.6-2 presents the potential for special-status species to occur at the subsurface slant well site. Western snowy plover, ocean bluff milkvetch, Monterey spineflower, sand-loving wallflower, and coast buckwheat (host plant for Smith's blue butterfly) have been observed within the site (ESA, 2013, 2014, 2016; AECOM, 2016). Special-status plant and wildlife species that have not been observed at the site but that could potentially occur in central dune scrub at this site include robust spineflower, seaside bird's-beak, Menzies' wallflower, sand gilia, Smith's blue butterfly, globose dune beetle, Hooker's manzanita, sandmat manzanita, Monterey Coast paintbrush, Monterey ceanothus, branching beach aster, Eastwood's goldenbush, Kellogg's horkelia, northern curly-leaved monardella, south coast branching phacelia, Michael's rein orchid, black legless lizard, silvery legless lizard, and coast horned lizard.

TABLE 4.6-2
SPECIAL-STATUS SPECIES WITH THE POTENTIAL TO OCCUR AT PROJECT FACILITIES

				Pipelines North of Reservation Road				Facilities and Improvements South of Reservation Road					
Species	**Status (USFWS/ CDFW/ CRPR)**	**Subsurface Slant Wells**	**MPWSP Desalination Plant**	**Source Water Pipeline**	**New Desalinated Water Pipeline**	**Castroville Pipeline**	**Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond**	**ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline**	**New Transmission Main**	**Carmel Valley Pump Station**	**Ryan Ranch-Bishop Interconnection Improvements**	**Main System-Hidden Hills Interconnection Improvements**	**Staging Areas**
Federal or State Listed Species													
Plants													
Monterey spineflower	FT/--/CRPR 1B.2	O	O	O	O	O	L	O	O	N	N	N	H
robust spineflower	FE/CRPR 1B.1	M	L	M	M	M	L	M	M	N	N	N	M
Seaside bird's-beak	SE/CRPR 1B.1	M	L	M	M	M	L	M	M	N	N	N	M
Menzies' wallflower	FE/SE/ CRPR 1B.1	M	N	M	M	M	N	N	O	N	N	N	L-M
sand gilia	FE/ST/ CRPR 1B.2	H	L	H	M	M	L	H	H	N	N	N	M
Yadon's rein orchid	FE/CRPR 1B.1	N	N	N	N	N	N	M	L	N	L	M	L-M
Pacific Grove clover	--/SR/CRPR 1B.1	N	N	L	L	L	N	L	L	N	L-M	L-M	N
Invertebrates													
Smith's blue butterfly	FE/--	H	N	H	H	N	N	L	H	N	N	N	L-M
Fish													
South-Central California Coast Steelhead DPS	FT/CSSC	N	N	N	N	M	N	N	N	N	N	N	N
Amphibians													
California tiger salamander	FT/ST	N	L-M	L-M	L-M	L-M	L-M	L	L	N	L-M	L-M	L-M
California red-legged frog	FT/CSSC	N	M	L-M	L-M	L-M	L-M	L	L	H	L-M	L-M	L-M
Birds													
Western snowy plover	FT/CSSC	O	N	O	N	N	N	N	N	N	N	N	N
Other Special-Status Species													
Invertebrates													
globose dune beetle	Local	H	N/A	H	L	N/A	N/A	N/A	L	N/A	N/A	N/A	L
Plants													
Hickman's onion	CRPR 1B.2	N	N	N	N	N	N	L	N	N	L-M	L-M	L
Hooker's manzanita	CRPR 1B.2	M	N	M	M	N	N	M	O	N	L	M	L-M
Toro manzanita	CRPR 1B.2	N	N	N	N	N	N	M	M	N	M	M	L
Pajaro manzanita	CRPR 1B.1	N	N	N	N	N	N	M	M	N	M	M	N
sandmat manzanita	CRPR 1B.2	M	N	H	H	N	N	O	O	N	L	M	H
ocean bluff milkvetch	CRPR 4.2	O	N	O	L	N	N	M	L	N	N	N	L
Monterey Coast paintbrush	CRPR 4.3	H	N	H	H	M	N	M	O	L	L	L	M
Monterey ceanothus	CRPR 4.2	M	N	M	M	N	N	O	O	N	N	N	O
Congdon's tarplant	CRPR 1B.1	N	L-M	L	L	L-M	L	L	L	N	M	M	L

<u>Potential To Occur Codes:</u>
N= Not expected to occur: No suitable habitat within project area; project area outside currently known distribution or elevation range; no nearby documented occurrences or nearby documented occurrences are historical only.
L = Low potential to occur: Potentially suitable habitat highly limited and/or of marginal quality; potentially suitable habitat present but species not documented nearby.
M = Moderate potential to occur: Low to moderate quality habitat present; species documented in the project vicinity.
H = High potential to occur: High quality suitable habitat present within project area; species documented in the project vicinity.
O = Observed: Species (or an indication that the species is present) was observed in the project area during field surveys conducted by ESA or others.
N/A = Not considered sensitive within local jurisdiction at these facilities.

TABLE 4.6-2 (Continued)
SPECIAL-STATUS SPECIES WITH THE POTENTIAL TO OCCUR AT PROJECT FACILITIES

				Pipelines North of Reservation Road				Facilities and Improvements South of Reservation Road					
Species	**Status (USFWS/ CDFW/ CRPR)**	**Subsurface Slant Wells**	**MPWSP Desalination Plant**	**Source Water Pipeline**	**New Desalinated Water Pipeline**	**Castroville Pipeline**	**Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond**	**ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline**	**New Transmission Main**	**Carmel Valley Pump Station**	**Ryan Ranch-Bishop Interconnection Improvements**	**Main System-Hidden Hills Interconnection Improvements**	**Staging Areas**
Other Special-Status Species (cont.)													
Plants (cont.)													
branching beach aster	CRPR 3.2	H	N	O	O	O	N	L	O	N	N	N	H
Eastwood's goldenbush	CRPR 1B.1	M	N	L-M	L-M	L-M	N	M	M	N	L	M	L-M
sand-loving wallflower	CRPR 1B.2	O	N	M	M	M	N	M	O	N	N	N	L-M
Kellogg's horkelia	CRPR 1B.1	M	N	H	O	M	N	O	O	N	L	L	M
Carmel Valley bush-mallow	CRPR 1B.2	N	N	N	N	N	N	M	N	N	M-H	M-H	L
marsh microseris	CRPR 1B.2	L	N	L	L	N	N	L	L	N	M	L-M	N
northern curly-leaved monardella	CRPR 1B.2	M	N	M	M	M	N	M-H	M-H	N	L	L	L-M
south coast branching phacelia	CRPR 3.2	H	N	H	H	M	N	H	M	N	N	N	L-M
Monterey pine	CRPR 1B.1	N	N	N	N	N	N	N	N	M	L-M	L-M	N
Michael's rein orchid	CRPR 4.2	M	N	H	H	M	N	H	O	L	L-M	L-M	L-M
Santa Cruz microseris	CRPR 1B.2	L	N	L	L	L	N	L	L	N	L-M	L-M	N
Santa Cruz clover	CRPR 1B.1	N	N	L	L	L	N	L	L	N	L-M	L-M	N
Reptiles													
Western pond turtle	CSSC	N	N	N	M	L-M	N	N	N	N	N	N	N
black legless lizard	CSSC	M-H	L	M	M	L-M	N	H	M-H	N	N	N	M
silvery legless lizard	CSSC	M-H	L	M	M	L-M	N	H	M-H	N	N	N	M
coast horned lizard	CSSC	M-H	L	L-M	L-M	L	N	M	L-M	N	L	L	L-M
Coast Range newt	CSSC	N	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M
Birds													
tricolored blackbird	CSSC (nesting)	N	L	N	O	L	N	L	M	L	L	L	L
short-eared owl	CSSC (nesting)	L	M	M	M	L-M	L	L	M	N	N	N	L-M
western burrowing owl	CSSC (nesting, wintering)	N	L	H	H	L	N	L	L-M	N	N	N	L-M
red-tailed hawk	3503.5	L	H	H	H	H	H	H	H	H	H	H	H
red-shouldered hawk	3503.5	L	M-H	M	M	L	M	H	H	H	H	H	H
Ferruginous hawk	WL (wintering)	N	L-M	H	H	L-M	N	L	L-M	N	N	N	L
Northern harrier	3503.5 (nesting)	L	M	M	M	L-M	L	L-M	M	N	N	N	M
White-tailed kite	--/FP (nesting)	L	M	M-H	M-H	L-M	M	M	M-H	L-M	L-M	L-M	M
California horned lark	WL	L	H	H	H	L-M	L	L	H	L	L-M	L	M
American peregrine falcon	FD/SD/FP	L	M	H	H	M	M	L-M	H	L-M	L-M	L-M	L
American kestrel	3503.5	L	M	H	H	L-M	M	M	H	M	M	M	M
loggerhead shrike	CSSC (nesting)	L	M	H	H	M	H	H	H	M	H	H	M

Potential To Occur Codes:
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L = Low potential to occur: Potentially suitable habitat highly limited and/or of marginal quality; potentially suitable habitat present but species not documented nearby.
M = Moderate potential to occur: Low to moderate quality habitat present; species documented in the project vicinity.
H = High potential to occur: High quality suitable habitat present within project area; species documented in the project vicinity.
O = Observed: Species (or an indication that the species is present) was observed in the project area during field surveys conducted by ESA or others.
N/A = Not considered sensitive within local jurisdiction at these facilities.

TABLE 4.6-2 (Continued)
SPECIAL-STATUS SPECIES WITH THE POTENTIAL TO OCCUR AT PROJECT FACILITIES

				Pipelines North of Reservation Road				Facilities and Improvements South of Reservation Road					
Species	**Status (USFWS/ CDFW/ CRPR)**	**Subsurface Slant Wells**	**MPWSP Desalination Plant**	**Source Water Pipeline**	**New Desalinated Water Pipeline**	**Castroville Pipeline**	**Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond**	**ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline**	**New Transmission Main**	**Carmel Valley Pump Station**	**Ryan Ranch-Bishop Interconnection Improvements**	**Main System-Hidden Hills Interconnection Improvements**	**Staging Areas**
Other Special-Status Species (cont.)													
Mammals													
pallid bat	CSSC	N	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M
Salinas kangaroo rat	Local	L	N/A	L	L-M	N/A	N/A	N/A	L-M	N/A	N/A	N/A	L-M
western red bat	CSSC	N	L-M	L-M	M	M	L-M	L-M	L-M	L-M	L-M	L-M	L-M
Monterey dusky-footed woodrat	CSSC	N	N	N	N	N	N	M	M	M	M	M	L-M
Monterey shrew	CSSC	N	L	N	N	L	N	M	M	L-M	M	M	L-M
American badger	CSSC	N	L-M	M	M	L-M	L	L-M	M	N	L-M	L-M	L-M

Potential To Occur Codes:
N= Not expected to occur: No suitable habitat within project area; project area outside currently known distribution or elevation range; no nearby documented occurrences or nearby documented occurrences are historical only.
L = Low potential to occur: Potentially suitable habitat highly limited and/or of marginal quality; potentially suitable habitat present but species not documented nearby.
M = Moderate potential to occur: Low to moderate quality habitat present; species documented in the project vicinity.
H = High potential to occur: High quality suitable habitat present within project area; species documented in the project vicinity.
O = Observed: Species (or an indication that the species is present) was observed in the project area during field surveys conducted by ESA or others.
N/A = Not considered sensitive within local jurisdiction at these facilities.

SPECIAL-STATUS SPECIES CODE DESIGNATIONS:

Federal
FE = Federally listed as endangered
FT = Federally listed as threatened
FD = Federally delisted

State
SE = State listed as endangered
ST = State listed as threatened
SR = State listed as rare
SD = State delisted
FP = State Fully Protected
WL = State watch list
CSSC = California species of special concern
3503.5 = Section 3503.5 of the California Fish and Game Code prohibits take, possession, or destruction of any birds in the orders Falconiformes (hawks) or Strigiformes (owls), or of their nests and eggs.

Local = considered sensitive in a local plan

California Rare Plant Rank (Formerly known as CNPS List):
1A = Plants presumed extinct in California.
1B = Plants rare, threatened, or endangered in California and elsewhere.
2A = Plants presumed extirpated in California.
2B = Plants rare, threatened, or endangered in California, but more common elsewhere.
3 = Plants about which more information is needed.
4 = Plants of limited distribution.

An extension reflecting the level of threat to each species is appended to each CRPR as follows:
.1 – Seriously threatened in California.
.2 – Moderately threatened in California.
.3 – Not very threatened in California.

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MPWSP Desalination Plant

The proposed MPWSP Desalination Plant and associated facilities (including the pretreatment system, Reverse Osmosis system, post-treatment system, chemical storage, and administrative building) are located on the upper terrace (approximately 25 acres) of a 46-acre vacant parcel on the north side of Charles Benson Road and approximately 675 feet south of the Salinas River. Approximately 25 acres would be developed.

The majority of the proposed MPWSP Desalination Plant site is comprised of non-native annual grassland. Although this area contains non-native grassland species as dominants, there is significant cover from ruderal species such as field mustard, radish, dwarf nettle, and chickweed. Site soils are sandy. A small patch of yellow bush lupine scrub is located in the northeastern corner of the site.

There are no potentially jurisdictional waters of the U.S. or waters of the state within the MPWSP Desalinated Plant study area, although a wetland delineation has not been verified by the USACE and RWQCB.

Monterey spineflower was observed during botanical surveys of the proposed MPWSP Desalinated Plant (AECOM, 2016). This site could support Congdon’s tarplant, a species that can be found in disturbed vegetation communities. Although the site does not contain high quality upland habitat for California red-legged frog, this species has been observed in the Salinas River, approximately 0.75 mile east of the site, and could occur in grassland at the MPWSP Desalination Plant site. Similarly, the site does not contain high quality upland habitat for California tiger salamander. However, if California tiger salamander are present in a drainage ditch or retention pond located approximately 250 feet from the site, they could occur in grassland at the MPWSP Desalination plant site. Similarly, if Coast Range newt occur in the Salinas River, drainage ditch or retention pond, they have potential to occur in grassland at the site. Additionally, American badger could occur at the site.

Table 4.6-2 lists the potential for special-status species to occur at the MPWSP Desalination Plant site. Several mature ornamental eucalyptus and Monterey cypress trees border the site along its southern and western boundaries. These trees may provide potential nesting habitat for raptors such as red-tailed hawk, red-shouldered hawk, and American kestrel and special-status bat species. Short-eared owl, northern harrier, white-tailed kite and American peregrine falcon could forage over the site. The entire site provides nesting habitat for California horned lark and loggerhead shrike and common passerines protected under the MBTA.

Pipelines and Other Conveyance Facilities North of Reservation Road

Pipelines north of Reservation Road include the Source Water Pipeline, Source Water Pipeline Optional alignment, new Desalinated Water Pipeline, new Desalinated Water Pipeline Optional alignment, Castroville Pipeline, Castroville Pipeline Optional alignment, Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond.

Source Water Pipeline

The Source Water Pipeline extends east from the subsurface slant wells in the CEMEX active mining area, along the CEMEX access road, Lapis Road, and, parallel and north of Charles Benson Road, to the MPWSP Desalination Plant site. The construction footprint is approximately 16.4 acres. A portion of this footprint overlaps with a portion of the construction footprints for the subsurface slant well, Castroville Pipeline, Castroville Pipeline using the optional alignment 1, Castroville Pipeline using the optional alignment 2, the new Desalinated Water Pipeline, and the new Desalinated Water Pipeline using the optional alignment. The optional alignment for the Source Water Pipeline would be identical to the alignment described above, except that the 0.8-mile-long segment that runs along Charles Benson Road would be installed within the paved Charles Benson Road right-of-way (as opposed to north of and outside of the right-of-way). The construction footprint for the Source Water Pipeline using the optional alignment is approximately 16.5 acres. A portion of the construction footprint for the Source Water Pipeline using the optional alignment overlaps with a portion of the construction footprints for the subsurface slant well, Castroville Pipeline, Castroville Pipeline using the optional alignment 1, Castroville Pipeline using the optional alignment 2, the new Desalinated Water Pipeline, and the new Desalinated Water Pipeline using the optional alignment.

The study area within this alignment contains central dune scrub along the developed CEMEX access road and a mix of central dune scrub, comprised of silver dune lupine-mock heather scrub and California sagebrush scrub alliances, coyote brush scrub, ice plant mats, agricultural and ruderal areas from the CEMEX entrance to the intersection of Lapis Road and Del Monte Boulevard. Central dune scrub within the CEMEX active mining area along the access road contains relatively high cover of native dune scrub species. Central dune scrub and coyote brush scrub communities east of the CEMEX active mining area are moderately disturbed and include non-native invasive species such as radish, mustard, and iceplant. The developed CEMEX entrance is surrounded by large eucalyptus and Monterey cypress trees. From Lapis Road the Source Water Pipeline alignment extends through non-native grassland and agricultural fields to the MPWSP Desalination Plant site. A mix of Monterey cypress stands, Eucalyptus groves, ruderal areas, and iceplant mats which border Charles Benson Road to the north. The 0.8-mile-long segment of the proposed pipeline alignment north of and outside of the Charles Benson Road right-of-way would be located along the north side of the row of trees and along the southern boundary of agricultural lands. The Source Water Pipeline Optional Alignment would be installed entirely within the paved Charles Benson Road right-of-way, outside of the agricultural lands and on the south side of the row of trees.

Undeveloped areas in the coastal zone within the City of Marina would likely be considered primary habitat under the City of Marina's LCLUP and ESHA by the CCC. Additionally, undeveloped areas outside of the City of Marina, but within the coastal zone, may be designated as ESHA under the North County Land Use Plan Local Coastal Program and/or by the CCC.

There are no potentially jurisdictional waters of the U.S. or waters of the state along the Source Water Pipeline (including the Source Water Pipeline Optional Alignment) alignment, although a wetland delineation has not been verified by the USACE, RWQCB, and CCC.

Table 4.6-2 lists all special-status species with potential to occur along the Source Water Pipeline alignment. Monterey spineflower was observed along the CEMEX access road within the active mining area (Zander, 2013; 2014). Branching beach aster has been observed along Lapis Road and the CEMEX access road during protocol level plant surveys conducted for the proposed project (URS, 2014b). Coast buckwheat, the host plant for Smith's blue butterfly, has been observed along the CEMEX access road within the CEMEX active mining facility (Zander, 2014) and Smith's blue butterfly has potential to occur in this area. Western snowy plover is known to nest in the beach and foredunes at the western edge of the proposed Source Water Pipeline alignment (PRBO, 2012 in Zander Associates, 2013). Ocean bluff milkvetch has been observed along the proposed Source Water Pipeline alignment within the CEMEX active mining area during botanical surveys of the project area in 2015 (AECOM, 2016). Robust spineflower, seaside bird's beak, Menzies' wallflower, sand gilia, Hooker's manzanita, sandmat manzanita, Monterey Coast paintbrush, Monterey ceanothus, Eastwood's goldenbush, sand-loving wallflower, Kellogg's horkelia, northern curly-leaved monardella, south coast branching phacelia, Michael's rein orchid, and globose dune beetle have potential to occur within central dune scrub in the project area. California red-legged frog, California tiger salamander, and Coast Range newt have potential to occur in non-native grassland in the northern portion of the pipeline alignment during dispersal. Reptiles that are known to occur in scrub communities with sandy soils, such as black legless lizard, silvery legless lizard, and coast horned lizard, could potentially occur within central dune scrub in this area. American badger may occur within non-native grassland. Wintering western burrowing owls and Ferruginous hawk have also been observed on the Armstrong Ranch property (CDFW, 2016) and could occur within grassland in or adjacent to the pipeline alignment. Pallid bat has a low to moderate potential to roost within crevices underneath the Highway 1 overpass. Raptors such as red-tailed hawk, white-tailed kite, short-eared owl, northern harrier, California horned lark, and loggerhead shrike could potentially nest and/or forage throughout the pipeline alignment and special-status bat species could roost within trees in the alignment.

New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment

The new Desalinated Water Pipeline would extend from the MPWSP Desalination Plant west, north of and parallel to Charles Benson Road, then turn north on Del Monte Boulevard for approximately 800 feet to Lapis Road, then continue south along Lapis Road to another Lapis Road/Del Monte Boulevard intersection, then turn south and continue south along Del Monte Boulevard to Reservation Road. The construction footprint is approximately 35.4 acres. A portion of the construction footprint for the new Desalinated Water Pipeline overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, Castroville Pipeline, Castroville Pipeline using the optional alignment 1, and Castroville Pipeline using the optional alignment 2. The new Desalinated Water Pipeline Optional alignment would be identical to the alignment described in the paragraph above, except that the 0.8-mile-long segment that runs along Charles Benson Road would be installed within the Charles Benson Road paved right-of-way (as opposed to north of and outside of the right-of-way). The construction footprint for the new Desalinated Water Pipeline using the optional alignment is approximately 35.5 acres. A portion of the construction footprint for the new Desalinated Water Pipeline using the optional alignment overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, Castroville Pipeline, Castroville using the optional alignment 1, and Castroville Pipeline using the optional alignment 2.

The alignment north of Charles Benson Road is the same as that described above for the Source Water Pipeline; it includes non-native annual grassland and agricultural land bordered on the south by Monterey cypress and eucalyptus trees. As described for the New Source Water Pipeline Optional alignment, the new Desalinated Water Pipeline Optional alignment would travel through the developed Charles Benson Road along this segment. The alignment from the intersection of Charles Benson Road and Del Monte Boulevard south to Marina Green Drive includes a mix of moderately disturbed central dune scrub, including silver dune lupine-mock heather scrub, sandmat manzanita chaparral, California sagebrush-California buckwheat scrub, California sagebrush scrub and deerweed scrub alliances, coyote brush scrub, non-native annual grassland, ice plant mats, ruderal, and developed roadways. The segment between Marina Green Drive and Reservation Road is largely dominated by ruderal areas, developed/landscaped areas, and ice plant mats and is surrounded by urban development. Some native communities, such as central dune scrub, coyote brush scrub, and coast live oak woodland, occur within this segment, but they are highly disturbed. Several Monterey cypress stands and eucalyptus groves also occur within the segment between Marina Green Drive and Reservation Road. Riparian woodland and scrub communities associated with Locke-Paddon Park occurs near Reservation Road within the alignment.

Undeveloped areas in the coastal zone in the City of Marina may be considered primary habitat under the City of Marina's LCLUP and ESHA by the CCC. Undeveloped areas within the coastal zone north of the City of Marina may be considered ESHA under the North County Land Use Plan Local Coastal Program and by the CCC.

Riparian woodland and scrub at Locke-Paddon Park and an isolated willow thicket near the intersection of Marina Green Drive and Del Monte Boulevard are potentially jurisdictional waters of the U.S./waters of the state.

Table 4.6-2 lists all potential special-status species with potential to occur along the Desalinated Water Pipeline alignment. Despite disturbance, Monterey spineflower and Kellogg's horkelia were observed within central dune scrub along Del Monte Boulevard during surveys conducted for the proposed project (ESA, 2012; 2016). Branching beach aster was observed along Del Monte Boulevard during protocol level plant surveys conducted for the proposed project (URS, 2014b). Robust spineflower, seaside bird's beak, Menzies' wallflower, sand gilia, Hooker's manzanita, sandmat manzanita, ocean bluff milkvetch, Monterey Coast paintbrush, Monterey ceanothus, south coast branching phacelia, Michael's rein orchid, Eastwood's goldenbush, sand-loving wallflower, northern curly-leaved Monardella, south coast branching phacelia, and Michael's rein orchid have potential to occur within suitable habitat in the project area. California red-legged frog and California tiger salamander have potential to occur in non-native grassland in the northern portion of the pipeline alignment. Coast Range newt have potential to occur in grassland and woodland habitat and adjacent to the pond at Locke-Paddon Park. Salinas kangaroo rat has potential to occur in grassland or scrub habitat. Black legless lizard, silvery legless lizard, and coast horned lizard, could potentially occur within central dune scrub in this area. Western pond turtle may occur at the brackish water pond on Beach Road west of the pipeline. American badger may occur within the non-native grassland. Western burrowing owls and wintering Ferruginous hawks have also been observed on the Armstrong Ranch property (CDFW, 2016) and could occur within grassland in or adjacent to the pipeline alignment. Raptors such as red-tailed hawk, short-eared owl, northern harrier, white-tailed kite, and passerines such as California horned lark and loggerhead shrike, could potentially nest and/or forage throughout the pipeline alignment and special-status bat species could roost within trees in the alignment.

Riparian woodland and scrub adjacent to the pond in Locke-Paddon Park has the potential to support western pond turtle. Tricolored blackbird has been observed within Locke-Paddon Park (CDFW, 2016; eBird, 2016) and could occur along the pipeline alignment.

Castroville Pipeline and Castroville Pipeline Optional Alignments

The 4.5-mile-long Castroville Pipeline would extend west from the MPWSP Desalination Plant north of, and parallel to Charles Benson Road, to Del Monte Boulevard. The pipeline would travel north on Del Monte Boulevard for approximately 800 feet where it turns north along the TAMC right-of-way to the Salinas River. From the Salinas River it continues on the TAMC right-of-way to the intersection of Monte Road and Nashua Road. From this intersection the pipeline would extend north along an agricultural road to Highway 183, then would continue north on Del Monte Avenue for approximately 500 feet. The construction footprint is approximately 15.0 acres. A portion of the Castroville Pipeline construction footprint overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, new Desalinated Water Pipeline, and new Desalinated Water Pipeline using the optional alignment. The Castroville Pipeline Optional alignment 1 would be identical to the Castroville Pipeline alignment except that at the intersection of Monte Road and Nashua Road the alignment would turn northwest along Nashua Road to the Monterey Peninsula Recreational Trail. The optional pipeline would continue northeast along the Monterey Peninsula Recreational Trail for approximately 1.5 mile to Highway 183, then continue southeast on Highway 183 for approximately 0.7 mile. The construction footprint for the Castroville Pipeline using the optional alignment 1 is approximately 16.2 acres. A portion of the construction footprint for the Castroville Pipeline using the optional alignment 1 overlaps with a portion of the construction footprints for Source Water Pipeline, Source Water Pipeline using the optional alignment, new Desalinated Water Pipeline, and new Desalinated Water Pipeline using the optional alignment. The Castroville Pipeline Optional alignment 2 would be identical to the Castroville Pipeline alignment except, similar to the Source Water Pipeline and new Desalinated Water Pipeline Optional alignments, the 0.8-mile segment along the Charles Benson Road would be installed within the paved Charles Benson Road right-of-way (as opposed to north of and outside of the paved road right-of-way). The construction footprint for the Castroville Pipeline using the optional alignment 2 is approximately 15.1 acres. A portion of the construction footprint for the Castroville Pipeline using the optional alignment 2 overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, new Desalinated Water Pipeline, and new Desalinated Water Pipeline using the optional alignment.

The alignment segment that parallels Charles Benson Road to the north is the same as that described above for the Source Water Pipeline and new Desalinated Water Pipeline; it includes non-native annual grassland and agricultural land bordered on the south by Monterey cypress and eucalyptus trees. As described for the Source Water Pipeline and new Desalinated Water Pipeline Optional alignments, the Castroville Pipeline Optional alignment 2 would travel through the developed Charles Benson Road along this segment. The Castroville Pipeline alignment then traverses through developed areas, ruderal areas, coyote brush scrub, and ice plant mats with a few isolated patches of central dune scrub and non-native grassland before crossing through agricultural lands, ruderal, and developed areas until it reaches the Salinas River. The Salinas River includes open water and adjacent riparian woodland and scrub, coyote brush scrub, and northern coastal scrub communities. North of the Salinas River the study area includes mostly agricultural, developed, and ruderal areas until it crosses over Tembladero Slough. North of Tembladero Slough, the alignment passes through a mix of agricultural, developed, ruderal, coyote brush scrub, riparian woodland and scrub and freshwater marsh communities. The Castroville Pipeline Optional alignment 1 would pass through similar habitat types, which include mostly agricultural, ruderal and developed areas and a few isolated freshwater wetlands and the open water of Tembladero Slough.

A small segment of the proposed Castroville Pipeline alignment is located within the coastal zone. Undeveloped habitat within this area may be designated as ESHA under the North County Land Use Plan Local Coastal Program and by the CCC.

There are a few potentially jurisdictional waters of the U.S./water of the state within the Castroville Pipeline alignment which include the Salinas River, Tembladero Slough, riparian woodland and scrub communities, freshwater marsh communities, and a few culverts and ditches.

Table 4.6-2 lists all potential special-status species with potential to occur along the Castroville Pipeline alignment and the same species would be expected to occur along the Castroville Pipeline using the optional alignment 1 and using the optional alignment 2. Monterey spineflower and branching beach aster have been observed within the alignment north of the intersection of Charles Benson Road and Del Monte Boulevard. Although these areas are fairly disturbed they have potential to support other special-status plants that occur in central dune scrub. California red-legged frog could occur in the Salinas River, Tembladero Slough and willow areas north of Tembladero Slough. California red-legged frog and California tiger salamander could occur in upland grassland areas within approximately 1.2 miles of potential breeding habitat. American badger could occur in non-native grassland. Coast Range newt could occur in and around Tembladero Slough and the Salinas River and in adjacent grassland areas. Black legless lizard, silvery legless lizard, and coast horned lizard, could potentially occur within the small areas of central dune scrub in this area. Red-tailed hawk, short-eared owl, northern harrier, white-tailed kite, American peregrine falcon, American kestrel, California horned lark, and loggerhead shrike could forage in the vicinity of the alignment. Common passerine birds such as northern rough-winded swallow (*Stelgidopteryx serripennis*) could nest in the riparian vegetation bordering the Salinas River or beneath the road crossings along the alignment. Special-status bat species could roost in trees and beneath bridge crossings along the alignment.

Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond

The 1-mile-long Brine Discharge Pipeline and 1.2-mile-long Pipeline to CSIP Pond alignments extend between the MPWSP Desalination Plant site and the existing MRWPCA Regional

Wastewater Treatment Plant. The pipelines would be installed along access roads and through mostly ruderal and developed areas within the MRWPCA Regional Wastewater Treatment Plant, although some patches of non-native grassland are present. These pipeline alignments are located adjacent to ornamental Monterey cypress stands present along the access roads. The Brine Mixing Box would be installed at the terminus of the Brine Discharge Pipeline where ruderal, non-native grassland is present. The construction footprint for both of these pipelines and the Brine Mixing Box combined is approximately 7.4 acres, including the Brine Mixing Box construction staging area.

There are no potentially jurisdictional waters of the U.S. or waters of the state within the Brine Discharge Pipeline, Pipeline to CSIP Pond, or the Brine Mixing Box study areas, although a wetland delineation has not been verified by the USACE and RWQCB. However, one potentially jurisdictional pond feature is located adjacent to the pipeline alignment study area.

Table 4.6-2 lists all potential special-status species with potential to occur along the Brine Discharge Pipeline and Pipeline to CSIP alignments and the Brine Mixing Box project area. California red-legged frog, California tiger salamander, and Coast Range newt have potential to occur in grassland and grazed grassland/agricultural areas within the pipeline alignments and Brine Mixing Box construction footprint during dispersal. The mature Monterey cypress trees along Charles Benson Road and the access road to the MRWPCA Regional Wastewater Treatment Plant could provide roosting, foraging, and/or nesting habitat for loggerhead shrike, a variety of raptors such as red-tailed hawk and red-shouldered hawk, and provide roosting habitat for special-status bats. Additionally, passerines such as California horned lark may occasionally forage and nest within the grazing lands. Non-native grassland within the MRWPCA Regional Wastewater Treatment Plant site may provide nesting habitat for common passerines but does not generally provide suitable habitat for other special-status species due to its isolation from large expanses of non-native grassland.

Improvements to ASR System (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline)

The proposed ASR facilities include two new ASR injection/extraction wells (ASR-5 and ASR-6 Wells) and three parallel 0.9-mile-long, 30-inch-diameter ASR pipelines (ASR Recirculation Pipeline, ASR Conveyance Pipeline, and ASR Pump-to-Waste Pipeline). The pipelines would be located within General Jim Moore Boulevard between Ardennes Circle and Coe Avenue. The construction footprint for all three ASR pipelines is approximately 8.8 acres. A portion of the construction footprint for the ASR pipelines overlaps with a portion of the construction footprints for the new Transmission Main and the new Transmission Main using the optional alignment. The ASR-5 and ASR-6 Wells would be located east of General Jim Moore Boulevard near Ardennes Circle. Each ASR well would be housed in a permanent 900-square foot concrete pump house. Chain-link fencing would encompass an approximately 0.4-acre and 0.5-acre area around the ASR-5 and ASR-6 Wells, respectively. Therefore, the construction footprint for both of the ASR Wells is expected to be approximately 0.9 acre. Additionally, water produced during development of the ASR-5 and ASR-6 Wells would be conveyed to a natural depression located east of General Jim Moore Boulevard near San Pablo Avenue. The construction footprint of the area where water would be conveyed is approximately 7.0 acres.

The ASR-5 and ASR-6 Well sites are located between General Jim Moore Boulevard and single family residences. The sites contain a mix of coast live oak woodland, coyote brush scrub, and ruderal areas. The pipelines would be installed within developed General Jim Moore Boulevard. The northern end of the pipeline alignments are bordered by a mix of single family residences and moderately disturbed coast live oak woodland, coyote brush scrub, ice plant mats, and ruderal areas, while the southern end of the alignments are bordered by relatively undisturbed northern coastal scrub and coast live oak woodland on former Fort Ord lands. The area where water produced during development of the ASR-5 and ASR-6 wells would be conveyed is located on former Fort Ord lands and contains a mix of central maritime chaparral and ruderal areas.

There are no potentially jurisdictional waters of the U.S. or waters of the state within the ASR Facilities study areas, although a wetland delineation has not been prepared by the USACE and RWQCB.

Table 4.6-2 lists all potential special-status species with potential to occur at the ASR facilities. Kellogg’s horkelia has been observed within the development water infiltration area that will be used during development of the ASR-5 and ASR-6 Wells (CDFW, 2016). Monterey spineflower, sandmat manzanita, Kellogg’s horkelia, and Monterey ceanothus were observed along the pipeline alignment during reconnaissance surveys and focused botanical surveys of the project area along General Jim Moore Boulevard (ESA, 2016; AECOM, 2016). Additionally, a variety of special-status plant species known to occur in scrub communities with sandy soils could potentially occur along this stretch of General Jim Moore Boulevard including Monterey spineflower, robust spineflower, seaside birds-beak, sand gilia, Yadon’s rein orchid, Hooker’s manzanita, Toro manzanita, Pajaro manzanita, ocean bluff milkvetch, Monterey Coast paintbrush, Monterey ceanothus, Eastwood’s goldenbush, sand-loving wallflower, Kellogg’s horkelia, Carmel Valley bush-mallow, northern curly-leaved monardella, south coast branching phacelia, and Michael’s rein orchid.

Silvery legless lizard, black legless lizard, and coast horned lizard could potentially occur within central dune scrub, northern coastal scrub, and coyote brush scrub, in sandy soils within the grassland, or on edges of the coast live oak woodland habitat. Coast Range newt could occur in woodland areas. Raptors such as red-tailed hawk, red-shouldered hawk, northern harrier, white-tailed kite, American kestrel, and loggerhead shrike have potential to nest and forage within or adjacent to the project area. Special-status bats have potential to roost in trees within the project area. Northern coastal scrub and coast live oak woodland also provide potential habitat for Monterey dusky-footed woodrat, Monterey shrew, and American badger.

Pipelines and Other Conveyance Facilities South of Reservation Road

Facilities and improvements south of Reservation Road include the new Transmission Main, new Transmission Main Optional alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

New Transmission Main and New Transmission Main Optional Alignment

The new 6-mile-long, 36-inch-diameter Transmission Main pipeline alignment begins at Reservation Road and continues south along the west side of Del Monte Boulevard between the Monterey Peninsula Recreational Trail and TAMC right-of-way to a point approximately 750 feet north of the Highway 1/ Lightfighter Drive interchange. From the interchange it travels east through undeveloped areas, then along Lightfighter Drive to General Jim Moore Boulevard. It then travels south along General Jim Moore Boulevard to the existing Phase I ASR Facilities near the intersection of General Jim Moore Boulevard and Coe Avenue. The construction footprint is approximately 27.1 acres. A portion of the new Transmission Main construction footprint overlaps with a portion of the ASR pipelines construction footprint. The optional alignment for the new Transmission Main would be identical to the alignment described above, except that it would turn southeast toward Lightfighter Drive in a slightly different location than the new Transmission Main alignment. The construction footprint for the new Transmission Main using the optional alignment is 26.8 acres. A portion of the construction footprint for the new Transmission Main using the optional alignment overlaps with a portion of the construction footprint for the ASR pipelines.

The pipeline segment between Reservation Road and the Highway 1 overcrossing is fairly disturbed and includes ice plant mats and ruderal areas with a few Monterey cypress stands and eucalyptus groves. South of the Highway 1 overcrossing the alignment follows the back of the dunes associated with Fort Ord Dunes State Park. These back dune areas contain low to moderately disturbed central dune scrub (including silver dune lupine-mock heather scrub, sandmat manzanita, and island buckwheat scrub alliances), ice plant mats, coyote brush scrub, and some ruderal and developed areas. Once the segment heads east along Lightfighter Drive it runs within the developed Lightfighter Drive and General Jim Moore Boulevard. These roadways are surrounded by a mix of single family residences coast live oak woodland, coyote brush scrub, ice plant mats, and ruderal areas, with some areas of northern coastal scrub.

The pipeline segment between the Highway 1 overcrossing and the Highway 1/Lightfighter Driver interchange is located within the coastal zone. Undeveloped areas within the coastal zone in the City of Marina may be considered primary habitat under the City of Marina LCLUP and ESHA by the CCC. Undeveloped areas within the City of Seaside in the coastal zone may be designated as ESHA by the City of Seaside Local Coastal Program Land Use Plan and by the CCC, and undeveloped areas in the coastal zone and outside of a local coastal plan area, may be considered ESHA by the CCC.

There is one potentially jurisdictional water of the U.S. and/or water of the state within the new Transmission Main study area; an ephemeral drainage located adjacent to the project boundary south of the 8th Street overpass.

Table 4.6-2 lists the special-status species that could potentially occur along the new Transmission Main alignment. Sandmat manzanita was observed in scattered stands through this segment during reconnaissance level surveys conducted for the proposed project in 2013 (ESA, 2013). Monterey spineflower and Kellogg’s horkelia have also been observed along this pipeline alignment (USACE, 1997; Fort Ord Reuse Authority, 2012; CDFW, 2016; and Denise Duffy & Associates, 2013, respectively). Menzies' wallflower, branching beach aster, Monterey Coast paintbrush, Monterey ceanothus, south coast branching phacelia, and Michael's rein orchid were observed within the new Transmission Main alignment during protocol level plant surveys conducted for the proposed project in 2014 (URS, 2014b). Sandmat manzanita was observed in central dune scrub along General Jim Moore Boulevard during botanical surveys in 2016 (AECOM, 2016).

A variety of special-status plant species associated with central dune scrub could occur along this pipeline corridor including robust spineflower, seaside bird's-beak, sand gilia, Hooker's manzanita, Toro manzanita, Pajaro manzanita, ocean bluff milkvetch, Eastwood's goldenbush, northern curly-leaved monardella, and sand-loving wallflower. Coast buckwheat was observed in high densities within the proposed Transmission Main alignment during reconnaissance level surveys conducted in 2013 for the proposed project (ESA, 2013). Therefore, for the purposes of this analysis, it is assumed Smith's blue butterfly could occur along the new Transmission Main alignment.

Salinas kangaroo rat has potential to occur in scrub or chaparral habitat. Black legless lizard, silvery legless lizard, and coast horned lizard could potentially occur within central dune scrub along this alignment. Coast Range newt could occur in oak woodland. Ground squirrels and their burrows were observed in central dune scrub and grassland communities throughout the alignment and western burrowing owl and American badger could occur in these areas. Additionally, raptors such as red-shouldered hawk, red-tailed hawk, white-tailed kite, short-eared owl, northern harrier, American peregrine falcon, and loggerhead shrike could nest and forage within this area. Tricolored blackbird could nest at Locke-Paddon Park in the vicinity of the alignment. Pallid bat has some potential to roost within crevices underneath the Highway 1 overpasses and pallid bat and red bat have potential to roost in trees within the alignment. Northern coastal scrub and coast live oak woodland also provide potential habitat for Monterey dusky-footed woodrat and Monterey shrew.

Carmel Valley Pump Station

The Carmel Valley Pump Station is located near the intersection of Carmel Valley Road and Rancho San Carlos Road. The site includes the proposed pump station, which would be enclosed within a 500-square-foot single-story building, a 100-square-foot electrical control building, as well as the proposed inlet and outlet pipelines that would connect to existing facilities at Carmel Valley Road. The construction footprint for the pump station and associated pipelines is approximately 0.2 acre. The site includes non-native annual grassland, landscaped, and developed areas bordered by coast live oak woodland.

There is a potentially jurisdictional wetland mapped by the NWI within the Carmel Valley Pump Station study area.

Table 4.6-2 lists all potential special-status species with potential to occur at the Carmel Valley Pump Station site. Native stands of Monterey pine may occur in the vicinity of this site. California red-legged frog are known to breed in the Carmel River and small tributaries and backpools in the vicinity of the proposed Carmel Valley Pump Station (CDFW, 2016). This species could use non-native grassland at the site as upland habitat. Coast Range newt could occur in non-native grassland or surrounding woodland. Raptors such as red-tailed hawk, red-shouldered hawk and American kestrel may nest in trees surrounding the site. Loggerhead shrike and common passerines may also nest in trees or shrubs in the site vicinity. Special-status bats have potential to roost in trees surrounding the site and Monterey dusky-footed woodrat may occur in the coast live oak woodland understory.

Ryan Ranch-Bishop Interconnection Improvements

The Ryan Ranch–Bishop Interconnection Improvements site is located along Ragsdale Drive, Lower Ragsdale Drive, and Wilson Road just north of Highway 68. The site is located within an existing road within a business park with existing stands of coast live oak woodland, northern coastal scrub, and non-native grassland interspersed throughout the buildings, roads, parking lots, and landscaping located adjacent to the roadway. The 1.1-mile-long, 8-inch-diameter Ryan Ranch–Bishop Interconnection Improvements pipeline would extend between an existing interconnection at Highway 68 and Ragsdale Avenue and a new connection to the Bishop system. The construction footprint is approximately 7.3 acres. Although the proposed improvements would be constructed within the existing paved roadway, there is one area of non-native grassland adjacent to the road within the project area.

The NWI has mapped a wetland drainage that appears to pass through a culvert underneath Lower Ragsdale Drive near the intersection of Lower Ragsdale Drive and Ryan Court within the Ryan Ranch-Bishop Interconnection Improvements site. This drainage may be considered a water of the U.S./waters of the state.

Table 4.6-2 lists all potential special-status species with potential to occur in the vicinity of the Ryan Ranch-Bishop Interconnection Improvements site. Although most of construction would include work within existing developed roadways, some work would occur in non-native grassland. Furthermore, special-status plant species could occur in coast live oak woodland or non-native grassland adjacent to the roadway including Hickman’s onion, Toro manzanita, Pajaro manzanita, Congdon’s tarplant, Carmel Valley bush-mallow, marsh microseris, Michael’s rein orchid, Santa Cruz microseris, Santa Cruz clover, Pacific Grove clover, and native stands of Monterey pine. Coast Range newt, Monterey dusky-footed woodrat, Monterey shrew, American badger, and special-status bats may also occur in suitable habitat within or adjacent to the Ryan Ranch-Bishop Interconnection Improvements site. Raptors such as red-tailed hawk, red-shouldered hawk, white-tailed kite, American peregrine falcon and American kestrel may forage in the site vicinity and/or nest in nearby oak woodland. California horned lark and common passerines may also forage and/or nest in the non-native grassland, northern coastal scrub, and coyote brush scrub in site vicinity.

Although California tiger salamander breeding habitat is absent from the Ryan Ranch-Bishop Interconnection Improvements site, California tiger salamander breeding ponds exist within 1.2 miles of the Ryan Ranch–Bishop Interconnection Improvements (CDFW, 2016) and this species has potential to occur onsite in the upland grassland. California red-legged frog aquatic habitat is absent from the site. This frog is known to breed within the Carmel River (CDFW, 2016) and could utilize other aquatic sites between the Carmel River and the Ryan Ranch-Bishop Interconnection Improvements site if suitable habitat is present. Due to the presence of several drainages between the Carmel River and the Ryan Ranch-Bishop Interconnection Improvements site, there is a potential for California red-legged frog to occur in the grassland while dispersing.

Main System-Hidden Hills Interconnection Improvements

The Main System-Hidden Hills Interconnection Improvements site is located along Tierra Grande Drive in a low-density residential area north of Carmel Valley Road. The existing interconnection between the main CalAm distribution system and the Hidden Hills system would be improved by installing approximately 1,200 feet of 6-inch-diameter pipeline along the northern extent of Tierra Grande Drive. Additionally, the existing pump capacity at the Upper Tierra Grande Booster Station and the Middle Tierra Grande Booster Station would be upgraded. The construction footprint for the Main System-Hidden Hills Interconnection Improvements is 1.1 acre. The improvements would be constructed within the developed roadway and within the existing Middle Tierra Grande Booster Station, but coast live oak woodland, Monterey pine woodland, and northern coastal scrub are located adjacent to the road edges.

A wetland drainage, mapped by the NWI, is located approximately 600 feet downslope of the majority of the Main System-Hills Interconnection Improvements study area, but appears to run either beneath or adjacent to the Middle Tierra Grande Booster Station. This wetland feature could be considered a water of the U.S./water of the state.

Table 4.6-2 lists all potential special-status species with potential to occur in the vicinity of the Main System-Hidden Hills Interconnection Improvements site. Although most of construction would include work within existing developed roadways, some special-status plant species could occur in coast live oak woodland, non-native grassland, or scrub communities adjacent to the roadway including Yadon's rein orchid, Hickman's onion, Hooker's manzanita, Toro manzanita, Pajaro manzanita, sandmat manzanita, Congdon's tarplant, Eastwood's golden bush, Carmel Valley bush-mallow, marsh microseris, Santa Cruz microseris, Michael's rein orchid, Santa Cruz clover, Pacific Grove clover, and native stands of Monterey pine. Raptors such as red-tailed hawk, red-shouldered hawk and loggerhead shrike may forage and nest in the vicinity of the interconnection improvement site. Coast Range newt, Monterey dusky-footed woodrat, Monterey shrew, American badger, and special-status bats may also occur in suitable habitat adjacent to this Interconnection Improvements site.

California red-legged frog aquatic habitat is absent from the Main System-Hidden Hills Interconnection Improvements site. This frog is known from the Carmel River, approximately 1 mile south of the site, and from artificial ponds located within the Tehama Golf Course approximately 2 miles northwest of the site (CDFW, 2016). Due to the presence of several drainages between the Carmel River and the Main System-Hidden Hills Interconnection Improvements site, there is a potential for California red-legged frog to occur in upland areas adjacent to the site, but would not be expected to utilize the facility site as it is developed. Stock ponds that could potentially support California tiger salamander are located within 1.2 miles of the site. If California tiger salamander are present in these ponds, they have potential to disperse through upland areas adjacent to the site.

Staging Areas

There are eight staging areas located throughout the project area. **Table 4.6-3** below lists the location of each staging area, a description of the site, size of the site, habitat types present, and the special-status species that occur or have potential to occur within or adjacent to the staging areas. **Table 4.6-2** lists all of the special-status species with potential to occur within the staging areas. The majority of the staging areas are located within developed or highly disturbed areas; however, some are located adjacent to undisturbed habitat. Additionally, the proposed staging area on the west side of General Jim Moore Boulevard, near Seaside Middle School, in Seaside, does contain northern coastal scrub and coyote brush scrub communities. None of the staging areas contain potentially jurisdictional waters of the U.S./waters of the state within or adjacent to the study area.

The staging area at Beach Road in Marina is within the coastal zone and undeveloped areas within the staging area may be considered primary habitat under the City of Marina LCLUP and ESHA by the CCC.

4.6.2 Regulatory Framework

This section provides an overview of notable federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as "regulatory requirements") relevant to terrestrial biological resources. A brief summary of each is provided, along with a finding regarding the project's consistency with those regulatory requirements. The consistency findings concern the project as proposed, without mitigation. Where the proposed project would be consistent with the applicable regulatory requirement, no further discussion of consistency with that regulatory requirement is provided. Where the proposed project would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to a specific impact discussion in Section 4.6.5, Direct and Indirect Effects of the Proposed Project, below, where the potential inconsistency is addressed in more detail. The regulatory framework for surface water hydrology and water quality and marine biological resources are described in Sections 4.3.2 and 4.5.2, respectively.

4.6.2.1 Federal Regulations

Federal Endangered Species Act (FESA)

The USFWS (jurisdiction over terrestrial and freshwater aquatic species) and National Marine Fisheries Service (NMFS; jurisdiction over most anadromous and marine fish, and mammals) oversee the FESA. The FESA prohibits the "take"[12] of any fish or wildlife species listed as threatened or endangered, including the destruction of habitat that could hinder species recovery. Section 7 of the Act mandates that a federal agency undertaking funding, issuing a permit or

[12] The definition of "take" pursuant to the FESA is to "harass, harm, pursue, hunt, shoot, wound, trap, capture, or collect, or to attempt to engage in any such conduct." The USFWS has also interpreted "harm" to include significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife. NMFS has defined harm to mean "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering." 50 CFR 222.102.

TABLE 4.6-3
CONSTRUCTION STAGING AREAS, HABITAT TYPES, AND SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR

Location	Site Description	Staging Area Footprint (acre)	Habitat Types Present in Study Area	Special-Status Species with Potential to Occur within or Adjacent to the Staging Areas
Monte Road/ Neponset Road in unincorporated Monterey County	Paved parking lot (semi-trucks) at Dole Vegetable Processing Plant	0.7	Developed/ Landscaped, Ice Plant Mats, Ruderal	Habitat for California tiger salamander, California red-legged frog, Coast Range newt, black legless lizard, and silvery legless lizard occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent buildings and trees. Branching beach aster and Monterey spineflower documented in nearby central dune scrub.
Beach Road in Marina	Paved parking lot at Walmart	0.4	Developed/ Landscaped, Ruderal, Ice Plant Mats, Non-native Annual Grassland	Habitat for Salinas kangaroo rat, black legless lizard, silvery legless lizard, coast horned lizard, and Coast Range newt occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees. Branching beach aster documented in nearby central dune scrub.
Highway 1/1st Street in Marina	Gated paved parking lot	1.2	Developed/ Landscaped, Ice Plant Mats	Habitat for black legless lizard, silvery legless lizard, and coast horned lizard occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees. Monterey spineflower, coast buckwheat and branching beach aster documented in nearby central dune scrub. Smith's blue butterfly may occur in vicinity.
2nd Avenue, between Lightfighter Drive and Divarty Street, in Seaside	Paved parking lot at the Cal State University at Monterey Bay Athletic Fields	3.2	Developed/ Landscaped, Ruderal, Ice Plant Mats	Habitat for black legless lizard, silvery legless lizard, and coast horned lizard occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees. Landscaped manzanita observed at the site during ESA's reconnaissance survey.
2nd Avenue/ Lightfighter Drive in Seaside	Paved parking lot.	0.5	Developed/ Landscaped, Ruderal, Central Dune Scrub	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and other special-status species with potential to occur in central dune scrub occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees
West side of General Jim Moore Boulevard, near Gigling Road, in Seaside	Paved parking lot	0.3	Developed/ Landscaped, Coast Live Oak Woodland	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and Coast Range newt occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees.
East side of General Jim Moore Boulevard, near Gigling Road, in Seaside	Paved parking lot	0.2	Developed/ Landscaped, Ice Plant Mats, Ruderal, Coast Live Oak Woodland	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and Coast Range newt occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees and buildings. Monterey spineflower documented in nearby central dune scrub (AECOM, 2016).
West side of General Jim Moore Boulevard, near Seaside Middle School, in Seaside	Sandy area	0.1	Northern Coastal Scrub, Ice Plant Mats, Coyote Brush Scrub, Developed/ Landscaped	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and Monterey shrew occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees and buildings. Monterey spineflower and branching beach aster (AECOM, 2016) documented in nearby central dune scrub. Monterey ceanothus documented within survey area (AECOM, 2016) and confirmed to be located on vegetated shoulder of paved area by ESA during reconnaissance surveys.

authorization, or carrying out an activity consult with the USFWS and, or NMFS, depending on the affected species, to ensure that federal agency actions do not jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat for listed species. The federal agency is required to consult with the USFWS and NMFS if it determines the proposed project "may affect" listed species or critical habitat. During consultation, the potential for take would be determined and, if take is expected to occur, the necessary conditions to allow the issuance of an incidental take authorization would be imposed. As indicated in **Table 3-8** in Chapter 3, Description of the Proposed Project, consultation with the USFWS and NMFS is required for regulatory permits and approvals.

The proposed project has potential to result in take of federally threatened or endangered species, which would be inconsistent with FESA. This inconsistency is addressed under Impact 4.6-1 (*Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification, during construction*) and Impact 4.6-6 (*Result in substantial adverse effects on candidate, sensitive, or special-status species during project operations*).

Federal Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) affirms, or implements, a commitment by the United States to four international conventions (with Canada, Mexico, Japan, and Russia) for the protection of a shared migratory bird resource. The MBTA makes it unlawful to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, . . . or any part, nest, or egg of any such bird" (16 USC § 703) anywhere in the United States.

The proposed project has potential to result in the removal of nests occupied by migratory birds or in other impacts on migratory birds, which would be inconsistent with the MBTA. This inconsistency is addressed under Impact 4.6-1 (*Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification, during construction*) and Impact 4.6-6 (*Result in substantial adverse effects on candidate, sensitive, or special-status species during project operations*).

U.S. Army Corps of Engineers and U.S. Environmental Protection Agency

Wetlands and other waters (e.g., rivers, streams, and natural ponds) are a subset of "waters of the U.S.," and receive protection under Section 404 of the Clean Water Act (CWA). The USACE has primary federal responsibility for administering regulations that concern waters of the United States. In this regard, the USACE acts under two statutory authorities: the Rivers and Harbors Act (Sections 9 and 10), which governs specified activities in "navigable waters,"[13] and the Clean Water Act (Section 404), which governs specified activities in waters of the United States, including wetlands. The construction of structures, such as tidegates, bridges, and piers, as well as

[13] Navigable waters are defined as those waters that are subject to the ebb and flow of the tide or that are presently used, have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

construction activities that could interfere with navigation, such as dredging and stream channelization, may require a Section 10 permit. A Section 404 permit is required if the activity involves the discharge of fill into waters of the U.S. The United States Environmental Protection Agency (USEPA) has the ultimate authority for designating dredge and fill material disposal sites and can veto the Corp's issuance of a permit to fill jurisdictional waters of the United States.

The USACE requires a permit if a project proposes placement of structures within navigable waters and/or alteration of waters of the U.S. Some classes of fill activities may be authorized under Regional General or Nationwide permits if specific conditions are met. Nationwide permits do not authorize activities that are likely to jeopardize the existence of a threatened or endangered species (listed or proposed for listing under the FESA). The Nationwide permit outlines general conditions and may specify project-specific conditions as required by the USACE during the Section 404 permitting process. When a project's activities do not meet the conditions for a Nationwide Permit, an Individual Permit may be issued by the USACE.

The federal government also supports a policy of minimizing "the destruction, loss, or degradation of wetlands." Executive Order 11990 (May 24, 1977) requires that each federal agency take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

Several Supreme Court cases have challenged the scope and extent of the USACE's jurisdiction over waters of the United States and have led to several reinterpretations of that authority. The most recent of these decisions are the case of *Solid Waste Agency of Northern Cook County (SWANCC) v. the Army Corps of Engineers* (January 9, 2001) and *Rapanos v. United States* (June 2006). The SWANCC decision found that jurisdiction over non-navigable, isolated, intrastate waters could not be based solely on the use of such waters by migratory birds. The reasoning behind the SWANCC decision could be extended to suggest that waters need a demonstrable connection with a navigable water to be protected under the CWA. The introduction of the term "isolated" has led to the consideration of the relative connectivity between waters and wetlands as a jurisdictionally relevant factor. The Rapanos case further questioned the definition of "waters of the United States" and the scope of federal regulatory jurisdiction over such waters but resulted in a split decision which did not provide definitive answers but expanded on the concept that a "significant nexus" with traditional navigable waters was needed for certain waters to be considered within the jurisdiction of the USACE.

On June 5, 2007 the USEPA and the USACE released guidance on CWA jurisdiction in response to the Rapanos Supreme Court decision, which can be used to support a finding of CWA coverage for a particular water body when either a) there is a significant nexus between the stream or wetland in question and navigable waters in the traditional sense; or b) a relatively permanent water body is hydrologically connected to traditional navigable waters and/or a wetland has a surface connection with that water. According to this guidance the USACE and the USEPA will take jurisdiction over the following waters:

1. Traditional navigable waters, which are defined as all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

2. Wetlands adjacent to traditional navigable waters; including adjacent wetlands that do not have a continuous surface connection to traditional navigable waters;
3. Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months);
4. Wetlands adjacent to non-navigable tributaries as defined above; that have a continuous surface connection to such tributaries (e.g. they are not separated by uplands, a berm, dike, or similar feature).

The USEPA and the USACE retain jurisdiction over the following waters, based on a fact-specific determination of significant nexus, as defined below, to a traditional navigable water: non-navigable tributaries that are not relatively permanent; wetlands adjacent to non-navigable tributaries that are not relatively permanent; and wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

The USEPA and the USACE *generally* do not assert jurisdiction over the following features: swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow); ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

The USEPA and the USACE have defined the significant nexus standard as follows:

1. A significant nexus analysis assesses the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters;
2. Significant nexus analysis includes consideration of hydrologic and ecologic factors including:
    a. volume, duration, and frequency of flow, including consideration of certain physical characteristics of the tributary;
    b. proximity to a traditional navigable water;
    c. size of the watershed;
    d. average annual rainfall;
    e. average annual winter snow pack;
    f. potential of tributaries to carry pollutants and flood waters to traditional navigable waters;
    g. provision of aquatic habitat that supports a traditional navigable water;
    h. potential of wetlands to trap and filter pollutants or store flood waters; and
    i. maintenance of water quality in traditional navigable waters.

The proposed project has potential to result in fill of wetlands or other waters regulated under Section 404 of the CWA or activities in, over, or under navigable waters regulated under Section 10 of the Rivers and Harbors Act, which would be inconsistent with each of these regulations. This inconsistency is addressed under Impact 4.6-3 (*Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during construction*) and Impact 4.6-8 (*Result in substantial adverse effects on federal wetlands, federal other waters, and waters of the state during project operations*).

Federal Policies on Riparian Communities in California

Riparian communities are associated with water and have a variety of functions, including providing high-quality habitat for resident and migrant wildlife, streambank stabilization, and runoff water filtration. Throughout the United States, riparian habitats have declined substantially in extent and quality compared with their historical distribution and condition. These declines have increased concerns about dependent plant and wildlife species, leading federal agencies to adopt policies to arrest further loss. USFWS Mitigation Policy identifies California's riparian habitats as belonging to resource Category 2, for which "no net loss" of existing habitat value is recommended (USFWS, 1981).

The proposed project has potential to result in loss of riparian habitat, which would be inconsistent with the USFWS Mitigation Policy. This inconsistency is addressed under Impact 4.6-2 (*Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during construction*) and Impact 4.6-7 (*Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during project operations*).

Executive Order 13112: Prevention and Control of Invasive Species

Enacted in February 1999, Executive Order (EO) 13112 calls for federal agencies to prevent and control the introduction of invasive species in a cost-effective and environmentally sound manner. This includes consideration of the potential effects of invasive species in NEPA analyses. The EO established an Invasive Species Council comprised of federal agencies and headed by the Secretary of the Interior with the responsibility to oversee implementation of the executive order.

The proposed project has potential to result in the introduction and spread of invasive species, which would be inconsistent with the EO. This inconsistency is addressed under Impact 4.6-5 (*Introduce or spread an invasive non-native species during construction*) and Impact 4.6-9 (*Introduce or spread an invasive non-native species during operations*).

Integrated Natural Resource Management Plan, Presidio of Monterey and Ord Military Community

The Integrated Natural Resource Management Plan (INRMP) for the Presidio of Monterey and Ord Military Community (OMC) has been prepared in accordance with Army Regulation (AR) 200-3 and the Guidelines to Prepare Integrated Natural Resources Management Plans for Army Installations and Activities. For the OMC, the INRMP covers only those lands being permanently retained by the Army. Land areas identified for civilian reuse, the former Fort Ord, are not included in the INRMP. The INRMP is intended to be a component and supporting element of the Installation Master Plan.

The INRMP contains guidelines for land management with regard to landscaping, maintenance, irrigation, fertilization, and pest control. The Lead Agencies anticipate that the U.S. Army will require compliance with the applicable INRMP policies and guidelines in permits and/or other agreements obtained by CalAm for the ASR facilities within U.S. Army-owned land.

4.6.2.2 State Regulations

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) provides for the long-term management of lands within California's coastal zone boundary, as established by the Legislature and defined in Coastal Act. Of primary relevance to terrestrial biological resources are Coastal Act policies concerning ESHAs and adjacent developments, and diking, filling, or dredging and continued movement of sediment and nutrients. A preliminary assessment of project consistency with these priorities is provided here. Final determinations regarding project consistency are reserved for the Coastal Commission.

With respect to Coastal Act policies related to ESHA and the diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes, the proposed project would be potentially inconsistent. These potential conflicts are addressed in Impact 4.6-2 (*Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during construction*), Impact 4.6-3 (*Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during construction*), Impact 4.6-7 (*Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during project operations*), and Impact 4.6-8 (*Result in substantial adverse effects on federal wetlands, federal other waters, and waters of the state during project operations*).

California Endangered Species Act

California implemented its own Endangered Species Act (CESA) in 1984. The state act prohibits the take[14] of state listed endangered and threatened species; however, habitat destruction is not included in the state's definition of take. Section 2090 of CESA requires state agencies to comply with endangered species protection and recovery and to promote conservation of these species. The CDFW administers the act and authorizes take through Section 2081 agreements (except for designated fully-protected species, as described under the heading, California Fish and Game Code, below). Under CCR Title 14, Section 786.9(b), CDFW can also approve the take of state rare plants under Section 2081.

The proposed project has potential to result in take of state threatened or endangered species, or a rare plant, which would be inconsistent with CESA. This inconsistency is addressed under Impact 4.6-1 (*Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification, during construction*) and

[14] Take, under the CESA, is defined as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

Impact 4.6-6 (*Result in substantial adverse effects on candidate, sensitive, or special-status species during project operations*).

California Fish and Game Code

Section 2080 of the California Fish and Game Code states that "No person shall import into this state [California], export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the Commission [State Fish and Game Commission] determines to be an endangered species or threatened species, or attempt any of those acts, except as otherwise provided in this chapter, or the Native Plant Protection Act, or the California Desert Native Plants Act." Pursuant to Section 2081 of the code, CDFW may authorize individuals or public agencies to import, export, take, or possess state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or Memoranda of Understanding if the take is incidental to an otherwise lawful activity, impacts of the authorized take are minimized and fully mitigated, the permit is consistent with any regulations adopted pursuant to any recovery plan for the species, and the project operator ensures adequate funding to implement the measures required by CDFW, which makes this determination based on available scientific information and considers the ability of the species to survive and reproduce.

Additionally, as described in CCR Title 14, Section 786.9, CDFW may also permit take of state rare plants under the same conditions as take authorizations issued pursuant to Section 2081 of the Fish and Game Code.

Under Section 3503 of the California Fish and Game Code, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 of the California Fish and Game Code prohibits take, possession, or destruction of any birds in the orders Falconiformes (hawks)[15] or Strigiformes (owls), or of their nests and eggs.

California Fish and Game Code Sections 3511 [birds], 4700 [mammals], 5050 [reptiles and amphibians] and 5515 [fish] allows the designation of a species as Fully Protected. This is a greater level of protection than is afforded by the CESA, since such a "Fully Protected" designation means the listed species cannot be taken at any time.

Under the California Fish and Game Code Sections 1900-1913 the California Native Plant Protection Act (NPPA) requires all state agencies to use their authority to carry out programs to conserve endangered and rare native plants. Provisions of the NPPA prohibit the taking of listed plants from the wild and require notification of CDFW at least 10 days in advance of any change in land use. This allows CDFW to salvage listed plant species that would otherwise be destroyed. The project operator is required to conduct botanical inventories and consult with CDFW during

[15] At the time Section 3503.5 was written, the order Falconiformes included diurnal birds of prey in the families Accipitridae (eagles, hawks, kites, harriers and others) and Falconidae (falcons and caracaras). In 2010, Accipitridae was placed in a new order, Acciptriformes, by the North American Classification Committee (NACC). However, for the purposes of this report, we interpret the reference to the order Falconiformes in Section 3503.5 to also include diurnal birds of prey in the order Accipitriformes.

project planning to comply with the provisions of this act and sections of CEQA that apply to rare or endangered plants.

The proposed project has potential to result in take or other impacts on plants or wildlife protected under California Fish and Game Code, which would be inconsistent with California Fish and Game Code. This inconsistency is addressed under Impact 4.6-1 (*Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification, during construction*) and Impact 4.6-6 (*Result in substantial adverse effects on candidate, sensitive, or special-status species during project operations*).

CEQA Guidelines Section 15380

Although threatened and endangered species are protected by specific federal and state statutes, CEQA Guidelines section 15380 provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in the FESA and the section of the California Fish and Game Code dealing with rare or endangered plants or animals. This section was included in the Guidelines primarily to deal with situations in which a public agency is reviewing a project that may have a significant effect on, for example, a "candidate species" that has not yet been listed by either the USFWS or CDFW. Thus, CEQA provides an agency with the ability to protect a species from a project's potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

As described in Section 4.6.1.8 Special-Status Species, for the purposes of this EIR/EIS "special-status species" includes those that may be considered rare or endangered pursuant to Section 15380 of the CEQA Guidelines (these include plant species with CRPR of 1, 2, 3, or 4 and candidate species).

As Section 15380 provides a definition of special-status species, the project would be consistent with this guideline. As described in other regulatory discussions for FESA, MBTA, CESA, and California Fish and Game Code, the project would be inconsistent with these other regulations that protect special-status species. These inconsistencies are addressed under Impact 4.6-1 (*Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification, during construction*) and Impact 4.6-6 (*Result in substantial adverse effects on candidate, sensitive, or special-status species during project operations*).

State Regulation of Waters Including Wetlands

Regional Water Quality Control Board

Under Section 401 of the CWA, the RWQCB must certify that actions receiving authorization under Section 404 of the CWA also meet state water quality standards. The RWQCB also regulates waters of the state under the Porter-Cologne Act Water Quality Control Act (Porter-Cologne Act). Under the Porter-Cologne Act, the RWQCB must prepare and periodically update water quality control basin plans. Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control nonpoint and point sources of pollution to achieve and maintain these standards. Projects that affect wetlands or waters of the state must meet waste discharge requirements of the RWQCB, which may be issued in addition to a water quality certification or waiver under Section 401 of the CWA.

The RWQCB requires projects to avoid impacts on wetlands if feasible and requires that projects do not result in a net loss of wetland acreage or a net loss of wetland function and values. In addition California defines wetlands by presence of one or more of the following three attributes in addition to wetland hydrology:

- At least periodically, the land supports predominantly hydrophytes (at least 50 percent of the aerial vegetative cover);
- The substrate is predominantly undrained hydric soil; and
- The substrate is not soil (such as a rocky shore) and is saturated with water or covered by shallow water at some time during the growing season of each year.

Under normal circumstances, the federal definition of wetlands requires all three wetland identification parameters to be met, whereas the California definition requires the presence of at least one of these parameters. For this reason, identification of wetlands by state agencies consists of the union of all areas with a non-soil substrate that are periodically inundated or saturated, or in which at least seasonal dominance by hydrophytes may be documented, or in which hydric soils are present.

The state issued the California Wetlands Conservation Policy (Executive Order W-59-93), commonly referred to as the "No Net Loss Policy" for wetlands. The Order aims to ensure no overall net loss, and long-term net gain in the quality, quantity, and performance of wetlands in California.

The proposed project has potential to result in fill of waters or wetlands regulated under Section 401 of the CWA and waters regulated under the Porter-Cologne Act, which would be inconsistent with each of these regulations. This inconsistency is addressed under Impact 4.6-3 (*Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during construction*) and Impact 4.6-8 (*Result in substantial adverse effects on federal wetlands, federal other waters, and waters of the state during project operations*).

California Department of Fish and Wildlife

Under Sections 1600-1616 of the California Fish and Game Code, the CDFW regulates activities that would substantially divert, obstruct the natural flow of, or substantially change rivers, streams and lakes. CDFW's jurisdictional limits are defined in Section 1602 of the California Fish and Game Code as, "bed, channel, or bank of any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake…." The CDFW requires a Streambed Alteration Agreement for activities within its jurisdictional area. If CDFW determines that a project would result in substantial adverse effects on an existing fish or wildlife resource, CDFW would prepare a Lake or Streambed Alteration Agreement that includes reasonable measures to protect the resources.

The proposed project has potential to result in impacts on rivers or streams, which would be inconsistent with Sections 1600-1616 of the California Fish and Game Code. This inconsistency is addressed under Impact 4.6-3 (*Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during construction*), Impact 4.6-2 (*Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during construction*), Impact 4.6-7 (*Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during project operations*), and Impact 4.6-8 (*Result in substantial adverse effects on federal wetlands, federal other waters, and waters of the state during project operations*).

Provisions and Policies Applying to Sensitive Communities in both Wetlands and Uplands

California Coastal Commission

The California Coastal Commission (CCC), in partnership with coastal cities and counties, plans and regulates the use of land and water in the coastal zone under the California Coastal Act (Coastal Act). On land the coastal zone varies in width from several hundred feet in highly urbanized areas to five miles in certain rural areas. Offshore the coastal zone encompasses a 3-mile-wide band of ocean. Development activities are broadly defined by the Coastal Act to include: the construction of buildings and structures, divisions of land, and activities that change the intensity of use of land or public access to coastal waters. A development activity within the coastal zone generally requires a coastal development permit from either the CCC, or from a local government with a certified Local Coastal Program (LCP), to ensure that the activity complies with the Coastal Act. The Coastal Act includes goals and policies that constitute the statutory standards that are applied to planning and regulatory decisions made by the CCC and by local governments.

The Coastal Act defines ESHAs as "any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments" (Pub. Res. Code §30107.5). The CCC generally treats wetlands, streams, riparian habitats, and open coastal waters as ESHAs, although exceptions may exist where the definition of ESHA is not satisfied. Because the CCC typically defines wetlands based on a "one-parameter approach" CCC jurisdictional wetlands are typically greater in extent than those regulated by the USACE under the CWA. An ESHA may also be found in upland areas, for example stands of large, mature trees in an area otherwise lacking such habitat.

The principal Coastal Act policy pertaining to ESHAs is PRC Section 30240, which provides: "Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas."

As discussed in connection with wetlands, above, the ESHA policy is applied by the CCC or by local agencies with approved LCPs. LCPs within the project area utilize the Coastal Act definition for ESHAs and some LCPs include additional guidance to determine ESHA boundaries within their respective LCP area.

The proposed project has potential to result in impacts on wetlands or ESHA regulated by the CCC, which would be inconsistent with the Coastal Act. This inconsistency is addressed under Impact 4.6-2 (*Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during construction*), Impact 4.6-3 (*Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during construction,* Impact 4.6-7 (*Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during project operations*), and Impact 4.6-8 (*Result in substantial adverse effects on federal wetlands, federal other waters, and waters of the state during project operations*).

Habitat Management and Conservation Plans

1997 Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California

The USACE developed a multispecies Habitat Management Plan for the former Fort Ord as a mitigation measure for impacts on vegetation and wildlife resources resulting from pre-disposal, disposal, and reuse actions, such as hazardous materials remediation. The 1997 Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California (HMP; USACE, 1997) addresses those potential impacts and promotes preservation, enhancement, and restoration of habitat and populations of HMP covered species, while allowing development on selected properties.

For the most part, the proposed project will not occur in lands covered under the HMP. The exception to this would be the construction of the new Transmission Main, and Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline).

2012 Draft Installation-Wide Multispecies Habitat Conservation Plan for Former Fort Ord

FORA is preparing a Draft Habitat Conservation Plan for the former Fort Ord military base entitled *Draft Installation-Wide Multispecies Habitat Conservation Plan* (Draft HCP; Fort Ord Reuse Authority, 2012). The Draft HCP provides a framework for ensuring conservation and enhancement of 19 special-status plant and animal species and the natural communities that support them on the former Fort Ord military base that would contribute to species recovery and is based on the HMP described above. Once finalized, the HCP will serve as the basis for issuance of a base-wide Section 2081 (CESA) incidental take permit by CDFW and also as the basis for issuance of a base-wide Section 10(a)(1)(B) (FESA) incidental take permit by the USFWS. The Draft HCP incorporates all relevant information from the HMP described above issued by the USACE in April 1997, and, once finalized, will supersede it as the primary conservation planning document for non-federal recipients of the former Fort Ord lands.

Once finalized, the HCP will accompany applications to CDFW and USFWS for incidental take of species addressed in the HCP. USFWS will consider issuance of permits for all HCP wildlife species but CDFW can only issue permits for state-listed or candidate species. Upon approval of the applications, including the HCP and other supporting documentation, permits will be issued for a term of 50 years. The most recent HCP draft was prepared in March 2015. FORA received comments from Permittees and wildlife agencies on the draft HCP in 2016. The final adoption date has not been determined.

Similar to the HMP, the majority of the proposed project will not occur in lands covered under the HCP. The exception to this would be the construction of the new Transmission Main, and proposed ASR facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline).

4.6.2.3 Applicable Regional and Local Land Use Plans and Policies

Table 4.6-4 identifies the regional and local land use plans, policies, and regulations pertaining to inland biological resources that are relevant to the MPWSP and that were adopted for the purpose of avoiding or minimizing an adverse environmental effect. Also included in Table 4.6-4 is an analysis of project consistency with such plans, policies, and regulations. Where the analysis concludes the proposed project would be consistent with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes the proposed project would be potentially inconsistent with the applicable plan, policy, or regulation, the reader is referred to Section 4.6.5, Direct and Indirect Effects of the Proposed Project. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

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TABLE 4.6-4
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Land Use – Primary Policies	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 2.4.4:*** Wherever possible, lands with significant agricultural, natural habitat, or scenic value shall be retained and protected from degradation.	This policy is intended to preserve and protect sensitive natural communities.	Potentially Inconsistent: Installation of the subsurface slant wells, New Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main, and maintenance of the subsurface slant wells would occur within sensitive natural communities. This issue is addressed further in Impacts 4.6-2 and 4.6-7 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.112***: The policies of the Community Land Use Element are designed to protect areas with significant agricultural or natural-habitat value from being displaced by development, and they are designed to protect and conserve air, water and energy resources.	This policy is intended to protect important agricultural, biological, air, water, and energy resources from impacts of development.	Potentially Inconsistent: Installation of the subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main, and maintenance of the subsurface slant wells would occur within and could disrupt sensitive natural communities (which may include wetlands and waters) and sites supporting special-status species. This issue is addressed further in Impacts 4.6-1, 4.6-2, 4.6-3, 4.6-6, 4.6-7, and 4.6-8 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.114:*** Within areas identified as supporting sensitive habitat(s), the following requirements shall apply: 1. With the exceptions of areas where an approved Habitat Management Program (HMP) or Habitat Conservation Program (HCP) allows development without restrictions, and for structures erected to maintain, restore or enhance sensitive habitat and species, require discretionary approval for all new structural and road development proposed within sensitive habitat areas or on sites supporting sensitive species and habitat. 2. Site and design those new structures or roads which may be allowed within designated Habitat Reserves or other identified sensitive habitat areas so as to minimize adverse impacts upon habitat areas. This may entail site plan modification and/or the inclusion of appropriate mitigation measures developed by biologists, soils engineers, or hydrologists (e.g., erosion and storm-drainage controls, wildlife culverts, and grading limitations). (2006-243)	This policy is intended to protect sensitive natural communities (which may include wetlands and waters) and sites supporting special-status species.	Potentially Inconsistent: Installation of the subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main, and maintenance of the subsurface slant wells would occur within, and could disrupt, sensitive natural communities (which may include wetlands and waters) and sites supporting special-status species. This issue is addressed further in Impacts 4.6-1, 4.6-2, 4.6-3, 4.6-6, 4.6-7, and 4.6-8 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.115:*** Within areas for which there is an approved (HMP) or (HCP) and where avoidance of significant impacts is not feasible as determined through discretionary review, a seasonal avoidance and/or salvage/relocation program for certain species and habitat areas should be established or undertaken, as appropriate, prior to site development.	This policy is intended to protect special-status species and sensitive natural communities within areas where there is an approved HMP or HCP.	Potentially Inconsistent: There are no approved HMPs or HCPs that cover the sites of the proposed subsurface slant wells, Source Water Pipeline, and new Desalinated Water Pipeline. However, the new Transmission Main is located within an approved HMP. Installation of the Transmission Main could disrupt special-status species and sensitive natural communities in an approved HMP area. This issue is further addressed in Impacts 4.6-1, 4.6-2, and 4.6-10.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.116:*** Where new development may remove all or a portion of identified sensitive habitat in an area not subject to an approved HMP or HCP, and where no less environmentally damaging alternative can be feasibly implemented, comparable habitat should be restored either onsite or offsite on a two-to-one basis (e.g., two acres of habitat shall be restored for every acre of habitat removed).	This policy is intended to protect sensitive natural communities (which may include wetlands and waters) in areas not subject to an approved HMP or HCP.	Potentially Inconsistent: Installation of the subsurface slant wells, Source Water Pipeline, and new Desalinated Water Pipeline, and maintenance of the subsurface slant wells would occur within, and could disrupt, sensitive natural communities (which may include wetlands and waters) outside of an approved HMP. This issue is addressed further in Impacts 4.6-2, 4.6-3, 4.6-7, and 4.6-8 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.118:*** Where development sites are adjacent to areas designated as "Habitat Reserves" or other identified sensitive areas, site improvements and buildings shall be located and designed so as to avoid adverse impacts on the biological resource in question. Development shall be conditioned upon the incorporation of adequate mitigation measures in terms of site design. Such measures might include the following: a) providing an adequate buffer between new development and identified sensitive habitat; b) minimizing the need for grading that would substantially alter the existing topography; c) incorporating erosion- and sediment-control techniques during and after construction; d) establishing appropriate native landscaping between new development and sensitive habitat; and e) providing wildlife corridors or connections between the sensitive habitat and other natural open space areas.	This policy is intended to protect areas designated as Habitat Reserves" or other sensitive natural communities (which may include wetlands and waters).	Potentially Inconsistent: The subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main are proposed for sites in or adjacent to areas designated as "Habitat Reserves and Other Open Space." These Habitat Reserves are comprised of sensitive natural communities (which may include wetlands and waters). Installation of these facilities and maintenance of the subsurface slant wells could disrupt such communities. This issue is addressed further in Impacts 4.6-1, 4.6-2, 4.6-3, 4.6-6, 4.6-7, and 4.6-8 and mitigation measures are provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.119:*** As part of any application package for development proposed on undeveloped lands in former Fort Ord or on the Armstrong Ranch, seasonally timed surveys for known or suspected sensitive or unique species and habitats shall be undertaken by a qualified biologist approved by the City Community Development Director (except in those areas where such species have already been addressed by approved habitat conservation/management plans or similar plans or agreements). This information shall be provided as part of a preliminary site and development review, and, for development on former Fort Ord, should be submitted to CRMP for review and recommendations. Where such species are found to occur, mitigation plans (or Habitat Management Plans) shall be prepared in coordination with the USFWS and CDFW unless approved habitat management plans are already in place.	This policy is intended to identify and protect special-status species and sensitive natural communities (which may include wetlands and waters) on undeveloped lands in former Fort Ord and on the Armstrong Ranch.	<u>Potentially Inconsistent:</u> Installation of the new Transmission Main would occur on undeveloped lands within the former Fort Ord that potentially support special-status species and sensitive natural communities (which may include wetlands and waters). Surveys to identify presence of these species, and then avoid impacts on these species, are not included as part of the proposed project. This issue is addressed further in Impacts 4.6-1, 4.6-2 and 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.120:*** Oak woodland shall be protected to the greatest extent possible in recognition both of its relatively high biological and aesthetic resource value and its important role in California's and Monterey County's natural heritage. In areas supporting oak woodland, a site survey of this resource should be completed for all new subdivisions and commercial projects as part of a preliminary site and development review. All stands of oak woodland and individual specimens with a diameter of 6 inches or more when measured 4.5 feet from ground level should be identified on a base map. To the greatest extent possible, development plans shall then attempt to incorporate the oak woodland or individual specimens into the plan as an integral feature of the natural and built environment. All oak trees shall be replaced and maintained with new trees of the same stock as those found onsite or in the site vicinity according to the following replacement formula: a minimum one-for-one (one replacement tree for each tree removed) where replacement trees are proposed to be the same diameter or greater than those to be removed; a minimum three-to-one (three replacement trees for each tree removed) for replacement trees of lesser diameter than those proposed for removal, unless, as determined by arborist, the site's specific environmental conditions would not sufficiently support a healthy oak habitat. All diameter measurements shall be taken at 4.5 feet from ground level. Replacement trees shall be a mixture of sizes.	This policy is intended to protect oak woodlands and individual oak trees.	<u>Potentially Inconsistent:</u> Oak woodlands do not occur within the sites of the proposed subsurface slant wells, Source Water Pipeline, or new Transmission Main within the City of Marina. However, a tree survey has not been conducted at these sites and individual oak trees could occur within the Source Water Pipeline and new Transmission Main and be removed during construction. This issue is addressed further in Impact 4.6-4 and a mitigation measure is provided to reduce or avoid any impacts. Oak woodland occurs within the new Desalinated Water Pipeline. Oak woodlands and individual oak trees could be removed during construction of these facilities. This issue is addressed further in Impacts 4.6-2 and 4.6-4 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.121:*** In those areas where the potential for vernal pools exists, a site survey shall be conducted by a qualified biologist. Any development or grading of a site found to have one or more vernal pools shall provide a wetland buffer of sufficient width and size, as determined by a qualified biologist, between the vernal pond habitat, including associated wetland vegetation, and the proposed or existing development to both protect those species most sensitive to development disturbances and complement the habitat value of the wetland resource. Structures allowed within the wetland buffer shall be limited to those required for providing public access and nature observation. Grading within identified vernal ponds shall be limited to that necessary for habitat restoration, enhancement and protection or as may otherwise be recommended by a qualified biologist. No soil disturbance shall occur during the rainy season within the designated vernal pond and buffer area. Grading within the drainage area of vernal ponds but outside the designated wetland buffer may be allowed in accordance with the provisions of an approved erosion control and landscape plan pursuant to Policy 4.125.1 of this plan with appropriate measures employed as needed to protect the wetland habitat.	This policy is intended to protect wetlands classified as vernal pools and/or vernal ponds.	<u>Potentially Inconsistent:</u> Vernal ponds (including the pond associated with Locke-Paddon Park) occur in the vicinity of the proposed new Desalinated Water Pipeline alignment and could be adversely affected by pipeline construction. This issue is addressed further in Impacts 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.122:*** The City shall require that lighting of streets and other public areas in proximity to areas of natural open space be shielded and as unobtrusive as possible so as to direct light away from habitat reserve areas and other areas of natural open space. The same requirements shall follow for outdoor lighting on private development sites adjacent to such lands.	This policy is intended to protect sensitive natural habitats and species from impacts of nighttime lighting.	*MPWSP consistency with plans, policies, and ordinances related to nighttime lighting is presented Section 4.14, Aesthetic Resources.*
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Land Use	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 2.10:*** Lands designated as "Habitat Reserve and Other Open Space" are intended for permanent retention in open space to protect significant plants and wildlife inhabiting these areas. These lands consist of the following natural areas: ***1. Riparian Habitat.*** Land occupied by riparian vegetation along the banks of the Salinas River shall be retained and the scarce riparian habitat preserved. Use of these lands for development purposes is further restricted by the potential for flooding. ***2. Coastal Strand and Dunes.*** These lands adjacent to Monterey Bay provide habitat for rare, threatened wildlife and plant species. Approximately 1,600 acres west of Highway One are designated as habitat reserve for this purpose. Except for a limited number of areas where visitor-serving facilities and public park use is to be permitted, this entire area shall be retained as open space. As part of the "Habitat Reserve"	This policy is intended to protect significant plants and wildlife from impacts of development.	<u>Potentially Inconsistent:</u> The subsurface slant wells, Source Water Pipeline, and new Transmission Main are proposed for sites in or around areas designated as "Habitat Reserves and Other Open Space." These Habitat Reserves are comprised of sensitive natural communities (which may include wetlands and waters). Installation of the facilities and maintenance of the subsurface slant wells could disrupt such communities. This issue is addressed further under Impacts 4.6-1, 4.6-2, 4.6-3, 4.6-6, 4.6-7, and 4.6-8 and mitigation measures are provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone and inland areas) (cont.)				designation, a stand-alone State Park designation is recognized as an appropriate use by this plan for the 370 acre Lonestar property, with the condition that most of this site be provided with an implementing funding source for protection of its habitat values, and recreational uses be limited and subordinated to the habitat requirements of sensitive plant and wildlife species occurring here. On both public and privately owned lands, dune habitat shall be restored to a healthy condition. ***3. Maritime Chaparral.*** Coastal Scrub, and Coast Live Oak Woodland. Approximately 1,160 acres of land within the Marina Planning Area is designated for permanent retention in open space so as to protect maritime chaparral, coastal scrub, and coast live oak woodlands and other plant and wildlife species that inhabit these areas. The designated lands include approximately 600 acres in the University of California Natural Reserve System located next to the Monterey Bay Educational, Science, and Technology Center; an adjoining 124-acre site occupying a combination of lands conveyed to the City as part of the transfer of the airport and adjacent land on Armstrong Ranch and 160 acres located within the larger East Garrison Reserve. Another 227-acre reserve is located south of Imjin Road. This area is a former landfill site that has been capped, and which will be restored as a natural habitat area. An additional 50 acres located along the east side of Highway One in the vicinity of the planned extension of Del Monte Boulevard is also a designated reserve. ***4. Wetlands.*** An area of 80 acres on the Armstrong Ranch property between Del Monte Boulevard and Highway One is designated as Habitat Reserve due to the presence of vernal ponds. Additional small areas where vernal ponds occur may exist elsewhere on the Armstrong property. Prior to approval of development plans for this property, biological field surveys shall be conducted to determine if additional vernal ponds exist. If such surveys document the existence of such ponds, development plans must provide either for the preservation or replacement of this habitat.		
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 8:*** To prohibit further degradation of the beach environment and conserve its unique qualities.	This policy is intended to protect beach habitat.	Potentially Inconsistent: Installation of the subsurface slant wells and a portion of the Source Water Pipeline and maintenance of the subsurface slant wells may occur adjacent to, and could disrupt, beaches. This issue is addressed further in Impacts 4.6-2 and 4.6-8 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 19:*** To promote reclamation and protection of native dune habitat and vegetation except in areas presently being mined.	This policy is intended to protect native dune habitat, including vegetation.	Potentially Inconsistent: Installation of the subsurface slant wells and portions of the Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main, and maintenance of the subsurface slant wells would occur within, and could disrupt, native central dune scrub. This issue is addressed further in Impacts 4.6-2 and 4.6-7 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 23:*** To support continuation of the coastal-dependent sand mining operations as long as they are economically feasible and their operations are managed with sensitivity to the adjacent dune environment.	This policy is intended to ensure that continued coastal-dependent sand mining operations are protective of nearby dune environments.	Consistent: The proposed project does not include coastal-dependent sand mining operations.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 24:*** To protect and encourage the restoration of the vernal ponds to their original state and allow only those uses adjacent which will reinforce and conserve the unique habitat qualities of these ponds.	This policy is intended to protect vernal ponds.	Potentially Inconsistent: Vernal ponds (including the pond associated with Locke-Paddon Park) occur in the vicinity of the proposed new Desalinated Water Pipeline alignment and could be adversely affected by pipeline construction. This issue is addressed further in Impact 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 25:*** To protect the habitat of recognized rare and endangered species found in the Coastal dune area.	This policy is intended to protect special-status species habitat found in coastal dunes.	Potentially Inconsistent: Installation of the subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main, and maintenance of the subsurface slant wells would occur within, and could disrupt native central dune scrub, where special-status species are either known to occur or have potential to occur. This issue is addressed further in Impacts 4.6-1, 4.6-2, 4.6-6, and 4.6-7 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 26:*** To regulate development in areas adjacent to recognized rare and endangered species or their habitats so that they will not threaten continuation of the species or its habitat.	This policy is intended to protect areas of rare and endangered species habitat (including wetlands) from impacts of development.	Potentially Inconsistent: Installation of the subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main, and maintenance of the subsurface slant wells would occur adjacent to, and could indirectly disrupt, special-status species habitat (including wetlands). This issue is addressed further in Impacts 4.6-1, 4.6-2, 4.6-3, 4.6-6, 4.6-7, and 4.6-8 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Planning Guidelines	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	**Rare and Endangered Species: Habitat Protection.** In Marina's Coastal Zone, the foredune, dune and grassy inland areas all contain potential habitat for rare and endangered plants and animals. The precise range for each plant and animal is not known because intensive site-specific study throughout the area was not financially possible. However, the potential for various rare and endangered habitats has been identified and mapped (see Environmental Capability section) to provide a guide to the locations where more intensive study is required. Because a site-specific study is needed in many areas before any development can take place, the following policies apply to all of the areas indicated on the map[1] or meeting the definitions of Exhibit "A" as being potential habitats for rare and endangered plants and animals. • Before any use or change in use, areas identified as potential habitat for rare and endangered plant or animal species shall be investigated by a qualified biologist to determine the physical extent of the primary habitat areas for the specific rare and endangered plants and animals on that site. • Primary habitat areas shall be protected and preserved against any disruption of habitat values and only uses dependent on those resources shall be allowed within those areas. All development must be sited and designed so as not to interfere with the natural functions of such habitat areas. Management and enhancement opportunities should be incorporated into use or development proposals; potential impacts shall be fully mitigated, including the assurance of long-term mitigation and maintenance of habitat through the use of appropriate acreage replacement/restoration ratios for any unavoidable direct impacts on habitat areas. • Potential secondary or support habitat areas to the primary habitats identified on the site should also be defined. Secondary habitat investigation should include identification of the role and importance of the secondary area to the primary habitat area and should stress the impact of use or development in the secondary area on the primary habitat. All development in this area must be designed to prevent significant adverse impacts on the primary habitat areas. In concert with State law, City Ordinances shall require environmental review and appropriate mitigation of identified impacts for all development in the Coastal Zone, including the assurance of long term mitigation and maintenance of habitat through the use of appropriate acreage replacement/restoration ratios for any unavoidable direct impacts on habitat areas. • Development in wetlands shall be prohibited. Access for nature observation shall be the only exception; and this access should not be permitted unless a qualified biologist determines that the impacts of construction and human observation can be sufficiently mitigated to insure continuation of the rare and endangered species and/or its habitat. • Available evidence indicates that dune vegetation is more resilient than previously thought, and areas damaged by illegal use or negligence shall be considered restorable and eligible for restoration.	This policy is intended to protect special-status species habitat (including wetlands), which includes primary habitat (defined as all of the environmentally sensitive habitat areas in Marina) and secondary habitat (defined as areas adjacent to primary habitat areas within which development must be sited and designed to prevent impacts which would significantly degrade the primary habitat).	Potentially Inconsistent: Installation of the subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main, and maintenance of the subsurface slant wells would occur within special-status species habitats (including wetlands and including those defined as primary and secondary habitat in the City of Marina LCLUP). This issue is addressed further in Impacts 4.6-1, 4.6-2, 4.6-3 4.6-4, 4.6-6, 4.6-7, and 4.6-8. Mitigation measures are provided to reduce or avoid impacts on special-status species habitats. However, as described in Impact 4.6-4, construction of these facilities, and maintenance of the subsurface slant wells, would be inconsistent with the City of Marina LCLUP, a significant and unavoidable impact.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone) (cont.)				• Where habitats of rare and endangered species are located on any parcel, owners and/or operators shall, at such time that development is proposed, develop and execute a Management Plan which will protect identified rare and endangered plant and animal communities. Each plan should be drawn up by a qualified biologist in cooperation with the property owner developer. [1] Presumably this refers to the maps entitled "Natural Habitats" and "Potential Wildlife Habitats." [2] Exhibit 'A' Habitat Definitions: *Primary habitat*. This term includes all of the environmentally sensitive areas in Marina. These are as follows: 1. Habitat for all identified plant and animal species which are rare, endangered, threatened, or are necessary for the survival of an endangered species. These species will be collectively referred to as "rare and endangered". 2. Vernal ponds and their associated wetland vegetation. The Statewide Interpretive Guideline for Wetlands and Other Wet Environmentally Sensitive Habitat Areas (California Coastal Commission, February 14, 1981) contains technical criteria for establishing the inland boundary of wetland vegetation. 3. All native dune vegetation, where such vegetation is extensive enough to perform the special role of stabilizing Marina's natural sand dune formations. 4. Areas otherwise defined as secondary habitat that have an especially valuable role in an ecosystem for sensitive plant or animal life., as determined by a qualified biologist approved by the City. *Secondary habitat*. This term refers to areas adjacent to primary habitat areas within which development must be sited and designed to prevent impacts which would significantly degrade the primary habitat. The secondary habitat area will be presumed to include the following, subject to more precise determination upon individual site investigation: 1. The potential/known localities of rare and endangered plant species as shown on LUP page 71 ("Disturbed Vegetation" map). 2. The potential wildlife habitats as shown on LUP page 75 ("Potential Wildlife" map). 3. Any area within 100 feet of the landward boundary of a wetland primary habitat area. *Rare and endangered species*. In Marina, this term will apply to those plant and animal species which are rare, endangered, threatened or are necessary for the survival of such species. The Environmental Analysis Report prepared for this LUP identified such species in the dune habitat areas. While future scientific studies may result in addition or deletion of species, the list presently includes: 1. Smith's Blue Butterfly (Shijimiaeoides enoptes smithi) 2. Globose Dune Beetle (Coelus globosus) 3. Black Legless Lizard (Anniella pulchra nigra) 4. Salinas Kangaroo Rat (Dipodomys Heermanni Goldmani) 5. Seaside Painted Cup (Castilleja latifolia ssp. latifolia) 6. Monterey Spine Flower (Chorizanthe pungens var. pungens) 7. Eastwood's Ericameria (Ericameria fasciculata) 8. Coast Wallfower (Erysimum ammophilum) 9. Menzies' Wallflower (Erysimum menziesii) 10. Coastal Dunes Milk Vetch (Astragalus tener var. titi) 11. Dune Gilia (Gilia tenuiflora var. arenaria) 12. Wild Buckwheat (Erigonum latifolium)* 13. Wild Buckwheat (Erigonum parvifolium)* 14. Bush Lupine (Lupinus ssp.)+ * only within the range of Smith's Blue Butterfly. + only within the range of the Black Legless Lizard.		

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Planning Guidelines	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	**Wetlands Protection.** Despite their seasonal nature, the vernal ponds are considered to be coastal wetlands. There are several vernal ponds remaining in Marina's Coastal Zone; all but one supports a marsh. Most of the ponds are brackish and, except in the very wettest years, most are dry for some part of the year. The following shall be applied when planning in or near the vernal ponds: ● Because of their fragile geology, no new structures shall be allowed within the vernal pond itself. The only new structure allowed in the wetland area should be those designed for public access for nature observation. No access structure should be allowed without thorough investigation by a qualified biologist and geologist. Design should include mitigation for all impacts identified by these specialists. ● New development within the drainage areas of the natural Vernal Ponds shall be regulated to protect the vernal pond and its water quality. No development within the drainage area of a vernal pond should be approved without investigation by a qualified biologist as well as other necessary specialists. Grading setbacks, reduction of impervious surface coverage, siltation basins, and other appropriate measures shall be employed to protect the ponds and their wetlands. ● A 100 foot riparian setback shall be established from the edge of all wetlands. ● The City should encourage State participation in the preservation and restoration of the historic vernal ponds and their wetlands.	This policy is intended to protect vernal pools and their associated wetlands.	<u>Potentially Inconsistent:</u> Vernal ponds (including the pond associated with Locke-Paddon Park) occur in the vicinity of the proposed new Desalinated Water Pipeline alignment. Construction could occur within the 100-foot riparian setback of the edge of the vernal ponds and water quality within the vernal ponds could be adversely affected by pipeline construction. This issue is addressed further in Impact 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone and inland areas)	Marina Municipal Code	Chapter 17.51 – Tree Removal, Preservation and Protection	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Chapter 17.51 –*** Tree Removal, Preservation and Protection includes measures to preserve and maintain existing trees. This ordinance requires that a tree removal permit be obtained from the City for any tree that shall be removed or relocated.	This policy is intended to protect trees.	<u>Potentially Inconsistent:</u> Installation of the Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main could result in tree removal. This issue is addressed further in Impact 4.6-4 and a mitigation measure is provided to reduce or avoid any impacts. No trees occur at the subsurface slant well site.
Fort Ord Dunes State Park	Fort Ord Dunes State Park General Plan and Environmental Impact Report	Physical Resources	New Transmission Main	**BIO-8:** Preserve large areas of coastal dune habitat. Restore land that is in degraded condition, but includes some remaining native species, and is located adjacent to intact areas of coastal dune habitat in order to create large areas of connected, viable habitat of native plants and animals. Areas that serve to connect existing and potentially restored habitat areas should be considered as a very high priority, as these corridors will re-connect remnant habitats, creating what could become an extensive network of natural habitats within the park.	This policy is intended to preserve and restore coastal dune habitat.	<u>Potentially Inconsistent:</u> Installation of the new Transmission Main would occur within central dune scrub. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
City of Monterey (inland areas)	Monterey City Code	Chapter 37 – Preservation of Trees and Shrubs	Ryan Ranch-Bishop Interconnection Improvements	***Chapter 37 –*** Preservation of Trees and Shrubs is intended to assure preservation of trees and replacement of trees when removal is unavoidable. A tree permit is required to be obtained from the City for removal or excessive pruning of any protected tree. Protected trees are defined as a) trees located on a vacant private parcel that are more than two inches (2") in diameter when measured at a point four feet six inches (4'6") above the tree's natural grade; and, b) trees located on a private, developed parcel that are more than six inches (6") when measured at a point four feet six inches (4'6") above the tree's natural grade. The City can also designate Local Landmark Trees, which is an outstanding, healthy, and prominent tree that is designated landmark in accordance to procedures established in the Municipal Code.	This policy is intended to preserve and mitigate for the loss of protected trees and Local Landmark Trees.	<u>Potentially Inconsistent:</u> Installation of the Ryan Ranch-Bishop Interconnection Improvements may require tree removal or tree trimming. This issue is addressed further in Impact 4.6-4 and mitigation measures are provided to reduce or avoid any impacts.
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Coastal Zone	New Transmission Main	**Policy NCR-CZ 1.1.C:** Minimize Adverse Effects to Natural Coastal Resources. New development shall be located in areas where it will not have a significant adverse effect either individually or cumulatively on natural coastal resources and public access and recreation.	This policy is intended to protect natural coastal resources, such as sensitive natural communities, wetlands, and special-status species.	<u>Potentially Inconsistent:</u> Installation of the new Transmission Main could occur within, and/or disturb, sensitive natural communities, wetlands, and special-status species habitat. These issues are addressed further in Impacts 4.6-1, 4.6-2 and 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Coastal Zone	New Transmission Main	**Policy NCR-CZ 1.2.A:** Designation of ESHA. Areas of particular habitat value and fragility consistent with Policy LUD-CZ 1.3.B are considered Environmentally Sensitive Habitat Areas (ESHA). Actual determination of ESHA boundaries shall be based on facts on the ground at the time development is considered.	This policy is intended to protect environmentally sensitive habitat areas (which may include wetlands and waters).	<u>Potentially Inconsistent:</u> Installation of the new Transmission Main could occur within, and disrupt, environmentally sensitive habitat areas (which may include wetlands and waters). This issue is addressed further in Impacts 4.6-2, and 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Coastal Zone	New Transmission Main	***Policy NCR-CZ 1.2.B:*** Protection of ESHA I. ESHAs shall be protected against significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas. II. Development in areas adjacent to ESHAs shall be sited and designed to prevent impacts which would significantly degrade those areas and shall be compatible with the continuance of those habitat areas. III. Site-specific surveys to confirm the presence and extent of identifiable plant and animal life or habitats shall be required for all new development in, and adjacent to, ESHA. Site-specific surveys shall be prepared by a qualified biologist and shall include recommended mitigation measures to avoid, and where avoidance is not possible, minimize sensitive habitat impacts.	This policy is intended to protect environmentally sensitive habitat areas (which may include wetlands and waters).	<u>Potentially Inconsistent:</u> Installation of the new Transmission Main could occur within, and disrupt, environmentally sensitive habitat areas (which may include wetlands and waters). This issue is addressed further in Impacts 4.6-2 and 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Coastal Zone	New Transmission Main	***Policy NCR-CZ 1.3.A:*** Designation of Wetlands. Areas periodically or permanently covered with water that meet the definition of wetland in Coastal Act Section 30121, are considered to be wetlands. The presence of either hydrology, soils, or vegetation must be evidenced for an area to qualify as a wetland. Actual determination of wetland boundaries shall be based on facts on the ground at the time development is considered.	This policy is intended to protect wetlands.	<u>Potentially Inconsistent:</u> Installation of the new Transmission Main could occur within, and disturb, wetlands. This issue is addressed further in Impact 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Coastal Zone	New Transmission Main	***Policy NCR-CZ 1.3.B:*** Protection of Wetlands I. The biological health and productivity of wetland areas shall be maintained, and where feasible, restored. II. Development that may have an adverse effect on a wetland shall not be allowed. The biological productivity of coastal waters, streams, wetlands, estuaries, and lakes, shall be maintained and restored, where feasible, to maintain optimum populations of marine organisms and to protect human health where applicable. Maintenance and restoration efforts shall support biological productivity by minimizing adverse effects of wastewater discharges and entrainment; controlling runoff, preventing substantial interference with surface water flow, and minimizing alteration of natural streams; preventing depletion of groundwater supplies; encouraging wastewater reclamation; and maintaining natural vegetation buffer areas that protect riparian habitats.	This policy is intended to protect wetlands and waters.	<u>Potentially Inconsistent:</u> Installation of the new Transmission Main could occur within, and disturb, wetlands and waters. This issue is addressed further in Impact 4.6-3 and mitigation measures are provided to reduce or avoid any impacts. Water quality is addressed in EIR/EIS Section 4.3, Surface Water Hydrology and Water Quality.
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Coastal Zone	New Transmission Main	***Policy LUD-CZ 3.1.A:*** Considerations for Natural Habitat Areas – ESHA • Proposed development in areas adjacent to an ESHA, including wetlands (as identified earlier by Policies NCR-CZ 1.2.A and 1.3.A), shall be required to demonstrate that it is sited and designed to be compatible with the protection of these resources. • Proposed development in areas adjacent to an ESHA (including wetlands) shall be required to provide a site-specific resource report prepared by a qualified biologist. The report shall include, at a minimum, the following: - A site-specific survey evaluating existing known resources at the time of proposed development. A map identifying existing known resources within the project's identified area of potential impact at the time of proposed development. - An evaluation of necessary buffers and/or setbacks required around any identified ESHA, wetland or riparian vegetation to ensure the long term biological integrity of the resource. All identified necessary buffers and/or setbacks required to ensure the biological integrity of the resource shall be mapped. i. Buffers or setbacks are required around Natural Habitat Areas including ESHA, riparian vegetation, and wetlands of a sufficient size to ensure the biological integrity of the resource, including under changing sea level conditions.	This policy is intended to protect environmentally sensitive habitat areas (which may include wetlands and waters).	<u>Potentially Inconsistent:</u> Installation of the new Transmission Main could occur within, and disturb, environmentally sensitive habitat areas (which may include wetlands and waters). This issue is addressed further in Impacts 4.6-2 and 4.6-3 and mitigation measures are provided to reduce or avoid any impacts

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Seaside (coastal zone) (cont.)				ii. A minimum buffer of 50 feet as measured from the extent of identified habitat type shall be required, unless a biological assessment results in information indicating that expanded or reduced setback/buffer would ensure the biological integrity of the resource. Smaller setbacks or buffers may be allowed only if it can be demonstrated that: (1) the required minimum 50-foot buffer would render the site unusable for its designated use; and (2) the buffer has been adjusted downward only to a point where the designated use can be accommodated. Under no circumstances shall the buffer be reduced to less than 25-feet. If the buffer/setback is adjusted downward, additional mitigation measures developed in consultation with the Department of Fish & Game shall be implemented. iii. No permanent structures shall be permitted within the required buffer/setback area except for structures of a minor nature that do not lead to significant degradation of the resource such as fences or at grade improvements for public access and/or recreation purposes (i.e. paths, trails, platforms, parking). • Identification of all biological impacts of proposed development. • Alternatives and/or mitigation for avoiding and/or reducing any identified impacts to a less than a significant level. Mitigation / Restoration and Monitoring Program for any mitigation required, including identification of appropriate acre replacement / restoration ratios for any unavoidable impacts.		
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Coastal Zone	New Transmission Main	***Policy LUD-CZ 3.1B:*** Considerations for Natural Habitat Areas – Wetland Vegetation Management. For proposed development within the coastal zone, a Vegetation Management Report prepared by a qualified biologist shall be required. The report shall consist, at a minimum, of the following: • A site-specific survey of the vegetation and habitat types at the time of proposed development. • A map identifying existing vegetation and habitat types relative to the identified project area, and identification of all potential impacts associated with the proposed development. • Identification of appropriate native plant species for use in restoration activities. • Identification of appropriate buffers, or setbacks, necessary to protect identified vegetation • Alternatives and/or mitigation for avoiding and/or minimizing identified impacts. Mitigation shall include procedures and planting/maintenance plans that will encourage, enhance, or reestablish desirable plant communities. The Vegetation Management Report shall be consistent with the most current version of the Wetland Management/Enhancement and Restoration Program (refer to Policy NCR-CZ 1.5D).	This policy is intended to protect environmentally sensitive habitat areas (which may include wetlands and waters).	<u>Potentially Inconsistent:</u> Installation of the new Transmission Main could occur within environmentally sensitive habitat areas (which may include wetlands and waters). This issue is addressed further in Impacts 4.6-2 and 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Conservation/ Open Space	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Policy COS-4.2:*** Protect and enhance the creeks, lakes, and adjacent wetlands for their value in providing visual amenity, habitat for wildlife, and recreational opportunities.	This policy is intended to protect wetlands and waters.	<u>Consistent:</u> Potential wetlands or waters were not observed within the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline alignment within the City of Seaside.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Conservation/ Open Space	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline	***Policy COS-4.3:*** Encourage the preservation and enhancement of oak woodland elements in the natural and built environments.	This policy is intended to protect oak woodlands.	<u>Potentially Inconsistent:</u> Installation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline could occur within and disturb oak woodlands. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 8.54 – Trees	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Chapter 8.54*** –Regulates and controls the planting, removal, protection and preservation of trees within the city. A permit is required for the removal or alteration of any tree on private property in the city without a permit issued as provided in this chapter. A permit is also required to plant any Coast Redwood, Blue Gum Eucalyptus, Willow, Cottonwood or Poplar within the city.	This policy is intended to protect trees.	<u>Potentially Inconsistent:</u> Installation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline could result in removal or alteration of trees. This issue is addressed further in Impacts 4.6-1 and 4.6-4 and mitigation measures are provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (inland areas)	Carmel Valley Master Plan	Natural Resources	Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements	***Policy CV-3.7:*** Areas of biological significance shall be identified and preserved as open space. These include, but are not limited to: a. The redwood community of Robinson Canyon; b. The riparian community and redwood community of Garzas Creek; c. All wetlands, including marshes, seeps, and springs (restricted occurrence, sensitivity, outstanding wildlife value). d. Native bunchgrass stands and natural meadows (restricted occurrence and sensitivity). e. Cliffs, rock outcrops, and unusual geologic substrates (restricted occurrence). f. Ridgelines and wildlife migration routes (wildlife value).	This policy is intended to protect sensitive natural communities (which may include wetlands and waters) and wildlife corridors.	Potentially Inconsistent: Installation of the Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements could disturb sensitive natural communities (which may include wetlands and waters). This issue is addressed further in Impacts 4.6-2 and 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (inland areas)	Carmel Valley Master Plan	Natural Resources	Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements	***Policy CV-3.8:*** Development shall be sited to protect riparian vegetation, minimize erosion, and preserve the visual aspects of the Carmel River. In places where the riparian vegetation no longer exists, it should be planted to a width of 150 feet from the river bank, or the face of adjacent bluffs, whichever is less. Density may be transferred from this area to other areas within a lot.	This policy is intended to protect sensitive natural communities and wetlands and waters of the Carmel River.	Consistent: The Carmel Valley Pump Station would not impact the Carmel River or associated riparian vegetation. The Main System- Hidden Hills Interconnection Improvements would not occur in the vicinity of the Carmel River.
County of Monterey (inland areas)	Carmel Valley Master Plan	Natural Resources	Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements	***Policy CV-4.1(b):*** Motorized vehicles shall be prohibited on the banks or in the bed of the Carmel River, except by permit from the Water Management District or Monterey County.	This policy is intended to protect sensitive natural communities and wetlands and waters of the Carmel River.	Consistent: Construction of the Carmel Valley Pump Station would not require use of motorized vehicles within the Carmel River. The Main System-Hidden Hills Interconnection Improvements would not occur in the vicinity of the Carmel River and therefore no motorized vehicles would be used within the Carmel River
County of Monterey (inland areas)	Carmel Valley Master Plan	Natural Resources	Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements	***Policy CV-3.10:*** b. Valley oaks should be incorporated on floodplain terraces. c. Weedy species such as pampas grass and genista shall not be planted in the Valley. e. The chaparral community shall be maintained in its natural state to the maximum extent feasible in order to preserve soil stability and wildlife habitat and also be consistent with fire safety standards.	This policy is intended to protect sensitive natural communities.	Consistent: Sensitive natural communities do not occur at the proposed Carmel Valley Pump Station and the Carmel Valley Pump Station does not include restoration of a floodplain terrace or planting weedy species. Installation of the Main System-Hidden Hills Interconnection Improvements is not located on a floodplain, does not including planting weedy species, and chaparral does not occur at the site.
County of Monterey (inland areas)	Carmel Valley Master Plan	Natural Resources	Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements	***Policy CV-3.11:*** The County shall discourage the removal of healthy native oak and madrone and redwood trees in the Carmel Valley Master Plan Area. A permit shall be required for the removal of any of these trees with a trunk diameter in excess of six inches, measured two feet above ground level. Where feasible, trees removed will be replaced by nursery-grown trees of the same species and not less than one gallon in size. A minimum fine, equivalent to the retail value of the wood removed, shall be imposed for each violation. In the case of emergency caused by the hazardous or dangerous condition of a tree and requiring immediate action for the safety of life or property, a tree may be removed without the above permit, provided the County is notified of the action within ten working days. Exemptions to the above permit requirement shall include tree removal by public utilities, as specified in the California Public Utility Commission's General Order 95, and by governmental agencies.	This policy is intended to protect native oak, madrone, and redwood trees.	Potentially Inconsistent: Installation of the Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements could result in the removal of native oak, madrone, and redwood trees. This issue is addressed further in Impact 4.6-4 and a mitigation measure is provided to reduce or avoid any impacts.
County of Monterey (coastal zone and inland areas)	Greater Monterey Peninsula Area Plan	Conservation/Open space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy GMP-3.5:*** Removal of healthy, native oak, Monterey pine, and redwood trees in the Greater Monterey Peninsula Planning Area shall be discouraged. An ordinance shall be developed to identify required procedures for removal of these trees. Said ordinance shall take into account fuel modification needed for fire prevention in the vicinity of structures and shall include: a. Permit requirements. b. Replacement criteria c. Exceptions for emergencies and governmental agencies	This policy is intended to protect native oak, madrone, and redwood trees.	Potentially Inconsistent: Installation of the of the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station could result in the removal of native oak, madrone, and redwood trees. This issue is addressed further in Impact 4.6-4 and a mitigation measure is provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone and inland areas)	Greater Monterey Peninsula Area Plan	Conservation/Open space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy GMP-3.6:*** A 100-foot setback from all wetlands, as identified by a County-approved biologist, shall be provided and maintained in open space use. No new development shall be allowed in this setback area. No landscape alterations will be allowed in this setback area unless accomplished in conjunction with a restoration and enhancement plan prepared by a County-approved biologist and approved by the California Department of Fish and Wildlife.	This policy is intended to protect wetlands and waters.	Potentially Inconsistent t: Installation of the Brine Discharge Pipeline and Pipeline to CSIP Pond would occur within 100-feet of a potential wetland. The impact would be temporary and there would be no permanent aboveground facilities. After project construction, a 100-foot setback from the potential would remain. This issue is addressed further in Impact 4.6-3 and mitigation measures are provided to reduce or avoid any impacts. Installation of the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station within the Greater Monterey Peninsula Area Plan area would not occur within 100-feet of potential wetland.
County of Monterey (coastal zone and inland areas)	Greater Monterey Peninsula Area Plan	Conservation/Open space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy GMP-3.9:*** Critical habitat areas should be preserved as open space. When an entire parcel cannot be developed because of this policy, a low intensity, clustered development may be approved. However, the development should be located on those portions of the land least biologically significant so that the development will not upset the natural function of the surrounding ecosystem.	This policy is intended to protect critical habitat, sensitive natural communities, and habitat for special-status species.	Potentially Inconsistent: Installation of the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station could occur in or around critical habitat, sensitive natural communities, and/or habitat for special-status species. This issue is discussed in Impacts 4.6-1 and 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 21.64 – Special Regulations	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Section 21.64.260*** – Preservation of Oak and Other Protected Trees. In Monterey County oak trees within areas designated as Resource Conservation, Residential, Commercial, or Industrial cannot be removed without the approval of necessary permits. Exceptions include removal of oak trees pursuant to the purpose and standards required in areas designated as Agriculture, Industrial, and or Mineral Extraction. In addition, Title 20, Parts 2-5, addresses native tree removal and protection in the Coastal Zone and Title 21 outside the Coastal Zone. Chapter 16 of the Monterey County Municipal Code also addresses oak and other native tree protection. Native trees in Monterey County, as defined in the ordinance, include Santa Lucia fir, black cottonwood, Fremont cottonwood, box elder, willows, California laurel, sycamores, oaks and madrones. Trees must be at least six inches in diameter two feet above the ground level in order to be subject to these regulations. A landmark oak tree is defined as an oak tree that is 24 inches or more in diameter when measured two feet above ground level or one that is visually significant, historically significant, or exemplary of its species. Removal of any landmark tree is prohibited unless approved by the County Director of Planning and Building Inspection.	This policy is intended to protect oak and other native trees.	Potentially Inconsistent: Installation of the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station could result in the removal of oak and other native trees. This issue is addressed further in Impacts 4.6-4 and a mitigation measure is provided to reduce or avoid any impacts.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-4.1:*** Federal and State listed native marine and fresh water species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant shall be protected. Species designated in Area Plans shall also be protected.	This policy is intended to protect special-status species.	Potentially Inconsistent: As detailed in **Table 4.6-6**, special-status species could occur within the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station sites. Construction of these facilities could result in impacts on special-status species. This issue is addressed further in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts.

**TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES**

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.1:*** The extent and acreages of critical habitat shall be inventoried to the extent feasible and mapped in GIS. Conservation of listed species shall be promoted.	This policy is intended to protect listed species and critical habitat.	<u>Potentially Inconsistent:</u> As detailed in **Table 4.6-6**, listed species and/or critical habitat occur or have potential to occur within the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station sites. Construction of these project components may disrupt such species and/or critical habitat. This issue is addressed further in Impacts 4.6-1 and 4.6-2and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.2:*** The extent and acreages of the potentially suitable habitat for listed species shall be inventoried to the extent feasible and mapped in GIS. Conservation of species shall be promoted as provided in the Area Plans.	This policy is intended to protect listed species and critical habitat.	<u>Potentially Inconsistent:</u> As detailed in **Table 4.6-6**, listed species and/or critical habitat occur or have potential to occur within the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station sites. Construction of these project components may disrupt such species and/or critical habitat. This issue is addressed further in Impacts 4.6-1 and 4.6-2and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.4:*** Development shall avoid, minimize, and mitigate impacts on listed species and critical habitat to the extent feasible. Measures may include but are not limited to: a. clustering lots for development to avoid critical habitat areas, b. dedications of permanent conservation easements; or c. other appropriate means. If development may affect listed species, consultation with USFWS and CDFW may be required and impacts may be mitigated by expanding the resource elsewhere onsite or within close proximity offsite. Final mitigation requirements would be determined as required by law.	This policy is intended to protect listed species and critical habitat.	<u>Potentially Inconsistent:</u> As detailed in **Table 4.6-6**, listed species and/or critical habitat occur or have potential to occur within the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station sites. Construction of these project components may disrupt such species and/or critical habitat. This issue is addressed further in Impacts 4.6-1 and 4.6-2and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.5:*** Landowners and developers shall be encouraged to preserve the integrity of existing terrain and native vegetation in visually sensitive areas such as hillsides, ridges, and watersheds. Routine and Ongoing Agricultural Activities shall be exempt from this policy.	This policy is intended to protect sensitive natural communities.	<u>Potentially Inconsistent:</u> As detailed in **Table 4.6-6**, sensitive natural communities occur or have potential to occur at the proposed MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Main System-Hidden Hills Interconnection Improvements sites. Construction of these facilities could affect sensitive natural communities. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. Sensitive natural communities do not occur at the Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Ryan Ranch-Bishop Interconnection Improvements and Carmel Valley Pump Station sites in unincorporated Monterey County.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.6:*** Native and native compatible species, especially drought resistant species, shall be utilized in fulfilling landscaping requirements.	This policy is intended to protect native plant species and prevent the introduction and spread of non-native and invasive plant species used in landscaping.	<u>Potentially Inconsistent:</u> Upon completion of construction, disturbed areas would be restored to their approximate pre-construction condition. Site restoration could involve the use of non-native plant species. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.11:*** Conservation of large, continuous expanses of native trees and vegetation shall be promoted as the most suitable habitat for maintaining abundant and diverse wildlife.	This policy is intended to protect sensitive natural communities, trees, and wildlife corridors.	<u>Potentially Inconsistent:</u> As detailed in **Table 4.6-6**, sensitive natural communities and/or trees occur or have potential to occur at the proposed MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station. Construction of these facilities could affect sensitive natural communities and/or trees. This issue is addressed further in Impacts 4.6-2 and 4.6-4 and mitigation measures are provided to reduce or avoid any impacts. Construction of all of these facilities would not affect wildlife corridors.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.13:*** Efforts to obtain and preserve natural areas of particular biologic, scientific, or educational interest, and restrict incompatible uses from encroaching upon them, shall be encouraged.	This policy is intended to protect sensitive natural communities.	<u>Potentially Inconsistent:</u> As detailed in **Table 4.6-6**, sensitive natural communities occur or have potential to occur at the proposed MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Main System-Hidden Hills Interconnection Improvements sites. Construction of these facilities could affect sensitive natural communities. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. Sensitive natural communities do not occur at the Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Ryan Ranch-Bishop Interconnection Improvements and Carmel Valley Pump Station sites in unincorporated Monterey County.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.16:*** A biological study shall be required for any development project requiring a discretionary permit and having the potential to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or substantially reduce the number or restrict the range of an endangered, rare, or threatened species. An ordinance establishing minimum standards for a biological study and biological surveys shall be enacted. A biological study shall include a field reconnaissance performed at the appropriate time of year. Based on the results of the biological study, biological surveys may be necessary to identify, describe, and delineate the habitats or species that are potentially impacted. Feasible measures to reduce significant impacts to a less than significant level shall be adopted as conditions of approval.	This policy is intended to protect sensitive natural communities, wetlands and waters, and special-status species.	<u>Potentially Inconsistent:</u> As detailed in **Table 4.6-6**, special-status species, sensitive natural communities, and/or wetlands and waters occur or have the potential to occur within, or in the vicinity of, the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements and Carmel Valley Pump Station sites. Construction of these facilities could affect special-status species, sensitive natural communities, and/or wetlands and waters. These issues are addressed further in Impacts 4.6-1, 4.6-2, and 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.17:*** The County shall prepare, adopt, and implement a program that allows projects to mitigate the loss of critical habitat. The program may include ratios, payment of fees, or some other mechanisms in consultation with responsible state and/or federal regulatory agencies. Until such time as the program has been established, projects shall mitigate the loss of critical habitat on an individual basis in consultation with responsible state and/or federal regulatory agencies. A Community Plan or Rural Center Plan that includes a mitigation program shall not be subject to this policy.	This policy is intended to protect critical habitat.	<u>Potentially Inconsistent:</u> Critical habitat occurs within the vicinity of the Source Water Pipeline, Castroville Pipeline, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station sites and could be indirectly affected by these facilities. This issue is discussed in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.18:*** Prior to disturbing any federal or state jurisdictional areas, all applicable federal and state permitting requirements shall be met, including all mitigation measures for development of jurisdictional areas and associated riparian habitats.	This policy is intended to protect wetlands and waters.	Potentially Inconsistent: Installation of the Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, and Carmel Valley Pump Station could disturb wetlands and waters. This issue is addressed further in Impact 4.6-3 and mitigation measures are provided to reduce or avoid any impacts. Construction of the MPWSP Desalination Plant and the Main System-Hidden Hills Interconnection Improvements are not expected to impact waters or waters.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.22:*** In order to preserve riparian habitat, conserve the value of streams and rivers as wildlife corridors and reduce sediment and other water quality impacts of new development, the county shall develop and adopt a Stream Setback Ordinance. The ordinance shall establish minimum standards for the avoidance and setbacks for new development relative to streams. The ordinance shall identify specific setbacks relative to the following rivers and creeks so they can be implemented in the Area Plans: Salinas, Carmel River, Arroyo Seco, Pajaro River, Nacimiento, San Antonio, Gabilan Creek, and Toro Creek. The ordinance may identify specific setbacks for other creeks or may apply generic setbacks based on the stream classification developed for the ordinance. The ordinance shall delineate appropriate uses within the setback area that shall not cause removal of riparian habitat, compromise identified riparian wildlife corridors, or compromise water quality of the relevant stream while also taking into consideration uses that serve health and safety purposes. The Stream Setback Ordinance shall apply to all discretionary development, County public projects, and to conversion of lands uncultivated for the previous 30 years, on normal soil slopes over 15% or on highly erodible soils on slopes over 10%.	This policy is intended to protect streams and associated riparian habitat.	Potentially Inconsistent: Installation of the Castroville Pipeline would occur approximately 150 feet of the Salinas River. Construction activities could indirectly impact this features. This issue is addressed further in Impact 4.6-3 and mitigation measures are provided to reduce or avoid any impacts. Installation of the Carmel Valley Pump Station would occur approximately 280 feet from the Carmel River. Project compliance with the NPDES project would ensure construction would not degrade water quality in the Rivers. Streams and associated riparian habitat do not occur in or around the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements sites.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.23:*** The County shall prepare, adopt and implement a program that allows projects to mitigate the loss of oak woodlands, while also taking into consideration wildfire prevention/protection. Consistent with California Public Resources Code Section 21083.4, the program shall identify a combination of the following mitigation alternatives: a. Ratios for replacement, b. Payment of fees to mitigate the loss or direct replacement for the loss of oak woodlands and monitoring for compliance; and c. Conservation easements. The program shall identify criteria for suitable donor sites. Mitigation for the loss of oak woodlands may be either onsite or offsite. The program shall allow payment of fees to either a local fund established by the County or a state fund. Until such time as the County program is implemented consistent with Public Resources Code Section 21083.4(b), projects shall pay a fee to the state Oak Woodlands Conservation Fund (OWCF). Replacement of oak woodlands shall provide for equivalent acreage and ecological value at a minimum of 1:1 ratio. The program shall prioritize the conservation of oak woodlands that are within known wildlife corridors as a high priority. The oak woodlands mitigation program shall be adopted within 5 years of adoption of the General Plan.	This policy is intended to protect oak woodlands.	Potentially Inconsistent: Installation of the Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements could disturb oak woodlands. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. Oak woodlands do not occur at the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, and Carmel Valley Pump Station sites within unincorporated Monterey County.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.24:*** The County shall require discretionary projects to retain movement corridors of adequate size and habitat quality to allow for continued wildlife use based on the needs of the species occupying the habitat. The County shall require that expansion of its roadways and public infrastructure projects provide movement opportunities for terrestrial wildlife and ensure that existing stream channels and riparian corridors continue to provide for wildlife movement and access.	This policy is intended to protect wildlife movement corridors.	Consistent: Installation of the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements and Carmel Valley Pump Station would not substantially disrupt wildlife movement through wildlife corridors

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.25:*** Occupied nests of statutorily protected migratory birds and raptors shall not be disturbed during the breeding season (generally February 1 to September 15). The County shall: a. Consult, or require the developer to consult, with a qualified biologist prior to any site preparation or construction work in order to: 1. Determine whether work is proposed during nesting season for migratory birds or raptors, 2. Determine whether site vegetation is suitable to nesting migratory birds or raptors, 3. Identify any regulatory requirements for setbacks or other avoidance measures for migratory birds and raptors which could nest on the site, and 4. Establish project-specific requirements for setbacks, lock-out periods, or other methods of avoidance of disruption of nesting birds. b. Require the development to follow the recommendations of the biologist. This measure may be implemented in one of two ways: 1. Preconstruction surveys may be conducted to identify active nests and, if found, adequate buffers shall be provided to avoid active nest disruption until after the young have fledged; or 2. Vegetation removal may be conducted during the non-breeding season (generally September 16 to January 31); however, removal of vegetation along waterways shall require approval of all appropriate local, state, and federal agencies. This policy shall not apply in the case of an emergency fire event requiring tree removal. This policy shall apply for tree removal that addresses fire safety planning, since removal can be scheduled to reduce impacts on migratory birds and raptors.	This policy is intended to protect migratory birds and raptors during the breeding season.	<u>Potentially Inconsistent:</u> Installation of the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements and Carmel Valley Pump Station could disturb migratory birds and raptors during the breeding season. This issue is addressed further in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.1:*** With the exception of resource dependent uses, all development, including vegetation removal, excavation, grading, filling, and the construction of roads and structures, shall be prohibited in the following environmentally sensitive habitat areas: riparian corridors, wetlands, dunes, sites of known rare and endangered species of plants and animals, rookeries, major roosting and haulout sites, and other wildlife breeding or nursery areas identified as environmentally sensitive. Resource dependent uses, including nature education and research hunting, fishing and aquaculture, where allowed by the plan, shall be allowed within environmentally sensitive habitats only if such uses will not cause significant disruption of habitat values.	This policy is intended to protect environmentally sensitive habitats, wetlands and waters, and special-status species.	<u>Potentially Inconsistent:</u> Installation of the Source Water Pipeline and new Desalinated Water Pipeline would occur within central dune scrub. Central dune scrub would likely be considered an environmentally sensitive habitat. Additionally, several special-status species, as listed in **Table 4.6-6**, occur or have the potential to occur within these alignments. Construction of the above-referenced project components could disrupt these sensitive habitats and species. These issues are addressed further in Impacts 4.6-1 and 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. No potential wetlands or waters were observed in or around the proposed Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.2:*** Land uses adjacent to locations of environmentally sensitive habitats shall be compatible with the long-term maintenance of the resource. New land uses shall be considered compatible only where they incorporate all site planning and design features needed to prevent habitat impacts, upon habitat values and where they do not establish a precedent for continued land development which, on a cumulative basis, could degrade the resource.	This policy is intended to protect environmentally sensitive habitats (which may include wetlands and waters).	<u>Potentially Inconsistent:</u> Installation of the Source Water Pipeline and new Desalinated Water Pipeline would occur within and adjacent to central dune scrub. Central dune scrub would likely be considered an environmentally sensitive habitat. Construction of the above-referenced project components could disrupt this sensitive habitat. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. No potential wetlands or waters were observed in or around the proposed Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.3:*** New development adjacent to locations of environmentally sensitive habitats shall be compatible with the long-term maintenance of the resource. New subdivisions shall be approved only where significant impacts on environmentally sensitive habitats from development of proposed parcels will not occur.	This policy is intended to protect environmentally sensitive habitats (which may include wetlands and waters).	<u>Potentially Inconsistent</u>: Installation of the Source Water Pipeline and new Desalinated Water Pipeline would occur within and adjacent to central dune scrub. Central dune scrub would likely be considered an environmentally sensitive habitat. Construction of the above-referenced project components could disrupt this sensitive habitat. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. No potential wetlands or waters were observed in or around the proposed Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.4:*** To protect environmentally sensitive habitats and the high wildlife values associated with large areas of undisturbed habitat, the County shall maintain significant and, where possible, contiguous areas of undisturbed land for low intensity recreation, education, or resource conservation use. To this end, parcels of land totally within sensitive habitat areas shall not be further subdivided. On parcels adjacent to sensitive habitats, or containing sensitive habitats as part of their acreage, development shall be clustered to prevent habitat impacts.	This policy is intended to protect environmentally sensitive habitats (which may include wetlands and waters).	<u>Potentially Inconsistent:</u> Installation of the Source Water Pipeline and new Desalinated Water Pipeline would occur within and adjacent to central dune scrub. Central dune scrub would likely be considered an environmentally sensitive habitat. Construction of the above-referenced project components could disrupt this sensitive habitat. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. No potential wetlands or waters were observed in or around the proposed Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.5:*** Where private or public development is proposed in documented or potential locations of environmentally sensitive habitats – particularly those habitats identified in General Policy No. 1- field surveys by qualified individuals or agencies shall be required in order to determine precise locations and to recommend mitigating measures to ensure protection of any sensitive habitat present. The required survey shall document that the proposed development complies with all applicable environmentally sensitive habitat policies.	This policy is intended to protect environmentally sensitive habitats (which may include wetlands and waters).	<u>Potentially Inconsistent:</u> Installation of the Source Water Pipeline and new Desalinated Water Pipeline would occur within and adjacent to central dune scrub. Central dune scrub would likely be considered an environmentally sensitive habitat. Construction of the above-referenced project components could disrupt this sensitive habitat. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. No potential wetlands or waters were observed in or around the proposed Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.6:*** The County shall ensure the protection of environmentally sensitive habitats through deed restrictions or dedications of permanent conservation easements. Where land divisions or development are proposed in areas containing environmentally sensitive habitats, such restrictions or easements shall be established through the development review process.	This policy is intended to protect environmentally sensitive habitats (which may include wetlands and waters).	<u>Potentially Inconsistent:</u> Installation of the Source Water Pipeline and new Desalinated Water Pipeline would occur within and adjacent to central dune scrub. Central dune scrub would likely be considered an environmentally sensitive habitat. Construction of the above-referenced project components could disrupt this sensitive habitat. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. No potential wetlands or waters were observed in or around the proposed Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.8:*** Where development is permitted in or adjacent to environmentally sensitive habitat areas (consistent with all other resource protection policies), the County, through the development review process, shall restrict the removal of indigenous vegetation and land disturbance (grading, excavation, paving, etc.) to the minimum amount necessary for structural improvements.	This policy is intended to protect environmentally sensitive habitats (which may include wetlands and waters).	<u>Potentially Inconsistent:</u> Installation of the Source Water Pipeline and new Desalinated Water Pipeline would occur within and adjacent to central dune scrub. Central dune scrub would likely be considered an environmentally sensitive habitat. Construction of the above-referenced project components could disrupt this sensitive habitat. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. No potential wetlands or waters were observed in or around the proposed Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.9:*** The County shall require the use of non-invasive plant species in proposed landscaping and should encourage the use of appropriate native species or species that are compatible with native plants.	This policy is intended to protect native plant species and prevent the introduction and spread of non-native and invasive plant species used in landscaping.	Potentially Inconsistent: Upon completion of construction, disturbed areas would be restored to their approximate pre-construction condition. Site restoration could involve the use of non-native plant species. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.10:*** Construction activities, industrial, and public and commercial recreational uses which would affect rare and endangered birds shall be regulated to protect habitats of rare, endangered, and threatened birds during breeding and nesting seasons. Regulations may include restriction of access, noise abatement, and restriction of hours of operation of public or private facilities. Regulations shall not prohibit emergency operation of service and public utility equipment. Access in such locations shall be confined to appropriate areas on designated trails and paths. No access shall be approved which results in significant disruption of habitat.	This policy is intended to protect breeding rare and endangered birds.	Potentially Inconsistent: Installation of the Source Water Pipeline and new Desalinated Water Pipeline could affect breeding rare birds. This issue is addressed further in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts. The Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area do not contain habitat for endangered birds.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.A2:*** Maritime chaparral is an uncommon, highly localized and variable plant community that has been reduced in North County by residential and agricultural development. Further conversion of maritime chaparral habitat to agricultural uses is highly discouraged. Where new residential development is proposed in chaparral areas, it shall be sited and designed to protect the maximum amount of maritime chaparral. All chaparral on land exceeding 25 percent slope should be left undisturbed to prevent potential erosion impacts as well as to protect the habitat itself.	This policy is intended to protect maritime chaparral.	Consistent: Maritime chaparral does not occur within the Source Water Pipeline and new Desalinated Water Pipeline.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.A4:*** Oak woodland on land exceeding 25 percent slope should be left in its native state to protect this plant community and animal habitat from the impacts of development and erosion. Development within oak woodland on 25 percent slope or less shall be sited to minimize disruption of vegetation and habitat loss.	This policy is intended to protect oak woodland	Consistent: Oak woodland does not occur within Source Water Pipeline and new Desalinated Water Pipeline.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.A6:*** Coastal dune habitats in areas shown as Resource Conservation or as Scenic and Natural Resource Recreation on the plan map shall be preserved and protected. Appropriate uses in such areas shall be limited to scientific, education and low intensity recreational uses, and within the Moss Landing area, essential utility pipelines where no feasible alternative exists. Disturbance or destruction of dune vegetation shall be prohibited, unless no feasible alternative exists, and then only if re-vegetation with similar species is made a condition of project approval. Any resulting dune disturbance shall be restored to the natural condition.	This policy is intended to protect coastal dune habitat within areas mapped as Resource Conservation or as Scenic and Natural Resource Recreation.	Consistent: The Source Water Pipeline and new Desalinated Water Pipeline are not proposed for areas mapped as Resource Conservation or as Scenic and Natural Resource Recreation.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.A9:*** Where major access routes are available or desirable through the dunes to the coast, boardwalks or other appropriate pathways constructed of permeable materials should be provided to protect the vegetation stabilizing the dunes. Other access routes through the dunes should be controlled and only allowed in limited circumstances.	This policy is intended to protect coastal dune habitat where access routes would pass through the dunes to the coast.	Consistent: Installation of the Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area would not include installation of an access route through the dunes to the coast.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.B1:*** Riparian plant communities shall be protected by establishing setback requirements consisting of 150 feet on each side of the bank of perennial streams, and 50 feet on each side of the bank of intermittent streams, or the extent of riparian vegetation, whichever is greater. In all cases, the setback must be sufficient to prevent significant degradation of the habitat area. The setback requirement may be modified if it can be conclusively demonstrated by a qualified biologist that a narrower corridor is sufficient or a wider corridor is necessary to protect existing riparian vegetation from the impacts of adjacent use.	This policy is intended to protect riparian plant communities associated with streams.	Consistent: Riparian plant communities associated with streams do not occur within or adjacent to the Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.B2:*** All development, including dredging, filling, and grading within stream corridors, shall be limited to activities necessary for flood control purposes, water supply projects, improvement of fish and wildlife habitat, or laying of pipelines when no alternative route is feasible, and continued and future use of utility lines and appurtenant facilities. These activities shall be carried out in such a manner as to minimize impacts from increased runoff, sedimentation, biochemical degradation, or thermal pollution. When such activities require removal of riparian plant species, re-vegetation with native plants shall be required.	This policy is intended to protect stream corridors and associated riparian vegetation.	Consistent: Streams do not occur within or adjacent to the Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.B3:*** The following activities shall be prohibited within intermittent and perennial stream channels: cultivated agriculture, pesticide applications, and installation of septic systems would not destroy vegetative ground cover of the stream channel.	This policy is intended to protect intermittent and perennial stream channels.	Consistent: Streams do not occur within or adjacent to the Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.B4:*** A setback of 100 feet from the landward edge of vegetation of all coastal wetlands shall be provided and maintained in open space use. No permanent structures except for those necessary for resource-dependent use which cannot be located elsewhere shall be constructed in the setback area. Prior to approval of all proposed structures in the setback area, it must be demonstrated that the development does not significantly disrupt the habitat resource.	This policy is intended to protect coastal wetlands.	Consistent: Potential wetlands or waters do not occur in or around the proposed Source Water within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.B5:*** All wetland areas of the North County Coastal Zone shall be protected and preserved for their plant and wildlife values, including but not limited to McClusky Slough, Pajaro River, Salinas River, Salinas River Lagoon, Elkhorn Slough, Bennett Slough, and Moro Cojo Slough. The County's existing Non Pointsource Pollution Program shall be implemented.	This policy is intended to protect wetlands.	Consistent: Potential wetlands or waters do not occur in or around the proposed Source Water Pipeline within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.B6:*** Dredging or other major construction activities shall be conducted so as to avoid breeding seasons and other critical phases in the life cycles of commercial species of fish and shellfish and other rare, endangered, and threatened indigenous species.	This policy is intended to protect commercial species of fish and shellfish and other special-status species.	Potentially Inconsistent: Installation of the Source Water Pipeline and new Desalinated Water Pipeline could occur during the breeding season and other critical phases of special-status species as listed in **Table 4.6-6**. This issue is addressed further in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts. Impacts related to commercial species of fish and shellfish are discussed in EIR/EIS Section 4.5 Marine Resources.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.C1:*** Wildlife management considerations should be included in the evaluation of development proposals, particularly land division proposals. Large, and where feasible, contiguous areas or corridors of native vegetation should be retained in order to meet the various needs of those wildlife species requiring large areas of undisturbed habitat.	This policy is intended to protect wildlife corridors.	Consistent: Installation and maintenance of the Source Water Pipeline and new Desalinated Water Pipeline would not result in the loss of large contiguous areas or wildlife corridors.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.C2:*** Critical wildlife habitat areas (refer to General Policy 2) shall be protected and an adequate distance based on a site-by-site analysis between such habitat and disturbed areas (e.g., building sites and roads) shall be maintained.	This policy is intended to protect sensitive natural communities and habitat for special-status species.	Potentially inconsistent: Installation of the Source Water Pipeline and new Desalinated Water Pipeline would occur within sensitive natural communities and known or potential habitat for special-status species as detailed in **Table 4.6-6**. This issue is addressed further in Impacts 4.6-1 and 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone)	North County Land Use Plan	Land Use and Development	Source Water Pipeline and new Desalinated Water Pipeline	***Key Policy 4.3.4:*** All future development within the North County coastal segment must be clearly consistent with the protection of the area's significant human and cultural resources, agriculture, natural resources, and water quality.	This policy is intended to provide long-term resource management and protection.	Potentially Inconsistent: Construction of the Source Water Pipeline and new Desalinated Water Pipeline could disrupt sensitive natural communities and/or species dependent upon those habitats. These issues are addressed further in Impacts 4.6-1 and 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. Potential wetlands or waters do not occur in or around the proposed Source Water Pipeline within the North County Land Use Plan area.
County of Monterey (inland areas)	North County Area Plan	Conservation/ Open Space	Castroville Pipeline	***Policy NC-3.3:*** Conservation of North County's native vegetation shall be given high priority to: a. Retain the viability of threatened or limited vegetative communities and animal habitats, b. Promote the area's natural scenic qualities, and c. Preserve rare, endangered, and endemic plants for scientific study. d. Property owners shall be encouraged to cooperate with the County in establishing conservation easements over areas of native vegetation.	This policy is intended to protect special-status species and sensitive natural communities.	Potentially Inconsistent: Construction of the Castroville Pipeline could affect special-status species and sensitive natural communities. These issues are addressed further in Impacts 4.6-1 and 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (inland areas)	North County Area Plan	Conservation/ Open Space	Castroville Pipeline	***Policy NC-3.4:*** Removal of healthy, native oak and madrone trees in the North Monterey County Area shall be discouraged. An ordinance shall be developed to identify required procedures for removal of these trees. Said ordinance shall take into account fuel modification needed for fire prevention in the vicinity of structures and shall include: a. Permit requirements b. Replacement criteria c. Exceptions for emergencies and governmental agencies	This policy is intended to protect native oak and madrone trees.	Potentially Inconsistent: Construction of the Castroville Pipeline could require the removal of native oak or madrone trees. This issue is addressed further in Impact 4.6-4 and a mitigation measure is provided to reduce or avoid any impacts.
County of Monterey (inland areas)	North County Area Plan	Conservation/ Open Space	Castroville Pipeline	***Policy NC-3.5:*** Critical habitat areas should be preserved as open space. When an entire parcel cannot be developed because of this policy, a low intensity, clustered development may be approved. However, the development should be located on those portions of the land least biologically significant so that the development will not upset the natural function of the surrounding ecosystem.	This policy is intended to protect critical habitat, sensitive natural communities, and habitat for special-status species.	Potentially Inconsistent: Construction of the Castroville Pipeline could sensitive natural communities and habitat for special-status species. This issue is addressed further in Impacts 4.6-1 and 4.6-2 and mitigation measures are provided to avoid any impacts. Construction of the Castroville Pipeline would comply with the NPDES program and would not alter critical habitat.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Biological Resources Policy A-2:*** The City shall ensure that measures are taken to prevent degradation and siltation of the ephemeral drainage that passes through the Planned Residential Extension District and Community Park in Polygon 24.	This policy is intended to protect a potential wetland.	Consistent: Installation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline would not affect the wetland located within Polygon 24.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Biological Resources Policy A-4:*** The City shall encourage the preservation of small pockets of habitat and populations of HMP species within and around developed areas. ***Program A-4.1:*** The City shall require project applicants who propose development in underdeveloped natural lands to conduct reconnaissance-level surveys to verify the general description of resources for the parcel provided in the biological resource documents prepared for the U.S. Army Corps of Engineers. The information gathered through these reconnaissance-level surveys shall be submitted as a component of the project application package. ***Program A-4.3:*** Where development will replace existing habitat which supports sensitive biological resources, the City shall encourage attempts to salvage some of those resources by collecting seed or cuttings of plants, transplanting vegetation, or capturing and relocating sensitive wildlife species.	This policy is intended to protect sensitive natural communities and special-status species.	Potentially Inconsistent: Installation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline could occur within or adjacent to sensitive natural communities and/or habitat for special-status species as detailed in **Table 4.6-6**. These issues are further addressed in Impacts 4.6-1 and 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Biological Resources Policy A-9:*** The County shall encourage the preservation of small pockets of habitat and populations of HMP species within and around developed areas. ***Program A-9.1:*** The County shall require project applicants who propose development in undeveloped natural lands to conduct reconnaissance-level surveys to verify the general description of resources for the parcel provided in the biological resource documents prepared for the U.S. Army Corps of Engineers. The information gathered through these reconnaissance-level surveys shall be submitted as a component of the project application package. ***Program A-9.3:*** Where development will replace existing habitat which supports sensitive biological resources, the County shall encourage attempts to salvage some of those resources by collecting seed or cuttings of plants, transplanting vegetation, or capturing and relocating sensitive wildlife species.	This policy is intended to protect special-status species.	Potentially Inconsistent: Installation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline could occur within or adjacent to habitat for special-status species as detailed in **Table 4.6-6**. This issue is further addressed in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Biological Resources Policy B-1:*** The City shall strive to avoid or minimize loss of sensitive species listed in Table 4.4-2 that are known or expected to occur in areas planned for development. ***Program B-1.2:*** If any sensitive species listed in Table 4.4-2 are found in areas proposed for development, all reasonable efforts should be made to avoid habitat occupied by these species while still meeting project goals and objectives. If permanent avoidance is infeasible, a seasonal avoidance and/or salvage/ relocation program shall be prepared. The seasonal avoidance and/or salvage/ relocation program for these species should be coordinated through the CRMP.	This policy is intended to protect special-status species.	Potentially Inconsistent: Installation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline could occur within or adjacent to habitat for special-status species as detailed in **Table 4.6-6**. This issue is further addressed in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Biological Resources Policy C-1:*** The City shall encourage that grading for projects in undeveloped lands be planned to complement surrounding topography and minimize habitat disturbance.	This policy is intended to protect sensitive natural communities.	Potentially Inconsistent: Installation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline could occur within or adjacent to sensitive natural communities. This issue is further addressed in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Biological Resources Policy C-3:*** Lighting of outdoor areas shall be minimized and carefully controlled to maintain habitat quality for wildlife in undeveloped natural lands. Street lighting shall be as unobtrusive as practicable and shall be consistent in intensity throughout development areas adjacent to undeveloped natural lands.	This policy is intended to protect wildlife and their habitats from nighttime lighting.	Consistent: Operation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline would not include outdoor lighting in or around undeveloped natural lands.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Biological Resources Policy D-1:*** The City shall require project applicants to implement a contractor education program that instructs construction workers on the sensitivity of biological resources in the vicinity and provides specifics for certain species that may be recovered and relocated from particular development areas.	This policy is intended to protect special-status species.	Potentially Inconsistent: Installation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline could occur within or adjacent to habitat for special-status species as detailed in **Table 4.6-6**. This issue is further addressed in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Biological Resources Policy A-9:*** The County shall encourage the preservation of small pockets of habitat and populations of HMP species within and around developed areas. ***Program A-9.1:*** The County shall require project applicants who propose development in undeveloped natural lands to conduct reconnaissance-level surveys to verify the general description of resources for the parcel provided in the biological resource documents prepared for the U.S. Army Corps of Engineers. The information gathered through these reconnaissance-level surveys shall be submitted as a component of the project application package. ***Program A-9.3:*** Where development will replace existing habitat which supports sensitive biological resources, the County shall encourage attempts to salvage some of those resources by collecting seed or cuttings of plants, transplanting vegetation, or capturing and relocating sensitive wildlife species.	This policy is intended to protect sensitive natural communities and special-status species.	Potentially Inconsistent: Installation of the Ryan Ranch-Bishop Interconnection Improvements could affect sensitive natural communities and special-status species. This issue is further addressed in Impacts 4.6-1 and 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	**Biological Resources Policy B-1:** The County shall strive to avoid or minimize loss of sensitive species listed in Table 4.4-2 that are known or expected to occur in areas planned for development. ***Program B-1.2:*** If any sensitive species listed in Table 4.4-2 are found in areas proposed for development, all reasonable efforts should be made to avoid habitat occupied by these species while still meeting project goals and objectives. If permanent avoidance is infeasible, a seasonal avoidance and/or salvage/ relocation program shall be prepared. The seasonal avoidance and/or salvage/ relocation program for these species should be coordinated through the CRMP.	This policy is intended to protect special-status species.	Potentially Inconsistent: Installation of the Ryan Ranch-Bishop Interconnection Improvements could affect special-status species. This issue is further addressed in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	**Biological Resources Policy C-1:** The County of Monterey shall encourage that grading for projects be designed to complement surrounding topography, minimize habitat disturbance.	This policy is intended to protect sensitive natural communities.	Potentially Inconsistent: Installation of the Ryan Ranch-Bishop Interconnection Improvements could affect sensitive natural communities. This issue is further addressed in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Biological Resources Policy C-3:*** Lighting of outdoor areas shall be minimized and carefully controlled to maintain habitat quality for wildlife in undeveloped natural lands. Street lighting shall be as unobtrusive as practicable and shall be consistent in intensity throughout development areas adjacent to undeveloped natural lands.	This policy is intended to protect wildlife and their habitats from nighttime lighting.	Consistent: Installation and operations of the Ryan Ranch-Bishop Interconnections Improvements facility would not include night lighting.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Biological Resources Policy D-1:*** The County shall require project applicants to implement a contractor education program that instructs construction workers on the sensitivity of biological resources in the vicinity and provides specifics for certain species that may be recovered and relocated from particular development areas. 1. In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities. 2. Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines. 3. Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas. 4. Restoration purposes. 5. Nature study, aquaculture, or similar resource dependent activities.	This policy is intended to protect special-status species.	<u>Potentially Inconsistent:</u> Installation of the Ryan Ranch-Bishop Interconnection Improvements could affect special-status species. This issue is further addressed in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts.

SOURCES: California State Parks, 2004; City of Marina, 2000, 2013; City of Seaside, 2004; FORA, 1997; Monterey County 1985, 1999, 2010.

4.6.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to terrestrial biological resources if it would:

- Have a substantial adverse effect, either directly, indirectly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW, USFWS, or NMFS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in federal, state, local, or regional plans, policies, regulations, or by the CDFW, USFWS, or NMFS;
- Result in a substantial adverse effect on critical habitat;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Result in a substantial adverse effect on federal “other waters” as defined in the Code of Federal Regulations (40 CFR 122.2);
- Result in a substantial adverse effect on waters of the state, as defined by the California Water Code Section 13050 [e], through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Be inconsistent with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- Introduce or spread an invasive non-native species; or
- Be inconsistent with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

Based on the location and nature of the proposed project, the following criteria are not considered in the impact analyses in Sections 4.6.5.1 and 4.6.5.2 for the reasons described below.

Interfere substantially with the movement of native fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. As discussed in Section 4.6.1.7, Wildlife Movement Corridors, the majority of the site is located within or adjacent to developed areas, which do not serve as wildlife movement corridors. Although some wildlife moves through these roadways and trails, they would likely travel in undisturbed areas located adjacent to these features and outside of the project area. Terrestrial wildlife habitat in the project area is fragmented by agricultural fields, residential developments, commercial/industrial developments, and roads. The majority of the construction disturbance involves temporary construction of pipelines in developed or disturbed areas, which would not substantially impede wildlife movement in undisturbed wildlife corridors. Although some wildlife may be deterred from movement through the construction site during construction, construction would largely occur in areas that are subject to current development or disturbance. Additionally, project construction would be implemented in segments so only portions of the project site would be under construction at any one time. The proposed project does not include the permanent placement of structures within creeks, rivers, or other waterways and would not substantially impede the movement of native resident or migratory fish or wildlife corridors or impede the use of native wildlife nursery sites. Implementation of the proposed project would result in a negligible impact relative to this criterion.

Impacts to special-status species are addressed in Impact 4.6-1 and 4.6-6 below.

No work would occur within the Carmel River so it was not included as part of this analysis. Implementation of the proposed project would comply with California State Water Resources Control Board (SWRCB) Order 95-10 as described in Section 1.3 in Chapter 1, Introduction and Background, and the proposed project would not increase the quantity of Carmel River water in CalAm's water supply portfolio for the Monterey District service area (Monterey District). As described in Section 3.2.4 in Chapter 3, Description of the Proposed Project, the proposed improvements to the Seaside Groundwater Basin ASR system would not affect CalAm's maximum allowable surface water diversions from the Carmel River for injection into the Seaside Groundwater Basin. Rather, project implementation would secure replacement water supplies for the Monterey District, enabling CalAm to reduce its current diversions from the Carmel River system to its legal right to 3,376 afy (equivalent to about 3 mgd). Therefore, implementation of the proposed project would have a beneficial effect on stream flows in the Carmel River and the river's aquatic and riparian biological resources.

4.6.4 Approach to Analysis

The following is a discussion of the approaches to, and definitions of, significance of impacts on terrestrial biological resources. General CEQA and NEPA guidance regarding significance of impacts is provided in Section 4.1.

In addition to the general guidance provided in Section 4.1, CEQA Guidelines Section 15065 includes specific references to biological resources and directs lead agencies to find that a project may have a significant effect on the environment if it has the potential to substantially degrade the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or substantially reduce the number or restrict the range of an endangered, rare, or threatened species. NEPA requires consideration of both context and intensity in assessing impacts, as outlined in detail in Section 4.1.

The potential impacts of the project on special-status species were assessed based on literature review, professional judgment, and the following considerations:

1. A determination of species occurrence. The determination of species occurrence was presented in Section 4.6.1, Setting, above. This determination evaluated each species': (a) potential occurrence within the project area (i.e., the area within which all construction-related disturbance would occur, includes facility footprints) or (b) potential occurrence in the project vicinity (generally defined as the terrestrial and aquatic habitats of the areas adjacent to the project area). This determination was based on an analysis of life history

and habitat requirements, as well as the suitability of habitat for the species found within and adjacent to the project area. If a species was determined unlikely to occur in the project area or project vicinity, or had a low potential to occur in the project area or project vicinity (for example, if no potential habitat exists for the species in the vicinity), then the species was given no further consideration. The impact analyses presented in Sections 4.6.5.1 and 4.6.5.2, below, consider only those species actually observed or with a moderate to high potential to occur in the project area and/or vicinity.

The results of this determination for each species for the project as a whole are provided in the "Potential for Species Occurrence" column of **Table F-1** located in **Appendix F** of this EIR/EIS. **Table 4.6-2**, above, provides the potential for each species considered to occur in habitat within, or adjacent to, each project facility.

2. A determination of impact. The determination of impact is presented under Section 4.6.5, Direct and Indirect Effects of the Proposed Project, within Section 4.6.5.1, Construction Impacts and Section 4.6.5.2, Operational and Facility Siting Impacts. If suitable habitat was determined to be present within the project area and the species has been documented in the project vicinity or has at least a moderate potential to occur, the analysis then considered whether project implementation would result in a substantial adverse effect on the species. Both direct effects (e.g., mortality attributable to construction activities, or displacement of habitat) and indirect effects (e.g., construction-related noise and dust emissions) were considered. In evaluating the likelihood and severity of an impact, the life history and habitat requirements of a species also were considered.

   For the purposes of this EIR/EIS, the definition of the word "substantial" as used in the significance criteria above has three principal factors:

   - Magnitude[16] or intensity and duration of the impact;
   - Rarity and context of the affected resource; and
   - Susceptibility of the affected resource to disturbance.

   The evaluation of significance must also consider the interrelationship of these three factors. For example, a relatively small-magnitude impact on a state- or federally listed species could be considered significant if the species is rare and highly susceptible to disturbance. Conversely, for a natural community such as California annual grassland, which is not necessarily considered rare or highly sensitive to disturbance, a much larger magnitude of impact might be required to result in a significant impact.

This project would require authorization from various regulatory agencies including the USACE, USFWS, NMFS, RWQCB, CDFW, and CCC. The mitigation measures prescribed below reflect the anticipated terms and conditions in the authorizations. Based on the professional judgment and experience of the biologists that conducted this analysis, the mitigation measures in this section (and their constituent requirements and performance standards) would minimize and avoid impacts such that they would be reduced to a less-than-significant level.

[16] Magnitude may include the aerial extent of impact, number of species affected, length of time, or intensity of impact.

4.6.5 Direct and Indirect Effects of the Proposed Project

TABLE 4.6-5
SUMMARY OF IMPACTS – TERRESTRIAL BIOLOGICAL RESOURCES

Impacts	Significance Determinations
Impact 4.6-1: Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly, indirectly or through habitat modification, during construction.	LSM
Impact 4.6-2: Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during construction.	LSM
Impact 4.6-3: Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during construction.	LSM
Impact 4.6-4: Be inconsistent with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	SU
Impact 4.6-5: Introduce or spread an invasive non-native species during construction.	LSM
Impact 4.6-6: Result in substantial adverse effects on candidate, sensitive, or special-status species during project operations.	LSM
Impact 4.6-7: Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during project operations.	LSM
Impact 4.6-8: Result in substantial adverse effects on federal wetlands, federal other waters, and waters of the state during project operations.	LSM
Impact 4.6-9: Introduce or spread an invasive non-native species during project operations.	LSM
Impact 4.6-10: Be inconsistent with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan or other approved local, regional, or state habitat conservation plan.	LSM
Impact 4.6-C: Cumulative impacts related to terrestrial biological resources.	SU

NOTES:
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation
SU = Significant and Unavoidable impact for which no mitigation is available

The following impact analysis evaluates impacts of the proposed project as required by CEQA and NEPA. A Biological Assessment, which would evaluate the project's impacts on federally listed species, would be prepared in support of FESA Section 7 consultation between the ONMS and USFWS and between the ONMS and NMFS.

4.6.5.1 Construction Impacts

Impact 4.6-1: Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly, indirectly or through habitat modification, during construction. (Less than Significant with Mitigation)

This impact addresses impacts on special-status species. As defined above in Section 4.6.1.8, Special-Status Species, special-status species includes listed as well as candidate and sensitive species, and Fully Protected Species.

Special-status plants and animals that could occur at the various proposed facility sites and pipeline alignments are summarized in **Table 4.6-2**, and those species with a moderate to high potential to occur at the project sites and that could be significantly impacted during construction are presented in **Table 4.6-6**. Construction activities could result in both direct and indirect adverse effects on special-status plants and animals. In general, construction in developed areas that have been surfaced, drained, and maintained free of vegetation would have a low potential to result in substantial adverse effects on special-status species. However, if construction were to extend into areas of undeveloped natural vegetation, substantial adverse effects could occur. Construction within or adjacent to natural, high-quality habitat would have a greater potential to result in significant impacts on special-status plants and animals and/or their habitat compared to facilities adjacent to developed or highly disturbed areas.

Impact acreages are provided below for each facility when appropriate and are provided as an approximation based on the current proposed project footprint. Since many of the facilities overlap, the impact acreages provided below may overlap with the impact acreages for other facilities and optional alignments. The final impact acreages for the entire project would be based on whether the proposed project uses the proposed alignments or optional alignments.

Overview of Potential Construction Effects on Plants

Site clearance, grading, excavation, and other earthmoving activities can cause direct mortality of individual special-status plants through soil disturbance and loss of habitat. Earthmoving activities can also eliminate soil seedbanks, potentially reducing the size of local rare plant populations and adversely affecting the viability of the population by reducing reproduction below sustainable levels. Permanent indirect impacts on special-status plant species may arise from population fragmentation and introduction of non-native weeds. Population fragmentation can affect pollinator activity and, hence, reproduction and gene flow. Introduction and establishment of invasive weeds within or adjacent to special-status plant populations can reduce species growth and recruitment. In addition, indirect impacts on special-status plant species located in offsite areas can arise from fugitive dust and increased soil erosion at construction work areas and the migration of sediment into adjacent habitat, or accidental offsite habitat use by construction workers. Fugitive dust and sediment can interfere with metabolic processes such as photosynthesis and respiration.

Overview of Potential Construction Effects on Wildlife

Special-status wildlife can be trampled by construction vehicles and heavy construction equipment or get trapped in trenches or other open excavations. Vegetation and tree removal can result in direct impacts on nesting birds through loss of nests and eggs or nestling mortality, and can reduce or fragment foraging and dispersal habitat. Even at sites that have little or no wildlife habitat, impacts can occur if wildlife from adjacent habitat areas enter or pass through the construction work area. Construction can result in the temporary or permanent loss of habitat for wildlife species. Construction activities can also result in indirect impacts on special-status wildlife related to disturbance or harassment of individuals. For example, construction noise, vibration, and nighttime lighting can cause special-status birds, bats, and other animals to abandon nests, roosts, or other breeding areas. Artificial lighting during nighttime construction can also increase predation and disrupt reproductive behaviors. Introduced invasive non-native plant species can degrade habitat. Eroded sediment and hazardous construction chemicals from the construction work area can be transported offsite via site runoff and adversely affect receiving downstream water bodies and degrade habitat for both terrestrial and aquatic animals.

Subsurface Slant Wells

The subsurface slant wells include ten subsurface slant wells (the converted test slant well and nine new permanent wells). Site 1 is located along the CEMEX access road, but is situated at the approximate mid-point of the vegetated sand dunes. The majority of the remaining nine wells (Sites 2 through 6) would be installed on the eastern side of the heavily vegetated area of the sand dunes and constructed on concrete pads. The components of the proposed subsurface slant wells that would be below the mean high water line would be within the Monterey Bay National Marine Sanctuary (MBNMS). Impacts to marine biological resources from the slant well components that would be located within the MBNMS are described in Section 4.5, Marine Biological Resources. The facility components that are evaluated in this section would be located above the mean high water line and outside of the MBNMS.

Construction of the nine new permanent slant wells and conversion of the test slant well into a permanent well would disturb approximately 9 acres in the CEMEX active mining area. A portion of this construction footprint overlaps with a portion of the construction footprints for the Source Water Pipeline and Source Water Pipeline using the optional alignment. The 9 acres includes 8 acres for temporary staging, materials storage, and stockpiling areas, which would be restored following construction, and 1 acre for new permanent above-ground facilities.

Approximately 1,600 cubic yards of spoils returned from drilling the slant wells would be spread across the 8-acre temporary disturbance area and would contribute to temporary impacts in this area. The spoils would be composed of sand and would form a layer less than 2 inches thick when spread within the 8-acre temporary disturbance area. Salinity levels of the spoils from the slant wells would be in the range of brackish water (approximately 16 to 30 ppt, which is consistent with the brackish aquifer that the wells would penetrate). Soils are considered saline if conductivity is greater than 4 mS/cm (approximately 2 ppt). Conductivity in sandy dune soils has been measured between 0.2 and 0.4 mS/cm (approximately 0.1 to 0.2 ppt), considerably below the saline threshold (Donnelly and Parmenter, 1983). Input of salts (sodium, chloride and other ions) from salt spray is likely constant, but roughly equals losses due to leaching (Alpert, 2016). In regions of high rainfall, the impact of salt-spray is minimal because salt is washed off plants (and presumably, from near the soil surface) and leached out of the root zone. In dry climates, salt spray contributes to formation of a salt crust that binds sand particles (Chapman, 1976); this is not evident on sand dunes on the Monterey peninsula, therefore it can be assumed that precipitation is removing salts from the soil surface. Although the salinity of the spoils would be above existing dune sand salinity, the process of leaching and dilution would be expected to rapidly reduce salinity to background levels, particularly at or near the soil surface, and would not permanently impede the re-establishment of native plants.

TABLE 4.6-6
SPECIAL-STATUS SPECIES AND SENSITIVE NATURAL COMMUNITIES THAT COULD BE SIGNIFICANTLY IMPACTED DURING CONSTRUCTION OF THE PROPOSED FACILITIES

			Pipelines North of Reservation Road				Facilities and Improvements South of Reservation Road					
Species or Resource	**Subsurface Slant Wells**	**MPWSP Desalination Plant**	**Source Water Pipeline**	**New Desalinated Water Pipeline**	**Castroville Pipeline**	**Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond**	**ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline**	**New Transmission Main**	**Carmel Valley Pump Station**	**Ryan Ranch-Bishop Interconnection Improvements**	**Main System-Hidden Hills Interconnection Improvements**	**Staging Areas**
Federal or State Listed Species												
Plants												
Monterey spineflower	X	X	X	X	X		X	X				X
robust spineflower	X		X	X	X		X	X				X
Seaside bird's-beak	X		X	X	X		X	X				X
Menzies' wallflower	X		X	X	X			X				X
sand gilia	X		X	X	X		X	X				X
Yadon's rein orchid							X				X	X
Pacific Grove clover										X	X	
Invertebrates												
Smith's blue butterfly	X		X	X	X			X				X
Fish												
South/central California coast steelhead					X							
Amphibians												
California tiger salamander		X	X	X	X	X				X	X	X
California red-legged frog		X	X	X	X	X			X	X	X	X
Birds												
Western snowy plover	X		X									
Other Special-Status Species												
Invertebrates												
globose dune beetle	X		X									
Plants												
Hickman's onion										X	X	
Hooker's manzanita	X		X	X			X	X			X	X
Toro manzanita							X	X		X	X	
Pajaro manzanita							X	X		X	X	
sandmat manzanita	X		X	X			X	X			X	X
ocean bluff milkvetch	X		X				X					
Monterey Coast paintbrush	X		X	X	X		X	X				X
Monterey ceanothus	X		X	X			X	X				X
Congdon's tarplant		X			X					X	X	
branching beach aster	X		X	X	X			X				X
Eastwood's goldenbush	X		X	X	X		X	X			X	X
sand-loving wallflower	X		X	X	X		X	X				X
Kellogg's horkelia	X		X	X	X		X	X				X

TABLE 4.6-6 (Continued)
SPECIAL-STATUS SPECIES AND SENSITIVE NATURAL COMMUNITIES THAT COULD BE SIGNIFICANTLY IMPACTED DURING CONSTRUCTION OF THE PROPOSED FACILITIES

			Pipelines North of Reservation Road				Facilities and Improvements South of Reservation Road					
Species or Resource	Subsurface Slant Wells	MPWSP Desalination Plant	Source Water Pipeline	New Desalinated Water Pipeline	Castroville Pipeline	Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond	ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline	New Transmission Main	Carmel Valley Pump Station	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	Staging Areas
Other Special-Status Species (cont.)												
Plants (cont.)												
Carmel Valley bush-mallow							X			X	X	
marsh microseris										X	X	
northern curly-leaved monardella	X		X	X	X		X	X				X
south coast branching phacelia	X		X	X	X		X	X				X
Monterey pine									X	X	X	
Michael's rein orchid	X		X	X	X		X	X		X	X	X
Santa Cruz microseris										X	X	
Santa Cruz clover										X	X	
Reptiles												
Western pond turtle				X	X							
black legless lizard	X		X	X	X		X	X				X
silvery legless lizard	X		X	X	X		X	X				X
coast horned lizard	X		X	X			X	X				X
Coast Range newt		X	X	X	X	X	X	X	X	X	X	X
Birds												
tricolored blackbird				X				X				
short-eared owl		X	X	X	X			X				X
western burrowing owl			X	X				X				X
red-tailed hawk		X	X	X	X	X	X	X	X	X	X	X
red-shouldered hawk		X	X	X		X	X	X	X	X	X	X
Ferruginous hawk		X	X	X	X			X				
Northern harrier		X	X	X	X		X	X				X
White-tailed kite		X	X	X	X	X	X	X	X	X	X	X
California horned lark		X	X	X	X			X		X		X
American peregrine falcon		X	X	X	X	X	X	X	X	X	X	
American kestrel		X	X	X	X	X	X	X	X	X	X	X
loggerhead shrike		X	X	X	X	X	X	X	X	X	X	X
Mammals												
pallid bat		X	X	X	X	X	X	X	X	X	X	X
Salinas kangaroo rat				X				X				X
western red bat		X	X	X	X	X	X	X	X	X	X	X
Monterey dusky-footed woodrat							X	X	X	X	X	X
Monterey shrew							X	X	X	X	X	X
American badger		X	X	X	X		X	X		X	X	X

TABLE 4.6-6 (Continued)
SPECIAL-STATUS SPECIES AND SENSITIVE NATURAL COMMUNITIES THAT COULD BE SIGNIFICANTLY IMPACTED DURING CONSTRUCTION OF THE PROPOSED FACILITIES

			Pipelines North of Reservation Road				Facilities and Improvements South of Reservation Road					
Species or Resource	**Subsurface Slant Wells**	**MPWSP Desalination Plant**	**Source Water Pipeline**	**New Desalinated Water Pipeline**	**Castroville Pipeline**	**Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond**	**ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline**	**New Transmission Main**	**Carmel Valley Pump Station**	**Ryan Ranch-Bishop Interconnection Improvements**	**Main System-Hidden Hills Interconnection Improvements**	**Staging Areas**
Natural Communities												
central dune scrub	X		X	X	X			X				X
central maritime chaparral							X					
northern coastal scrub		X			X		X	X		X		X
riparian woodland and scrub				X	X							
freshwater marsh					X							
coast live oak woodland				X			X	X		X	X	X
Environmentally Sensitive Habitat Areas												
	X		X	X	X			X				X
Critical Habitat												
Monterey spineflower												
western snowy plover	X		X									
south/central California coast steelhead					X							
California red-legged frog									X		X	
Tidewater goby					X							
Potential Wetlands and Waters												
Potentially USACE, RWQCB, and/or CDFW jurisdictional					X	X			X	X	X	
Potentially USACE, RWQCB, CDFW, and/or CCC jurisdictional	X		X	X				X				X
Local Tree Policies or Ordinances												
		X	X	X	X	X	X	X	X	X	X	

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Existing ground cover at the subsurface slant well site includes relatively undisturbed central dune scrub, formerly disturbed sand dunes that are revegetating with native and non-native dune scrub vegetation, and unvegetated disturbed sandy soil. The areas of relatively intact scrub occur along the western active mining area boundary (just east of the active beach area) and at the west end of the access road in the vicinity of the CEMEX settling ponds. The current and recently disturbed areas occur east of the vegetated sand dunes and south of the CEMEX access road. Slant well construction would take approximately 15 months to complete, and could take place any time throughout the overall 24-month construction duration for the proposed project.

Monterey spineflower, sand-loving wallflower, and ocean bluff milk vetch have been observed at the site (ESA, 2013; 2014; AECOM, 2016). Construction of the subsurface slant wells and associated aboveground facilities in the CEMEX active mining area has the potential to disturb documented populations of Monterey spineflower, sand-loving wallflower, and ocean bluff milkvetch. A variety of other special-status plant species, as listed in **Table 4.6-6**, are either known to occur or have a potential to occur in central dune scrub at the site, including robust spineflower, seaside bird's-beak, Menzies' wallflower, sand gilia, Hooker's manzanita, sandmat manzanita, Monterey Coast paintbrush, Monterey ceanothus, branching beach aster, south coast branching phacelia, Eastwood's goldenbush, Kellogg's horkelia, northern curly-leaved Monardella, and Michael's rein orchid. If these species are present within or adjacent to the construction work area for the subsurface slant wells, they could be directly or indirectly impacted by construction activities during the 15-month construction period as described above under the heading *Overview of Potential Construction Effects on Plants*. This would be a significant impact.

Coast buckwheat, host plant for Smith's blue butterfly, occurs within the proposed subsurface slant wells site (ESA, 2013; 2014). Smith's blue butterfly was observed in central dune scrub in the vicinity of the proposed subsurface slant wells during 2016 surveys of the CEMEX active mining area (ESA, 2016). Removal or impacts on these plants and associated soil during construction could adversely impact individual adult butterflies, their eggs, or larvae, if present. Impacts to any life form of the Smith's blue butterfly would result in a significant impact. Construction of the subsurface slant wells has potential to temporarily impact approximately 1.6 acre of Smith's blue butterfly habitat, which would be a significant impact.[17] Coast buckwheat is expected to recover, as it is relatively easy to cultivate and reestablish in dune scrub habitat, and would be returned to pre-construction conditions. However, some potential for permanent loss of the host plant and individual butterfly eggs, larvae or adults remains possible and would be a significant impact.

As described in Section 4.6.1.8, above, western snowy plover are known to nest and breed within the beach and foredunes located west of, and within the western portion of, the CEMEX active mining area. The beach and foredunes provide important breeding/nesting and wintering habitat

[17] Impact 4.6-1 analyzes impacts from construction activities on Smith's blue butterfly. Impacts from maintenance activities on Smith's blue butterfly habitat are analyzed in Impact 4.6-6. Maintenance of the subsurface slant wells every five years would result in the permanent loss of approximately 1.6 acre of Smith's blue butterfly habitat. This maintenance area is assumed to be located within the 1.6-acre temporary construction footprint. Therefore, construction and maintenance of the subsurface slant wells would result in a permanent impact on 1.6 acre of Smith's blue butterfly habitat.

for the western snowy plover. Surveys conducted during the 2015 nesting season identified multiple nests along the stretch of beach in the vicinity of the CEMEX active mining area (Page et al., 2017). Some nests have been found in the vicinity of the CEMEX settling ponds and adjacent to the CEMEX access road (Zander, 2013) and at the location of the northernmost well site. Nesting has also been documented in the backdunes of the CEMEX active mining area where the subsurface slant wells are proposed (Neuman, 2015). Typical wintering habitat in California includes sand spits and dune-backed beaches (USFWS, 2007) and most flocks of wintering plovers would likely occur along the beach, away from the back dunes. However, individual western snowy plovers may also use the entire subsurface slant well construction area for wintering. There are approximately 1,600 acres of mapped western snowy plover critical habitat within the Monterey Bay area.

Construction of the slant wells in the CEMEX active mining area could occur year-round. The 9-acre construction footprint for the subsurface slant wells is located within potential nesting habitat and construction of the nine subsurface slant wells and conversion of the test well to a permanent production well would result in the temporary loss of 8.0 acres (for temporary construction disturbance to areas that would be restored) and permanent loss of 1.0 acre (for new permanent above-ground facilities) of potential habitat.[18] A portion of this impact area may overlap with the Source Water Pipeline. Construction noise and vibration, earthmoving activities, vegetation clearance, and night lighting associated with installation of the nine subsurface slant wells during the snowy plover nesting season (typically defined as March 1 through September 30) could also impact plovers by causing temporary flight (“flushing”) of breeding birds, nest abandonment, or nest failure. The impact to plover habitat and behavior from construction of the nine subsurface slant wells and conversion of the test well to a permanent well may have lasting effects on snowy plover behavior and would be significant.

With respect to wintering birds, construction activities would be temporary and largely occur within the backdunes, away from the beach and foredunes where flocks of plovers are typically found in this season. However, construction activities would be implemented in or around areas where plovers may occur during the winter. Construction activities associated with the conversion of the test slant well to a permanent well has the greatest likelihood of disturbing flocks of wintering plovers as it is closest to the beach where wintering flocks typically occur. Although not typical habitat, plovers may winter in the backdunes and construction of the nine subsurface slant wells in this area may impact plovers. Construction during the snowy plover wintering season (October 1 through February 28) could directly or indirectly adversely impact individual birds if present within or adjacent to the construction area. Human presence and construction noise and activities can cause roosting plovers to fly and disturb resting or foraging activities. This would be a significant impact.

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[18] Impact 4.6-1 analyzes impacts from construction activities on western snowy plover. Impacts from maintenance activities on western snowy plover habitat are analyzed in Impact 4.6-6. Maintenance of the subsurface slant wells every five years would result in the permanent loss of approximately 6 acres of potential western snowy plover habitat. This maintenance area is assumed to be located within the 8-acre temporary construction footprint. Therefore, the proposed project overall (including construction and maintenance) would result in a permanent impact on 7 acres (1 acre from construction and 6 acres from maintenance) and temporary impact on 2 acres (from construction) of western snowy plover habitat.

Construction activities may also displace wintering birds that may utilize the beach in the vicinity of the slant well or in the backdunes. Wintering habitat is not dependent on specific and stationary locations, such as nest sites during breeding season, so there is a much greater availability of suitable habitat. Abundant wintering habitat is present within the extensive dune system along the Monterey Bay shoreline north and south of the subsurface slant wells site. The beach north and south of the site is subject to some disturbance from humans or dogs; however, birds can access these areas during construction. Although birds may be initially disturbed and temporarily displaced during construction, the majority of the site (8 acres) would be returned to pre-construction conditions and birds would be able to utilize the site following construction. Temporary and permanent impacts to plover habitat were described in previous paragraphs.

Construction and operation of the test slant well has been conducted at the same location of Site 1 of the proposed subsurface slant well and its impact analysis serves as a reference for the type of impact that may result from construction of the proposed subsurface slant wells. The USFWS issued a letter of concurrence for the test slant well as part of the test slant well's FESA Section 7 consultation (USFWS, 2014). With regard to western snowy plover, the letter concurred that due to the small amount of habitat disturbance, proposed site restoration, seasonal avoidance, and implementation of other avoidance measures, the test slant well project was not likely to adversely affect western snowy plover. Construction and operation of the test slant well has been monitored and no direct take of western snowy plover has been observed (Jacob Martin, USFWS pers. comm., 2016). The scope of work for the test slant well is smaller than the scope of work for the proposed subsurface slant well. However, the analysis and findings from the test slant well support the conclusion that impacts to plovers can be reduced through implementation of avoidance and minimization measures.

Black legless lizard, silvery legless lizards, and coast horned lizard have potential to occur within the subsurface slant well site, and if present during construction, they could be directly or indirectly impacted by construction activities during the 15-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*. This would be a significant impact.

Other special-status birds protected by the federal MBTA and Section 3503 of the California Fish and Game Code, such as killdeer, may nest within or adjacent to the construction work areas for the slant wells and associated facilities. If nesting birds are present, construction activities could directly or indirectly impact these species during the 15-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*. This would be a significant impact.

Globose dune beetle has potential to occur within central dune scrub at the slant well site. If present, construction activities could degrade habitat for this species, which would be a significant impact.

Impacts of subsurface slant well construction on central dune scrub habitat for globose dune beetle, black legless lizard, silvery legless lizard, coast horned lizard, and the special-status plant species listed above are addressed below under Impact 4.6-2.

A full list of special-status species that could be significantly impacted by subsurface slant well construction is provided in Table 4.6-6. Overall, the impact on special-status species during slant well construction would be significant. However, with implementation of **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1d (Protective Measures for Western Snowy Plover)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly)**, **4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, **4.6-1p (Control Measures for Spread of Invasive Plants), 4.12-1b (General Noise Controls for Construction Equipment)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures)**, the impacts would be reduced to a less-than-significant level. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid, minimize, and compensate for impacts on the western snowy plover such as avoiding the breeding season, installing a visual construction barrier for work conducted adjacent to breeding habitat during the breeding season to reduce human disturbance to plovers, conducting pre-construction surveys to determine if plovers are present and implementing minimization measures to minimize construction impacts on plovers, if present, and compensating for habitat loss to mitigate for temporary and permanent loss of habitat; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on Smith's blue butterfly such as avoiding host plants to the extent feasible to avoid impacts to individuals, relocating host plants, duff, and/or soil that cannot be avoided, and providing compensatory mitigation for permanent impacts; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests and requiring a no-disturbance buffer around active nests if work is scheduled during the nesting season; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species such as cleaning tools and equipment before entering and leaving worksites, avoiding driving or operating equipment in weed-infested areas, and covering non-active stockpiles; requiring implementation of noise controls for construction equipment to reduce noise impacts on special-status wildlife species; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species.

MPWSP Desalination Plant

The proposed MPWSP Desalination Plant described in Chapter 3, Description of the Proposed Project, Section 3.2.2 would be constructed on the upper terrace (approximately 25 acres) of a 46-acre vacant parcel on Charles Benson Road. This facility would be located outside of the MBNMS. Nighttime construction is anticipated at the MPWSP Desalination Plant site throughout the 24-month construction period. Construction activities would disturb approximately 25 acres and the MPWSP Desalination Plant would create approximately 15 acres of impervious surface within this 25-acre construction area. The 25 acres that would be disturbed during construction is mostly non-native grassland with a small patch of yellow bush lupine scrub. Google Earth aerial photography (Google Earth, 2016) indicates the site was disked and/or mowed regularly prior to 2013, but appears to have recently been left undisturbed. Adjacent land uses include the MRWPCA Regional Wastewater Treatment Plant, crop production, and grazing.

Table 4.6-6 identifies the special-status species that could be significantly impacted by construction at the site. As described in Section 4.6.1.10, Monterey spineflower has been observed at the MPWSP Desalination Plant site and the site could support Congdon’s tarplant, a CRPR 1B.1 plant that can occur in disturbed habitats. If Monterey spineflower or Congdon’s tarplant are present within the project construction work area, earthwork activities conducted during the 24-month construction period could significantly directly or indirectly impact Monterey spineflower and Congdon’s tarplant as described above under the heading *Overview of Potential Construction Effects on Plants*. Additionally, California red-legged frog or California tiger salamander could disperse through the site. If individual California red-legged frogs or California tiger salamanders are present, construction of the MPWSP Desalination Plant could directly or indirectly impact these individuals during the 24-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact. The site does not provide high quality upland refugial habitat for these species. However, there is potential for California red-legged frog and California tiger salamander to breed in a drainage ditch or retention pond located approximately 250 feet from the site. If California red-legged frog and California tiger salamander occur in those aquatic features, then non-native grassland at the MPWSP Desalination Plant could be considered upland habitat for these species. Construction of the MPWSP Desalination Plant would result in the temporary loss of 10 acres and permanent loss of 15 acres of potential California red-legged frog and California tiger salamander upland habitat. The impact on California red-legged frog and California tiger salamander habitat would be a significant impact.

Coast Range newt and American badger could occur in grassland areas and be impacted by construction, a significant impact.

Mature ornamental eucalyptus and Monterey cypress trees planted along Charles Benson Road adjacent to the site may provide nesting and roosting habitat for raptors such as red-tailed hawk, red-shouldered hawk, and American kestrel and special-status bat species. The entire site provides potentially suitable nesting habitat for common passerines protected under the MBTA. Currently the site also provides potential foraging habitat for raptors and other birds. **Table 4.6-2** provides a complete list of special-status species with the potential to occur at the MPWSP Desalination Plant site. Nighttime construction lighting and both daytime and nighttime construction noise have the potential to disturb raptors and special-status passerines actively nesting in the trees along Charles Benson Road during the 24-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact. If nesting birds or roosting special-status bats are present within these trees, they could be harmed if the trees are removed, also a significant impact.

Steelhead are known to occur in the Salinas River (NMFS, 2007), which is located approximately 850 feet north of the MPWSP Desalination Plant site. A drainage ditch that flows into the Salinas River is located approximately 250 feet north and downslope of the MPWSP Desalination Plant site. Construction of the MPWSP Desalination Plant would not directly impact steelhead. However, soil-disturbing activities at the site could result in soil erosion and the migration of eroded soil and sediment downgradient towards the Salinas River. As discussed under Impact 4.3-1 in Section 4.3, Surface Water Hydrology and Water Quality, project construction activities that would disturb more than one acre would be subject to the National Pollutant Discharge Elimination System (NPDES) Construction General Permit requirements. Per the requirements, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared by a Qualified SWPPP Developer and a Qualified SWPPP Practitioner would oversee its implementation. The SWPPP, which would include site-specific erosion and stormwater control measures (such as installing sediment barriers like silt fencing and fiber rolls and maintaining equipment and vehicles used for construction) to be implemented during construction of the MPWSP Desalination Plant, would reduce or eliminate the offsite migration of pollutants and sediment. Mandatory compliance with the NPDES Construction General Permit would avoid substantial adverse effects on the water quality of steelhead habitat along the Salinas River. Thus, the impact on steelhead within the Salinas River would be less than significant.

The construction-related effects on special-status species described above (Monterey spineflower, Congdon's tarplant, California red-legged frog, California tiger salamander, Coast Range newt, American badger, and special-status bats and nesting birds) would result in a significant impact. Implementation of following mitigation measures would ensure that impacts on sensitive species at this site are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants), 4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1j (Avoidance and Minimization Measures for American Badger), 4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, **4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander)**, **4.6-1p (Control Measures for Spread of Invasive Plants)** and **4.14-2 (Site-**

Specific Nighttime Lighting Measures). These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of exclusion fencing to ensure special-status species are prevented from entering the construction area or can safely leave it, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests and requiring a no-disturbance buffer around active nests if work is scheduled during the nesting season; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species such as cleaning tools and equipment before entering and leaving worksites, avoiding driving or operating equipment in weed-infested areas, and covering non-active stockpiles; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species.

Pipelines and Other Conveyance Facilities North of Reservation Road

Most pipeline segments would be installed using conventional open-trench technology; however, trenchless methods would be used when open-cut trenching is not feasible or desirable. The construction sequence would typically include clearing and grading the ground surface along the pipeline alignments; excavating the trench; preparing and installing pipeline sections; installing vaults, manhole risers, manifolds, and other pipeline components; backfilling the trench with non-expansive fills; restoring preconstruction contours; and revegetating or paving the pipeline alignments, as appropriate.

Source Water Pipeline

The Source Water Pipeline is described in Section 3.2.1.2 of Chapter 3, Description of the Proposed Project. This facility would be located outside of the MBNMS. Installation of the Source Water Pipeline is anticipated to take 6 months. Although not planned, nighttime installation of the Source Water Pipeline could be required to expedite the construction schedule. The construction footprint is approximately 16.4 acres. A portion of this footprint overlaps with a portion of the construction footprints for the subsurface slant well, Castroville Pipeline, Castroville Pipeline using the optional alignment 1, Castroville Pipeline using the optional alignment 2, the new Desalinated Water Pipeline, and the new Desalinated Water Pipeline using the optional alignment.

Central dune scrub, coyote brush scrub, ice plant mats, and agricultural and ruderal areas exist along the proposed Source Water Pipeline alignment along the CEMEX access road and Lapis Road. From Lapis Road, the Source Water Pipeline alignment extends through non-native grassland and agricultural fields to the MPWSP Desalination Plant site. Monterey cypress and eucalyptus trees, which border Charles Benson Road, occur south of the pipeline alignment.

Monterey spineflower occurs in high densities along the CEMEX access road and in the surrounding sand dunes in the CEMEX active mining area (Zander Associates, 2013; 2014). Branching beach aster has been observed along Lapis Road and the CEMEX access road (URS, 2016). As indicated in **Table 4.6-2**, a number of other special-status plants may also occur in central dune scrub along this pipeline alignment. Construction of the Source Water Pipeline has potential to disturb Monterey spineflower, branching beach aster, and ocean bluff milkvetch. If other special-status plants, such as Menzies' wallflower, sand gilia, or other special-status plants listed in **Table 4.6-6**, are present within or adjacent to the project area, they could be directly or indirectly impacted by construction during the 6-month construction period as described above under the heading *Overview of Potential Construction Effects on Plants*, a significant impact.

Coast buckwheat (host plant for Smith's blue butterfly) occurs in high densities along the CEMEX access road and in the surrounding sand dunes in the CEMEX active mining area (Zander Associates, 2014), although few individuals were observed within the Source Water Pipeline alignment. If any life form of the butterfly is present on or around these host plants, removal of the plant would be a significant impact on Smith's blue butterfly. Additionally, installation of the Source Water Pipeline has potential to impact approximately 0.2 acre of Smith's blue butterfly habitat, a significant impact. This impact area overlaps with a portion of the new Desalinated Water Pipeline Smith's blue butterfly habitat impact area described below.

Western snowy plover are known to use the western portion of the Source Water Pipeline alignment year-round. This portion of the Source Water Pipeline alignment overlaps a portion of the subsurface slant well installation area, so the type of impact would be similar to impacts described above for the subsurface slant wells. Construction noise or activity associated with installation of the Source Water Pipeline during the western snowy plover breeding season could impact plovers by causing temporary flight of breeding birds and potentially permanent effects from nest abandonment or failure, which would be significant. Construction work within the western end of the proposed Source Water Pipeline would result in temporary habitat impacts (since the construction area would be returned to pre-construction conditions) to approximately

0.2 acre of potential habitat (some of this area may overlap with the impact area for the subsurface slant wells as described above), which would be a significant impact. The remainder of the Source Water Pipeline would be constructed away from the beach and foredunes where plovers typically nest and would not result in the temporary loss of plover habitat. Construction noise or activity during the wintering season could directly or indirectly impact individual birds, a significant impact. Construction activities may temporarily displace birds that typically winter along the beach near the western portion of the Source Water Pipeline. Habitat is available on the beach and in the dunes north and south of the project area for wintering use during construction. Although birds may be initially disturbed and temporarily displaced during construction, and there is some potential for nest abandonment and failure, the site would be returned to pre-construction conditions and birds would be able to utilize the site following construction. However, the net impact on the western snowy plover is anticipated to be significant.

A potential California tiger salamander breeding pond is located within 1.2 miles of the Source Water Pipeline alignment, and non-native grassland within 1.2 miles of a potential breeding pond provides potential California tiger salamander upland habitat. The Salinas River is located within one mile of the Source Water Pipeline and non-native grassland within one mile of the Salinas River provide potential California red-legged frog upland habitat. Construction of the Source Water Pipeline has potential to temporarily impact (the site would be restored following construction) approximately one acre of California tiger salamander and California red-legged frog upland habitat, a significant impact. If individual California red-legged frogs or California tiger salamanders are present, construction of the Source Water Pipeline could result in take of these individuals during the 6-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact. This impact area overlaps with the new Desalinated Water Pipeline and Castroville Pipeline.

Additionally, as described in Section 4.6.1.8, above, and as presented in **Table 4.6-6**, numerous other special-status wildlife species, including western burrowing owl and American badger, may inhabit non-native grassland, and black legless lizard, silver legless lizard, coast horned lizard may inhabit central dune scrub along this pipeline alignment. Coast Range newt may occur in non-native grassland. Special-status bats may roost within crevices underneath the Highway 1 overpass at the CEMEX access road and in trees within the alignment. Raptors such as red-tailed hawk, white-tailed kite, and loggerhead shrike, among others, could nest in trees and/or forage along both of these pipeline alignments. If black legless lizard, silvery legless lizard, coast horned lizard, Coast Range newt, burrowing owl, or American badger are present in suitable habitat in or around the pipeline alignment, special-status bats are roosting in or around the pipeline alignment, or special-status nesting birds are present in or around the pipeline alignment they could be directly or indirectly impacted by construction activities during the 6-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*.

Globose dune beetle has potential to occur within central dune scrub at the slant well site. If present, construction activities could degrade habitat for this species, which would be a significant impact.

Impacts of Source Water Pipeline construction on central dune scrub, which is habitat for the special-status plant species listed above, globose dune beetle, black legless lizard, silvery legless lizards, and coast horned lizard, are addressed in Impact 4.6-2. Impacts on special-status species during construction of the Source Water Pipeline as described above and as listed in **Table 4.6-6** would be significant. However, implementation of the following mitigation measures would ensure that impacts on special-status species at this site are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1d (Protective Measures for Western Snowy Plover)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly), 4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard)**, **4.6-1h (Avoidance and Minimization Measures for Western Burrowing Owl)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1j (Avoidance and Minimization Measures for American Badger)**, **4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, **4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.12-1b (General Noise Controls for Construction Equipment)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid, minimize, and compensate for impacts on the western snowy plover such as avoiding the breeding season, installing a visual construction barrier for work conducted adjacent to breeding habitat during the breeding season to reduce human disturbance to plovers, conducting pre-construction surveys to determine if plovers are present and implementing minimization measures to minimize construction impacts on plovers, if present, and compensating for habitat loss to mitigate for temporary and permanent loss of habitat; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on Smith's blue butterfly such as avoiding host plants to the extent feasible to avoid impacts to individuals, relocating host plants, duff, and/or soil that cannot be avoided, and providing compensatory mitigation for permanent impacts; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring measures to avoid and minimize impacts on western burrowing owl such as conducting pre-construction surveys to determine if owls are present requiring a no-disturbance buffer around nesting sites or occupied burrows, and potentially excluding wintering burrowing owls from the work area, and compensating for loss of habitat; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests and requiring a no-disturbance buffer around active nests if work is scheduled during the nesting season; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species such as cleaning tools and equipment before entering and leaving worksites, avoiding driving or operating equipment in weed-infested areas, and covering non-active stockpiles; requiring implementation of noise controls for construction equipment to reduce noise impacts on special-status wildlife species; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species.

The Source Water Pipeline using the optional alignment would impact approximately 0.2 acre of Smith’s blue butterfly habitat, approximately 0.2 acre of western snowy plover nesting habitat, and 0.1 acre of non-native grassland, which provides potential California tiger salamander and California red-legged frog upland habitat. The Source Water Pipeline using the optional alignment would generally result in the same type of impact as described for the Source Water Pipeline. The same impact conclusion and mitigation measures would apply to the Source Water Pipeline using the optional alignment as apply to the Source Water Pipeline.

New Desalinated Water Pipeline

The new Desalinated Water Pipeline is described in Section 3.2.3.3 of Chapter 3, Description of the Proposed Project. This facility would be located outside of the MBNMS. Installation of both the new Desalinated Water Pipeline and new Transmission Main is anticipated to take 15 months. Although not planned, nighttime installation of the new Desalinated Water Pipeline could be required to expedite the construction schedule. The construction footprint is approximately 35.4 acres. A portion of the construction footprint for the new Desalinated Water Pipeline overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, Castroville Pipeline, Castroville Pipeline using the optional alignment 1, and Castroville Pipeline using the optional alignment 2.

The segment of the new Desalinated Water Pipeline located between the intersection of Charles Benson Road and Del Monte Boulevard south to Marina Green Drive includes a mix of moderately disturbed central dune scrub, coyote brush scrub, non-native annual grassland, ice plant mats, ruderal, and developed roadways. The segment between Marina Green Drive and Reservation Road is largely dominated by ruderal areas, developed/landscaped areas, and ice plant mats and is surrounded by urban development. Some native communities, such as central dune scrub, coyote brush scrub, and coast live oak woodland, occur within this segment, but they are highly disturbed. Several Monterey cypress stands and eucalyptus groves also occur within the segment between Marina Green Drive and Reservation Road. Riparian woodland and scrub exists along the Desalinated Water Pipeline alignment at Locke-Paddon Park, near the intersection of Del Monte Boulevard and Reservation Road. Non-native grassland and agricultural land occur in the alignment north of Charles Benson Road.

Monterey spineflower and Kellogg's horkelia were observed in central dune scrub along Del Monte Boulevard during surveys conducted for the proposed project (ESA, 2012; 2016). Branching beach aster was observed along Del Monte Road within the pipeline alignment during protocol level plant surveys conducted for the proposed project in 2014 (URS, 2014b). As indicated in **Table 4.6-2**, a number of other special-status plants may also occur along this pipeline alignment. Construction of the Desalinated Water Pipeline has potential to disturb Monterey spineflower and Kellogg's horkelia, a significant impact. If other special-status plants, such as Menzies' wallflower, sand gilia, or other special-status plants listed in **Table 4.6-6**, are present in suitable habitat within or adjacent to the project area, they could be directly or indirectly impacted by construction activities during the 15-month (in conjunction with the new Transmission Main) construction period as described above under the heading *Overview of Potential Construction Effects on Plants*, a significant impact.

A few small patches (approximately 0.2 acre in extent) of coast buckwheat (host plant for Smith's blue butterfly) occur within the new Desalinated Water Pipeline alignment (AECOM, 2016). If any life form of the butterfly is present on or around these host plants, removal of the plant would be a significant impact on Smith's blue butterfly. Additionally, installation of the new Desalinated Water Pipeline has potential to impact approximately 0.2 acre of Smith's blue butterfly habitat, a significant impact. This impact area overlaps with a portion of the Source Water Pipeline Smith's blue butterfly habitat impact area described above.

Two potential California tiger salamander breeding ponds are located within 1.2 miles of the new Desalinated Water Pipeline alignment and non-native grassland within 1.2 miles of a potential breeding pond provides potential California tiger salamander upland habitat. Additionally, the Salinas River and another potential breeding pond are located within 1.2 miles of the new Desalinated Water Pipeline. Non-native grassland within 1.2 miles of the Salinas River and the potential breeding pond provide potential California red-legged frog upland habitat. Construction of the new Desalinated Water Pipeline has potential to temporarily impact (the site would be restored following construction) approximately 1.4 acre of California tiger salamander and California red-legged frog upland habitat, which is a significant impact. If individual California red-legged frogs or California tiger salamanders are present, construction of the new Desalinated Water Pipeline could directly or indirectly impact these individuals during the 15-month (in conjunction with the new Transmission Main) construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact. Much of this impact area overlaps with the Source Water Pipeline and Castroville Pipeline.

As presented in **Table 4.6-6**, numerous special-status wildlife species including Coast Range newt, western burrowing owl, and American badger may occur in non-native grassland and black legless lizard, silvery legless lizard, and coast horned lizard may inhabit central dune scrub along the pipeline alignment. Riparian woodland and scrub located adjacent to the pond at Locke-Paddon Park and along the alignment has the potential to support western pond turtle and tricolored blackbird. Raptors such as red-tailed hawk, white-tailed kite, and loggerhead shrike, among others, could nest in trees and/or forage along the pipeline alignment. Special-status bats could roost in trees within the alignment. Salinas kangaroo rat has potential to occur in grassland or scrub habitat and this species is considered sensitive in the coastal zone within the City of Marina. If burrowing owl, American badger, black legless lizard, silvery legless lizard, coast horned lizard, Coast Range newt, western pond turtle, tricolored blackbird, special-status nesting birds, special-status bats, or Salinas kangaroo rat are present in or around the alignment, they could be directly or indirectly impacted by construction activities during the 15-month (in conjunction with the new Transmission Main) construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife.*

Impacts of new Desalination Water Pipeline construction on central dune scrub, which is habitat for the special-status plant species listed above, black legless lizard, silvery legless lizard, and coast horned lizard, and on riparian woodland and scrub, which is habitat for tricolored blackbird and western pond turtle, are addressed in Impact 4.6-2.

Impacts on special-status species during construction of the new Desalinated Water Pipeline would be significant. However, implementation of the following mitigation measures would ensure that impacts on special-status species at this site are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly), 4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard)**, **4.6-1h (Avoidance and Minimization Measures for Western Burrowing Owl)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1j (Avoidance and Minimization Measures for American Badger)**, **4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, **4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander)**, **4.6-1p (Control Measures for Spread of Invasive Plants)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on Smith's blue butterfly such as avoiding host plants to the extent feasible to avoid impacts to individuals, relocating host plants, duff, and/or soil that cannot be avoided, and providing compensatory mitigation for permanent impacts; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring measures to avoid and minimize impacts on western burrowing owl such as conducting pre-construction surveys to determine if owls are present, requiring a no-disturbance buffer around nesting sites or occupied burrows, and potentially excluding wintering burrowing owls from the work area, and compensating for loss of habitat; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests and requiring a no-disturbance buffer around active nests if work is scheduled during the nesting season; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species such as cleaning tools and equipment before entering and leaving worksites, avoiding driving or operating equipment in weed-infested areas, and covering non-active stockpiles; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species.

The new Desalinated Water using the optional alignment would impact approximately 0.2 acre of Smith's blue butterfly habitat and approximately 0.5 acre of non-native grassland, which provides potential California tiger salamander and California red-legged frog upland habitat. The new Desalinated Water Pipeline using the optional alignment would result in the same type of impact as described for the new Desalinated Water Pipeline. The same impact conclusion and mitigation measures would apply to the new Desalinated Water Pipeline using the optional alignment as apply to the new Desalinated Water Pipeline.

Castroville Pipeline

Construction of the 4.5-mile-long Castroville Pipeline would take approximately 4 months. This facility would be located outside of the MBNMS. Nighttime installation of the Castroville Pipeline could be required to meet the construction schedule. The construction footprint is approximately 15.0 acres. A portion of the Castroville Pipeline construction footprint overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, new Desalinated Water Pipeline, and new Desalinated Water Pipeline using the optional alignment.

The alignment north of and parallel to, Charles Benson Road includes non-native annual grassland and agricultural land bordered on the south by Monterey cypress and eucalyptus trees. North of Charles Benson Road the alignment traverses developed areas, ruderal areas, coyote brush scrub, and ice plant mats with a few isolated patches of central dune scrub and non-native grassland before crossing through agricultural, ruderal, and developed areas until it reaches the Salinas River. The Salinas River includes open water and adjacent riparian woodland and scrub, coyote brush scrub, and northern coastal scrub communities. North of the Salinas River the alignment includes mostly agricultural, developed, and ruderal areas until it crosses over Tembladero Slough. North of Tembladero Slough, the alignment passes through a mix of agricultural, developed, ruderal, coyote brush scrub, riparian woodland and scrub and freshwater marsh communities before continuing back to developed and ruderal areas.

Monterey spineflower and branching beach aster were observed in and around central dune scrub north of the intersection of Del Monte Boulevard and Charles Benson Road during surveys conducted for the proposed project (AECOM, 2016). As indicated in **Table 4.6-2**, a number of other special-status plants may also occur along this pipeline alignment. Construction of the Castroville Pipeline has potential to disturb Monterey spineflower and branching beach aster, a significant impact. If other special-status plants, such as Menzies' wallflower, sand gilia, or other special-status plants listed in **Table 4.6-6**, are present in suitable habitat within or adjacent to the project area, they could be directly or indirectly impacted by construction activities during the 4-month construction period as described above under the heading *Overview of Potential Construction Effects on Plants*, a significant impact.

The Salinas River, Tembladero Slough, and freshwater marsh and riparian woodland and scrub located north of Tembladero Slough provide potential California red-legged frog aquatic habitat. Construction of the Castroville Pipeline would be installed on the underside of an existing bridge over the Salinas River and beneath Tembladero Slough and construction would not occur within these areas. Pipeline construction would temporarily impact 0.9 acre of riparian woodland and scrub, which is potential aquatic habitat. Non-native grassland in the southern end of the Castroville Pipeline alignment is located within 1.2 miles of potential California tiger salamander and California red-legged frog breeding areas. This non-native grassland would provide upland habitat for California tiger salamander and California red-legged frog. Construction of the Castroville Pipeline has potential to temporarily impact approximately 1.1 acres of California tiger salamander and California red-legged frog upland habitat, which is a significant impact. Much of this impact area overlaps with the Source Water Pipeline and new Desalinated Water Pipeline. Temporary impacts on California tiger salamander and California red-legged frog habitat would be significant.

If individual California red-legged frog or California tiger salamander are present, construction of the Castroville Pipeline could directly or indirectly impact these individuals during the 4-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact. As discussed under Impact 4.3-1 in Section 4.3, Surface Water Hydrology and Water Quality, project construction activities that disturb more than 1 acre are subject to the NPDES Construction General Permit requirements. Per the requirements, a SWPPP would be prepared by a Qualified SWPPP Developer and a Qualified SWPPP Practitioner would oversee its implementation. The SWPPP, which would include site-specific erosion and stormwater control measures to be implemented during construction of the Castroville Pipeline, would reduce or eliminate the offsite migration of pollutants and sediment. Mandatory compliance with the NPDES Construction General Permit would avoid substantial adverse effects on water quality in the Salinas River and Tembladero Slough. Thus, the indirect impacts on California red-legged frog habitat in the Salinas River and Tembladero Slough would be less than significant and no mitigation is necessary.

Steelhead are known from the Salinas River and have potential to occur in Tembladero Slough. The proposed Castroville Pipeline would be installed on the underside of the existing bridge over the Salinas River and beneath Tembladero Slough using HDD. There would be no construction within the Salinas River or Tembladero Slough from construction and therefore, no direct impacts on steelhead from construction. Grubbing and excavation of vegetated areas would be required at two small areas on the north and south end of the elevated portion of the proposed pipeline crossing over the Salinas River in addition to riparian vegetation trimming along the pipeline installation route. The entry and exit pits for the crossing beneath Tembladero Slough would be located at least 40 feet from Tembladero Slough. Soil disturbing activities from installation of the Castroville Pipeline in the vicinity of the Salinas River and Tembladero Slough could result in soil erosion and the migration of eroded soil and sediment downgradient towards the water features. Mandatory compliance with the NPDES Construction General Permit and implementation of the SWPPP would prevent indirect impact on steelhead habitat in the Salinas River and Tembladero Slough from upland soil erosion. Although not anticipated, there is potential for frac-outs[19] to occur using HDD. If a frac-out occurs, bentonite slurry could be released into Tembladero Slough, which could degrade water quality and adversely impact steelhead habitat and/or individual fish by increasing suspended sediments that may inhibit fish respiration and degrade habitat, a significant impact. The pipeline would be installed on the bridge over the Salinas River from a temporary barge that would be in place for no more than one month. The bridge currently provides shade over the Salinas River and the barge would be relatively small compared to the larger unshaded Salinas River and would be used for a short time period, so impacts from the barge would be less than significant.

As presented in **Table 4.6-6**, numerous special-status wildlife species including American badger may occur in non-native grassland and black legless lizard, silver legless lizard, and coast horned lizard may inhabit central dune scrub along the pipeline alignment. Coast Range newt may occur in aquatic habitat and adjacent upland and grassland areas. Riparian woodland and scrub located north of Tembladero Slough has the potential to support western pond turtle. Special-status

[19] A frac-out, or hydrofracture, is the inadvertent loss of drilling fluid from the borehole to the surrounding soil, surface, or waterbody, as a result of excess fluid pressure during directional drilling.

raptors such as red-tailed hawk, white-tailed kite, and loggerhead shrike, among others, could potentially nest in trees and/or forage along the pipeline alignment. Special-status bats could roost in trees within the alignment. If black legless lizard, silvery legless lizard, coast horned lizard, Coast Range newt, American badger, western pond turtle, or special-status nesting birds or bats are present in or around the alignment, they could be directly or indirectly impacted by construction activities during the 4-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*.

Impacts of Castroville Pipeline construction on central dune scrub, which is habitat for black legless lizard, silvery legless lizard, and coast horned lizard, and on riparian woodland and scrub, which is habitat for western pond turtle, are addressed in Impact 4.6-2.

Impacts on special-status species during construction of the Castroville Pipeline would be significant. However, implementation of the following mitigation measures would ensure that impacts on special-status species at this site are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1j (Avoidance and Minimization Measures for American Badger)**, **4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, **4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander)**, **4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-1q (Frac-out Contingency Plan)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures)**.

These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests and requiring a no-disturbance buffer around active nests if work is scheduled during the nesting season; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species such as cleaning tools and equipment before entering and leaving worksites, avoiding driving or operating equipment in weed-infested areas, and covering non-active stockpiles; requiring preparation of a Frac-out Contingency Plan and implementation of measures in the Plan to contain and clean-up any frac-outs in waterways to minimize impacts of frac-outs on special-status species and their habitat; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species.

The Castroville Pipeline using the optional alignment 1 would temporarily impact (the site would be returned to pre-construction conditions following construction) approximately 0.9 acre of riparian woodland and scrub and 0.01 acre of freshwater marsh and between approximately 1 and 2 acres of non-native grassland, which provides potential California tiger salamander and California red-legged frog upland habitat. The Castroville Pipeline using the optional alignment 2 would temporarily impact approximately 0.9 acre of riparian woodland and scrub and 0.1 acre of non-native grassland. However, the same impact conclusion and mitigation measures would apply to the Castroville Pipeline using both optional alignments as the Castroville Pipeline.

Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond

Construction of the 1-mile-long Brine Discharge Pipeline would be completed in approximately 3 months and construction of the 1.2-mile-long Pipeline to CSIP Pond would be completed in approximately 2 months. The Brine Mixing Box would be completed in approximately 6 months. These facilities would be located outside of the MBNMS. Nighttime construction may be required to expedite construction. The construction footprint for both of these pipelines and the Brine Mixing Box combined is approximately 7.4 acres, including the Brine Mixing Box construction staging area.

The Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond would be installed in paved access roads and ruderal areas, and non-native grassland. The pipeline alignments are located adjacent to ornamental Monterey cypress stands present along the access roads.

Table 4.6-2 presents the potential for special-status plant and wildlife species to occur along the Brine Discharge Pipeline and Pipeline to CSIP Pond alignments and the Brine Mixing Box footprint, and **Table 4.6-6** identifies the special-status plant and wildlife species that could be significantly impacted by project-related construction activities. As indicated in **Table 4.6-2**, special-status plants either have a low potential to occur or are not expected to occur along these construction footprints; therefore, as indicated in Table 4.6-6, no potentially significant impact on special-status plants would result.

A potential California tiger salamander breeding pond is located within 1.2 miles of the Brine Discharge Pipeline and Pipeline to CSIP Pond alignments and non-native grassland within 1.2 miles of a potential breeding pond provides potential California tiger salamander upland habitat. The Salinas River is located within 1 mile of the Brine Discharge Pipeline and Pipeline to CSIP Pond and non-native grassland within 1 mile of the Salinas River provide potential California red-legged frog upland habitat. Construction of the Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond has potential to permanently impact approximately 0.4 acre and temporarily impact approximately 0.4 acre each of California tiger salamander and California red-legged frog upland habitat, which is a significant impact. Coast Range newt also has potential to occur in grassland areas. If individual California red-legged frogs, California tiger salamanders, or Coast Range newt are present, construction of the Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond could directly or indirectly impact these individuals during the 2-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact.

Planted Monterey cypress trees on the west side of the MRWPCA's access road provide roosting, foraging, and/or nesting opportunities for a variety of raptors and other birds and roosting habitat for special-status bats. Although these trees are not expected to be removed during pipeline installation activities, due to the proximity of construction, if raptors or special-status nesting passerines or roosting special-status bats are present during construction in or around the project area, construction activities could result in direct or indirect impacts on these species during the 2-month construction period as described under the heading *Overview of Potential Construction Effects on Wildlife*, which would result in a significant impact. Non-native grassland within the MRWPCA Regional Wastewater Treatment Plant site may provide nesting habitat for common passerines protected by the MBTA. If nesting birds are present within the grassland, they could be directly or indirectly impacted by construction activities, which would be a significant impact.

Implementation of the following mitigation measures would ensure that impacts on special-status species at this site would be reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests and requiring a no-disturbance buffer around active nests if work is scheduled during the nesting season; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species.

Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline)

The proposed ASR Facilities are described in Chapter 3, Description of the Proposed Project, Section 3.2.4. These facilities include the ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline. These facilities would be located outside of the MBNMS. Each ASR well would be housed in a permanent 900-square foot concrete pump house. Chain-link fencing would encompass an approximately 0.4-acre and 0.5-acre area around the ASR-5 and ASR-6 Wells, respectively. Therefore, the construction footprint for both of the ASR Wells is expected to be approximately 0.9 acre. Water produced during development of the wells would be conveyed to a 1.4-acre natural depression located east of the intersection of San Pablo Avenue and General Jim Moore Boulevard and percolated into the ground. The construction footprint of the area where water would be conveyed is approximately 7.0 acres. Three parallel 0.9-mile-long, 30-inch-diameter ASR pipelines (ASR Recirculation Pipeline, ASR Conveyance Pipeline, and ASR Pump-to-Waste Pipeline) would extend along General Jim Moore Boulevard between the proposed ASR-5 and ASR-6 Wells at the Fitch Park military housing area and Coe Avenue/General Jim Moore Boulevard. The construction footprint for all three ASR pipelines is approximately 8.8 acres. A portion of the construction footprint for the ASR pipelines overlaps with a portion of the construction footprints for the new Transmission Main and the new Transmission Main using the optional alignment. Installation of the ASR pipelines would occur during daytime hours. Construction of the ASR-5 and ASR-6 wells would require nighttime construction.

The ASR-5 and ASR-6 Well sites contain a mix of coast live oak woodland, coyote brush scrub, and ruderal areas surrounded by single family residences. The ASR pipelines would be installed within developed General Jim Moore Boulevard, but are surrounded by a mix of single family residences and moderately disturbed coast live oak woodland, coyote brush scrub, ice plant mats, and ruderal areas, in the north with a border of undisturbed northern coastal scrub and coast live oak woodland on former Fort Ord lands at the southern end of the pipeline alignment. The area where water produced during development of the ASR-5 and ASR-6 wells would be conveyed is located on former Fort Ord lands and contains a mix of central maritime chaparral and ruderal areas.

Kellogg's horkelia has been observed within the development water infiltration area that will be used during development of the ASR-5 and ASR-6 Wells (CDFW, 2016). Monterey spineflower, Kellogg's horkelia, and Monterey ceanothus were observed along the ASR pipeline alignment during reconnaissance surveys and focused botanical surveys of the project area along General Jim Moore Boulevard (ESA, 2016; AECOM, 2016). As indicated in **Table 4.6-2**, there are several other special-status plant species that have a moderate to high potential to occur in or adjacent to the proposed ASR Facilities including robust spineflower, seaside birds-beak, sand gilia, Yadon's rein orchid, Hooker's manzanita, Toro manzanita, Pajaro manzanita, sandmat manzanita, ocean bluff milkvetch, Monterey Coast paintbrush, Eastwood's goldenbush, sand-loving wallflower, Carmel Valley bush-mallow, northern curly-leaved monardella, south coast branching phacelia, Michael's rein orchid, and others listed in **Table 4.6-2**. Installation of the ASR Facilities could result in direct or indirect impacts on special-status plant species during the 5-month construction period for the ASR pipelines and 12-month construction period for the ASR wells as described above under the heading *Overview of Potential Construction Effects on Plants* (see **Table 4.6-6** for a complete list of special-status species that could be significantly impacted by construction of the proposed ASR facilities).

Special-status wildlife with a moderate to high potential to occur at the ASR Facilities include silvery legless lizard, black legless lizard, coast horned lizard, Coast Range newt, red-tailed hawk, and Monterey dusky-footed woodrat. See **Table 4.6-2** for a complete list of special-status wildlife species and their potential to occur at the ASR facilities sites. If black legless lizard, silvery legless lizard, coast horned lizard, Coast Range newt, Monterey dusky-footed woodrat, Monterey shrew, or American badger are present in the construction area, or if raptors or other special-status nesting passerines or roosting special-status bats are present within or in close proximity to the construction area, those species could be directly or indirectly impacted by construction activities during the 5-month construction period for the ASR pipelines and 12-month construction period for the ASR wells as described above under the heading *Overview of Potential Construction Effects on Wildlife*.

Impacts to coast live oak woodland and central maritime chaparral, which are habitats for one or more of the special-status species listed above (including special-status plants, black legless lizard, silvery legless lizards, coast horned lizard, Coast Range newt, Monterey dusky-footed woodrat, Monterey shrew, and American badger) at this facility, is addressed in Impact 4.6-2. Substantial adverse effects on special-status species during construction of the ASR facilities, as described above, would result in a significant impact. Implementation of the following mitigation measures would reduce impacts on special-status species at this site to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1j (Avoidance and**

Minimization Measures for American Badger), **4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat)**, **4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, **4.6-1p (Control Measures for Spread of Invasive Plants)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests and requiring a no-disturbance buffer around active nests if work is scheduled during the nesting season; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on Monterey dusky-footed woodrat such as relocating active nests within the construction area to areas outside of the construction area to minimize impacts to individual woodrats from construction activities; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species such as cleaning tools and equipment before entering and leaving worksites, avoiding driving or operating equipment in weed-infested areas, and covering non-active stockpiles; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species.

Pipelines and Other Conveyance Facilities South of Reservation Road

New Transmission Main and New Transmission Main Optional Alignment

The new Transmission Main and new Transmission Main Optional alignments are described in Chapter 3, Description of the Proposed Project, Section 3.2.3.4. This facility would be located outside of the MBNMS. This 6-mile-long, 36-inch-diameter pipeline would extend from the Desalinated Water Pipeline at the intersection of Del Monte Boulevard and Reservation Road south to the existing Phase I ASR Facilities near the intersection of General Jim Moore and Coe Avenue. Construction of this pipeline and the new Desalinated Water Pipeline would take approximately 15 months to complete. Similar to the other pipelines, construction activities would occur during the daytime hours, except at a few locations where nighttime construction would be required to meet the project schedule. The construction footprint is approximately 27.1 acres. A portion of the new Transmission Main construction footprint overlaps with a portion of the ASR pipelines construction footprint.

As described in Section 4.6.1.10, habitat along the new Transmission Main alignment is variable and includes ice plant mats and ruderal areas with a few Monterey cypress stands and eucalyptus groves, central dune scrub along the back dunes of Fort Ord Dunes State Park, coyote brush scrub, and coast live oak woodland with some areas of northern coastal scrub in inland areas.

Table 4.6-2 presents the potential for special-status plant and wildlife species to occur along the new Transmission Main alignment, and **Table 4.6-6** identifies the special-status plant and wildlife species that could be significantly impacted by project-related construction activities. As indicated in **Table 4.6-2**, Sandmat manzanita, Monterey spineflower, Menzies' wallflower, Kellogg's horkelia, Monterey Coast paintbrush, branching beach aster, south coast branching phacelia, Michael's rein orchid, and Monterey ceanothus have been observed along the alignment (ESA, 2013; USACE, 1997; Fort Ord Reuse Authority, 2012; CDFW, 2016; Denise Duffy & Associates, 2013; and URS, 2016) and construction of the Transmission Main could result in direct and indirect impacts on these species during the 15-month construction period (in conjunction with the new Desalinated Water Pipeline) as described above under the heading *Overview of Potential Construction Effects on Plants*, a significant impact. Additionally, a number of other special-status plant species could occur within the alignment and, if present, could be directly or indirectly impacted by construction, which is a significant impact.

Coast buckwheat occurs along the alignment (ESA, 2013) and could support Smith's blue butterfly. If any life form of Smith's blue butterfly is present, removal or destruction of coast buckwheat and associated soil could result in injury or loss of Smith's blue butterfly. Construction of the new Transmission Main would temporarily impact approximately 0.3 acre of Smith's blue butterfly habitat. These impacts on Smith's blue butterfly would be significant. Although the habitat would only be temporarily impacted, because the site would be returned to pre-construction conditions, construction could result in the permanent loss of the host plant, a significant impact.

Black legless lizard, silvery legless lizard, coat horned lizard, Coast Range newt, western burrowing owl, American badger, tricolored blackbird, Salinas kangaroo rat, Monterey dusky-footed woodrat, and Monterey shrew could occur along, or in the vicinity of, the alignment. Additionally, raptors and other birds protected by the MBTA could nest where suitable habitat occurs along the alignment. Special-status bats have some potential to roost within crevices underneath the Highway 1 overpass and in trees within the alignment. If present, these species could be directly or indirectly impacted by construction activities during the 15-month construction period (in conjunction with the new Desalinated Water Pipeline) as described above under the heading *Overview of Potential Construction Effects on Wildlife*. The impact on these special-status wildlife species is considered significant.

Impacts to sensitive natural communities, which are habitat for the special-status plant species listed above, black legless lizard, silvery legless lizards, coast horned lizard, and Coast Range newt, at this facility is addressed in Impact 4.6-2.

The overall construction-related impact on special-status plant and wildlife species during construction of the new Transmission Main would be significant. However, implementation of the following mitigation measures would ensure that these impacts are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly)**, **4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard)**, **4.6-1h (Avoidance and Minimization Measures for Western Burrowing Owl)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1j (Avoidance and Minimization Measures for American Badger)**, **4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat), 4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, **4.6-1p (Control Measures for Spread of Invasive Plants)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on Smith's blue butterfly such as avoiding host plants to the extent feasible to avoid impacts to individuals, relocating host plants, duff, and/or soil that cannot be avoided, and providing compensatory mitigation for permanent impacts; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring measures to avoid and minimize impacts on western burrowing owl such as conducting pre-construction surveys to determine if owls are present, requiring a no-disturbance buffer around nesting sites or occupied burrows, and potentially excluding wintering burrowing owls from the work area, and compensating for loss of habitat; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests and requiring a no-disturbance buffer around active nests if work is scheduled during the nesting season; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on Monterey dusky-footed woodrat such as relocating active nests within the construction area to areas outside of the construction area to minimize impacts to individual woodrats from construction activities; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species such as cleaning tools and equipment before entering and leaving worksites, avoiding driving or operating equipment in weed-infested areas, and covering non-active stockpiles; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species.

Since the new Transmission Main and new Transmission Main using the optional alignment would impact the same special-status species, the same impacts and mitigation measures would apply to the new Transmission Main using the optional alignment as apply to the new Transmission Main.

Carmel Valley Pump Station

The proposed Carmel Valley Pump Station is described in Section 3.2.3.8 of Chapter 3, Description of the Proposed Project. This facility would be located outside of the MBNMS.

The pump station would be enclosed within a 500-square-foot single-story building and a 100-square-foot electrical control building would be constructed outside of the pump station building. This pump station also includes an inlet and outlet pipeline that connects the pump station to Carmel Valley Road. Construction would take approximately 6 months to complete and would occur during daytime hours only. The construction footprint for the pump station and associated pipelines is approximately 0.2 acre.

The site includes non-native annual grassland, landscaped, and developed areas bordered by coast live oak woodland.

Special-status species that could be significantly impacted during construction of the Carmel Valley Pump Station are listed in **Table 4.6-6**. They include California red-legged frog, Monterey pine, Coast Range newt, red-tailed hawk, red-shouldered hawk, white-tailed kite, American peregrine falcon, American kestrel, loggerhead shrike, pallid bat, western red bat, Monterey dusky-footed woodrat, and Monterey shrew. If Monterey pines are located at the site, they may be part of a native stand, which is considered special-status. If a native Monterey pine stand is present within or adjacent to the construction area, it could be directly or indirectly impacted by construction activities during the 6-month construction period as described above under the heading *Overview of Potential Construction Effects on Plants*, a significant impact.

California red-legged frogs are known to breed in the Carmel River and small tributaries and backpools in the vicinity of the proposed Carmel Valley Pump Station (CDFW, 2016). Non-native grassland at the site provides potential upland habitat for this species. If California red-legged frog are present at the site, construction of the Carmel Valley Pump Station could directly or indirectly impact these individuals during the 6-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact. Additionally, construction activities would temporarily impact 0.04 acre and permanently impact 0.08 acre of upland habitat, which is a significant impact.

Additionally, raptors, such as red-tailed hawk or red-shouldered hawk, and birds protected under the MTBA and California Fish and Game Code may nest in trees that border the boundary of site. Special-status bats may also roost in trees adjacent to the construction area. Monterey dusky-footed woodrat and Monterey shrew may occur in the adjacent coast live oak woodland understory. Coast Range newt could occur in grassland or adjacent oak woodland. If these species are present in the construction area, construction could directly or indirectly impact these species during the 6-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, which would be a significant impact. This impact would be inclusive of construction noise which, as stated in Section 4.12 Noise and Vibration, could generate noise levels more than 15 dBA above existing ambient noise levels.

However, implementation of the following mitigation measures would ensure that impacts on special-status species at this site are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat), 4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1m (Avoidance and Minimization Measures for Native Stands of Monterey Pine)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, and **4.6-1o (Avoidance and Minimization Measures for California Red-legged frog and California Tiger Salamander)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests and requiring a no-disturbance buffer around active nests if work is scheduled during the nesting season; requiring measures to avoid and minimize impacts on Monterey dusky-footed woodrat such as relocating active nests within the construction area to areas outside of the construction area to minimize impacts to individual woodrats from construction activities; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; requiring measures to avoid and minimize impacts on native stands of Monterey Pines such as avoiding any stands present to avoid tree loss and replacing trees that cannot be avoided to compensate for any loss; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; and requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts.

Ryan Ranch-Bishop Interconnection Improvements

The proposed Ryan Ranch–Bishop Interconnection Improvements are described in Section 3.2.3.11 of Chapter 3, Description of the Proposed Project. This facility would be located outside of the MBNMS. The 1.1-mile-long, 8-inch-diameter Ryan Ranch–Bishop Interconnection Improvements pipeline would extend between an existing interconnection at Highway 68 and Ragsdale Avenue and a new connection to the Bishop system. Construction of the Ryan Ranch–Bishop Interconnection Improvements would occur during daytime hours and would take approximately 4 months to complete. The construction footprint is approximately 7.3 acres.

The proposed Ryan Ranch–Bishop Interconnection Improvements would be located within a business park area with existing stands of coast live oak woodland, northern coastal scrub, and non-native grassland interspersed throughout the developed areas. In general, construction disturbance would be limited to the road right-of-ways; however, there is an area of non-native grassland adjacent to the roadway where disturbance would occur.

Special-status species that could be significantly impacted during construction of the Ryan Ranch–Bishop Interconnection Improvements are indicated in **Table 4.6-6**. Although construction-related disturbance would be largely limited to the paved roadways, some special-status plant species could occur in coast live oak woodland adjacent to the construction area or non-native grassland within or adjacent to the construction area, including Hickman’s onion, Toro manzanita, Michael’s rein orchid, and native stands of Monterey pine. If these special-status plant species, or others listed in **Table 4.6-6**, occur within or adjacent to the construction disturbance areas, these plants could be directly or indirectly impacted by construction activities during the 4-month construction period as described above under the heading *Overview of Potential Construction Effects on Plants*. This would be a significant impact.

Although California tiger salamander breeding habitat is absent from the site, California tiger salamander breeding ponds are known within 1 mile of the Ryan Ranch–Bishop Interconnection Improvements (CDFW, 2016); thus, salamander could occur in upland habitat at the site. California red-legged frog aquatic habitat is absent from site, however, this frog is known to breed within the

Carmel River (CDFW, 2016) and could occur in grassland within the construction areas or other suitable upland habitat adjacent to construction area while dispersing. Construction activities would temporarily impact approximately 0.5 acre of California tiger salamander and California red-legged frog upland habitat. If these species are present they could be directly or indirectly impacted by construction activities during the 4-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact.

Additionally, Coast Range newt, Monterey dusky-footed woodrat, Monterey shrew, and/or American badger could occur in suitable habitat within or adjacent to the Ryan Ranch–Bishop Interconnection Improvements site. Special-status nesting birds and bats could also occur within or adjacent to site. If these species, or others listed in **Table 4.6-6** are present, they could be directly or indirectly impacted by construction activities during the 4-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact.

Construction-related impacts on special-status plant and animal species during construction of the Ryan Ranch-Bishop Interconnection Improvements would be significant (see **Table 4.6-6** for a complete list of special-status species that would be significantly impacted). However, implementation of the following mitigation measures would reduce impacts on special-status species to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds), 4.6-1j (Avoidance and Minimization Measures for American Badger)**, **4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat)**, **4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1m (Avoidance and Minimization Measures for Native Stands of Monterey Pine)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, and **4.6-1o (Avoidance and Minimization Measures for California Red-legged frog and California Tiger Salamander)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests and requiring a no-disturbance buffer around active nests if work is scheduled during the nesting season; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on Monterey dusky-footed woodrat such as relocating active nests within the construction area to areas outside of the construction area to minimize impacts to individual woodrats from construction activities; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; requiring measures to avoid and minimize impacts on native stands of Monterey Pines such as avoiding any stands present to avoid tree loss and replacing trees that cannot be avoided to compensate for any loss; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; and requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts.

Main System-Hidden Hills Interconnection Improvements

The proposed Main System-Hidden Hills Interconnection Improvements are described in Section 3.2.3.11 of Chapter 3, Description of the Proposed Project. This facility would be located outside of the MBNMS. The existing interconnection between the main CalAm distribution system and the Hidden Hills system would be improved by installing approximately 1,200 feet of 6-inch-diameter pipeline along the northern extent of Tierra Grande Drive. Additionally, the existing pump capacity at the Upper Tierra Grande Booster Station and the Middle Tierra Grande Booster Station would be upgraded. Construction of the Main System-Hidden Hills Interconnection Improvements would occur during daytime hours and would take approximately 3 months to complete. The construction footprint for the Main System-Hidden Hills Interconnection Improvements is 1.1 acre.

The Main System–Hidden Hills Interconnection Improvements site is located in a low-density residential area. Construction disturbance would be limited to the road right-of-way and within the existing developed booster stations, but coast live oak woodland, Monterey pine woodland, and northern coastal scrub occur adjacent to the developed areas.

Special-status species that could be significantly impacted during construction of the Main System-Hidden Hills Interconnection Improvements are indicated in **Table 4.6-6**. Although construction-related disturbance would be limited to the paved roadways and existing facilities, some special-status plant species could occur in coast live oak woodland, non-native grassland, or northern coastal scrub adjacent to the developed areas, including Yadon’s rein orchid, Hickman’s onion, Toro manzanita, Michael’s rein orchid, and native stands of Monterey pine. If these special-status plant species, or others listed in **Table 4.6-6**, occur within or adjacent to the construction disturbance areas, they could be directly or indirectly impacted by construction activities during the 3-month construction period as described above under the heading *Overview of Potential Construction Effects on Plants*. This would be a significant impact.

Similarly, if California red-legged frog, California tiger salamander, or Coast Range newt are dispersing through suitable habitat adjacent to the work area during construction; if Monterey dusky-footed woodrat, Monterey shrew, or American badger are located in suitable habitat adjacent to the construction area; if raptors or special-status nesting passerines, roosting special-status bats, or other special-status wildlife species listed in **Table 4.6-6**, are present within or adjacent to the construction work area, they could be directly or indirectly impacted by construction activities during the 3-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, which would be a significant impact.

Implementation of the following mitigation measures would reduce impacts on special-status species to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds), 4.6-1j (Avoidance and Minimization Measures for American Badger)**, **4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat)**, **4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1m (Avoidance and Minimization Measures for Native Stands of Monterey Pine)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)** and **4.6-1o (Avoidance and Minimization Measures for California Red-legged frog and California Tiger Salamander)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests and requiring a no-disturbance buffer around active nests if work is scheduled during the nesting season; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on Monterey dusky-footed woodrat such as relocating active nests within the construction area to areas outside of the construction area to minimize impacts to individual woodrats from construction activities; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; requiring measures to avoid and minimize impacts on native stands of Monterey Pines such as avoiding any stands present to avoid tree loss and replacing trees that cannot be avoided to compensate for any loss; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts.

Staging Areas

There are eight staging areas located throughout the project area. **Table 4.6-3** in Section 4.6.1.10 lists the location of each staging area, a description of the site, habitat types present, and the special-status species with potential to occur within or adjacent to the staging areas. These facilities would be located outside of the MBNMS. The majority of the staging areas are located within developed or highly disturbed areas. However, there is potential for special-status species to occur in the vicinity of each of the staging area as listed in **Table 4.6-3**.

These special-status species include California tiger salamander, California red-legged frog, black legless lizard, silvery legless lizard, Coast Range newt, special-status plants, Smith's blue butterfly, Salinas kangaroo rat, nesting birds, roosting bats, and others listed in **Table 4.6-2**.

Special-status species that could be significantly impacted during use of the staging areas are indicated in **Table 4.6-6**. Although construction-related disturbance would be limited to the developed or highly disturbed areas, some special-status plant species could occur in areas adjacent to the developed and disturbed areas, including, but not limited to, Monterey spineflower, branching beach aster, Kellogg's horkelia, and Monterey ceanothus. If these special-status plant species, or others listed in **Table 4.6-6**, occur within or adjacent to the construction disturbance areas, they could be directly or indirectly impacted by construction activities during the construction period as described above under the heading *Overview of Potential Construction Effects on Plants*. This would be a significant impact.

Similarly, if California red-legged frog, California tiger salamander, Salinas kangaroo rat, black legless lizard, Coast Range newt, or Smith's blue butterfly are located in suitable habitat adjacent to the construction area; if raptors or special-status nesting passerines, roosting special-status bats, or other special-status wildlife species listed in **Table 4.6-6**, are present within or adjacent to the construction work area, they could be directly or indirectly impacted by construction activities during the construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, which would be a significant impact.

Implementation of the following mitigation measures would reduce impacts on special-status species to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly), 4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless**

Lizard, and Coast Horned Lizard), 4.6-1h (Avoidance and Minimization Measures for Western Burrowing Owl), 4.6-1i (Avoidance and Minimization Measures for Nesting Birds), 4.6-1j (Avoidance and Minimization Measures for American Badger), 4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat), 4.6-1l (Avoidance and Minimization Measures for Special-status Bats), **4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander),** and **4.6-1p (Control Measures for Spread of Invasive Plants)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on Smith's blue butterfly such as avoiding host plants to the extent feasible to avoid impacts to individuals, relocating host plants, duff, and/or soil that cannot be avoided, and providing compensatory mitigation for permanent impacts; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring measures to avoid and minimize impacts on western burrowing owl such as conducting pre-construction surveys to determine if owls are present, requiring a no-disturbance buffer around nesting sites or occupied burrows, and potentially excluding wintering burrowing owls from the work area, and compensating for loss of habitat; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests and requiring a no-disturbance buffer around active nests if work is scheduled during the nesting season; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on Monterey dusky-footed woodrat such as relocating active nests within the construction area to areas outside of the construction area to minimize impacts to individual woodrats from construction activities; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; and requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species such as cleaning tools and equipment before entering and leaving worksites, avoiding driving or operating equipment in weed-infested areas, and covering non-active stockpiles.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP construction could be inconsistent with applicable regulatory requirements related to special-status species that were adopted for the purpose of avoiding or mitigating an environmental effect. Specifically, the project could be inconsistent with the FESA, Federal Migratory Bird Treaty Act, CESA, California Fish and Game Code, City of Marina General Plan Policies 4.112, 4.114, 4.115, 4.118, 4.119, and 2.10; City of Marina Local Coastal Land Use Plan Policies 25 and 26 and Planning Guideline entitled Rare and Endangered Species: Habitat Protection; City of Seaside Local Coastal Program Land Use Plan Policy NCR-CZ 1.1.C; Seaside Municipal Code Chapter 8.54; Monterey County Greater Monterey Peninsula Area Plan Policy GMP-3.9; Monterey County General Plan Policies OS-4.1, OS-5.1, OS-5.2, OS-5.4, OS-5.16, and OS-5.25; Monterey County North County Land Use Plan Policies 2.3.2.1, 2.3.2.10, 2.3.3.B6, 2.3.3.C2, NC-3.3, and NC-3.5 and Key Policy 4.3.4; Fort Ord Reuse Plan (Seaside) Biological Resource Policies A-4, B-1, D-1; and Fort Ord Reuse Plan (Monterey County) Biological Resource Policies A-9, B-1, D-1, which were established to avoid or mitigate special-status species impacts, respectively. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1d (Protective Measures for Western Snowy Plover), 4.6-1e (Avoidance and Minimization Measures for Special-status Plants), 4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly), 4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard), 4.6-1h (Avoidance and Minimization Measures for Western Burrowing Owl), 4.6-1i (Avoidance and Minimization Measures for Nesting Birds), 4.6-1j (Avoidance and Minimization Measures for American Badger), 4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat), 4.6-1l (Avoidance and Minimization Measures for Special-status Bats), 4.6-1m (Avoidance and Minimization Measures for Native Stands of Monterey Pine), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander), 4.6-1p (Control Measures for Spread of Invasive Plants), 4.6-1q (Frac-out Contingency Plan), 4.12-1b (General Noise Controls for Construction Equipment)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures)** would reduce impacts on special-status species by: designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid, minimize, and compensate for impacts on the western snowy plover such as avoiding the breeding season, installing a visual construction barrier for work conducted adjacent to breeding habitat during the breeding season to reduce human disturbance to plovers, conducting pre-construction surveys to determine if plovers are present and implementing minimization measures to minimize construction impacts on plovers, if present, and compensating for habitat loss to mitigate for temporary and permanent loss of habitat; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on Smith's blue butterfly such as avoiding host plants to the extent feasible to avoid impacts to individuals, relocating host plants, duff, and/or soil that cannot be avoided, and providing compensatory mitigation for permanent impacts; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring measures to avoid and minimize impacts on western burrowing owl such as conducting pre-construction surveys to determine if owls are present, requiring a no-disturbance buffer around nesting sites or occupied burrows, and potentially excluding wintering burrowing owls from the work area, and compensating for loss of habitat; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests and requiring a no-disturbance buffer around active nests if work is scheduled during the nesting season; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on Monterey dusky-footed woodrat such as relocating active nests within the construction area to areas outside of the construction area to minimize impacts to individual woodrats from construction activities; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; requiring measures to avoid and minimize impacts on native stands of Monterey Pines such as avoiding any stands present to avoid tree loss and replacing trees that cannot be avoided to compensate for any loss; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species such as cleaning tools and equipment before entering and leaving worksites, avoiding driving or operating equipment in weed-infested areas, and covering non-active stockpiles; requiring preparation of a Frac-out Contingency Plan and implementation of measures in the Plan to contain and clean-up any frac-outs in waterways to minimize impacts of frac-outs on special-status species and their habitat; requiring implementation of noise controls for construction equipment to reduce noise impacts on special-status wildlife species; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species. Therefore, with these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirements.

Impact Conclusion

Impacts on special-status species habitat are described for each project facility above; however, portions of the work areas for some facilities overlap with the work area for other facilities. This section includes a summary of the overall project impacts to special-status species habitat, which accounts for areas of overlap. Overall, construction of the entire proposed project has the potential to temporarily impact approximately 8.0 acres and permanently impact approximately 1.0 acre of potential western snowy plover habitat,[20] temporarily impact approximately 2.1 acres of Smith's blue butterfly habitat,[21] temporarily impact approximately 12.3 acres and permanently impact approximately 15.4 acres of California tiger salamander habitat, and temporarily impact approximately 13.3 acres and permanently impact approximately 15.5 acres of California red-legged frog habitat.

Construction activities associated with all proposed project facilities have the potential to result in significant impacts on special-status species. For all facilities, implementation of the proposed mitigation measures would reduce impacts on special-status species to a less-than-significant level.

Mitigation Measures

Mitigation measures provided below and in Impact 4.6-2 and Impact 4.6-3 include specific restoration and compensation requirements for temporary and permanent impacts for sensitive biological resources. **Table 4.6-7** below includes a summary of these restoration and compensation requirements.

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[20] Impact 4.6-1 analyzes impacts from construction activities on western snowy plover. Impacts from maintenance activities on western snowy plover habitat are analyzed in Impact 4.6-6. Maintenance of the subsurface slant wells every five years would result in the permanent loss of approximately 6 acres of potential western snowy plover habitat. This maintenance area is assumed to be located within the 8-acre temporary construction footprint. Therefore, the proposed project (including construction and maintenance) would result in a permanent impact to 7 acres (1 acre from construction and 6 acres from maintenance) and temporary impact to 2 acres (from construction) of western snowy plover habitat.

[21] Impact 4.6-1 analyzes impacts from construction activities on Smith's blue butterfly. Impacts from maintenance activities on Smith's blue butterfly habitat are analyzed in Impact 4.6-6. Maintenance of the subsurface slant wells every five years would result in the permanent loss of approximately 1.6 acre of Smith's blue butterfly habitat. This maintenance area is assumed to be located within the 1.6-acre temporary construction footprint for the subsurface slant wells. The proposed project (including construction and maintenance) would result in a permanent impact to 1.6 acre of Smith's blue butterfly habitat (from construction and maintenance of the subsurface slant wells) and temporary impact to 0.5 acre from construction of other facilities.

TABLE 4.6-7
SUMMARY OF TERRESTRIAL BIOLOGICAL RESOURCE MITIGATION MEASURE RESTORATION AND COMPENSATION REQUIREMENTS*

Resource	Temporary Impact Restoration and/or Compensation Requirements	Permanent Impact Compensation Requirements
Protected trees	N/A	As required by local plans, policies, and ordinances as listed in Table 4.6-10
Western burrowing owl	Restore temporarily impacted habitat; no compensation required	Replacement of the habitat acreage, number of burrows, and number of burrowing owls impacted (1:1 compensation)
Secondary habitat as defined in the City of Marina's LCLUP (and not within ESHA as defined by the CCC)	Restore temporarily impacted habitat; no compensation required	1:1 compensation
Special-status plants	Restore temporarily impacted habitat; 1:1 compensation	2:1 compensation
Native stands of Monterey Pine	N/A	2:1 compensation
• Smith's blue butterfly • California tiger salamander and California red-legged frog • Sensitive natural communities, ESHA, primary habitat as defined in the City of Marina's LCLUP, or critical habitat • Jurisdictional waters	Restore temporarily impacted habitat; no compensation required	2:1 compensation
Western snowy plover	Restore temporarily impacted habitat; no compensation required	3:1 compensation

NOTE:

* This table provides a summary of the restoration and compensation requirements provided in the terrestrial resource mitigation measures. See the full text of the terrestrial resource mitigation measures for a detailed description of restoration and compensation requirements.

Mitigation Measure 4.6-1a applies to all project facilities: the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System–Hidden Hills Interconnection Improvements, and staging areas.

Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.

Prior to initiation of construction, CalAm and/or representatives of CalAm shall retain a qualified Lead Biologist[22] to oversee compliance with avoidance and minimization measures for all special-status species and sensitive habitats. The Lead Biologist shall be

[22] The term "qualified biologist" or "qualified Lead Biologist" for surveys is defined as an individual who shall possess, at a minimum, a bachelor's degree in biology, ecology, wildlife biology or closely related field and has demonstrated prior field experience using accepted resource agency techniques for the survey prescribed, and who possesses all appropriate USFWS, NMFS, and CDFW permits. The term "biological monitor" or "qualified biological monitor" is defined as holding similar educational credentials to those of a qualified biologist and who has functioned as an environmental inspector or monitor on at least two construction projects within the preceding two years.

onsite, or shall appoint qualified biologists and/or qualified biological monitors to be onsite, during all fencing and ground disturbance activities. The Lead Biologist, qualified biologists, and qualified biological monitors shall be subject to approval by resource agencies with jurisdiction over the special-status species with potential to occur at the project site (and local agencies, if required). Only the Lead Biologist and/or qualified biologists may lead protocol surveys and relocate special-status species, as authorized by the resource agencies with jurisdiction over these species.

In the event that construction-related activities have the potential to violate the prescribed special-status species and habitat protection measures, the project Lead Biologist, or other appointed qualified biological monitors shall report to construction or operational site supervisors with authority to stop work to prevent any violations. Work shall proceed only after the construction-related hazards to special-status species and habitats are removed. If a special-status wildlife species is present, work shall proceed only if the species is no longer at risk of injury or death. Violations shall be thoroughly documented as part of compliance monitoring activities.

The Lead Biologist shall ensure that all compliance monitoring activities are documented on a daily basis, and shall prepare a summary monitoring report on a monthly basis to be submitted to regulatory agencies upon their request. The monthly summary monitoring report shall provide information regarding the worker awareness training (see Mitigation Measure 4.6-1b below), surveys, and any observed special-status species, including any accidental injuries or fatalities. The monthly report shall also document the effectiveness and practicality of the prescribed avoidance and minimization measures and recommend modifications to the measures if needed. The Lead Biologist shall supply agency staff with copies of compliance records, including any reports of non-compliance, upon request.

The Lead Biologist shall have in her/his possession a copy of all compliance measures while work is being conducted onsite, and shall ensure that CalAm's onsite representatives and contractors also maintain copies of the compliance measures on the site. To facilitate the Lead Biologist's role, CalAm shall ensure that the Lead Biologist is fully apprised of all decisions that change or materially affect the schedule, methods, and location of work that is subject to the protective measures for biological resources.

This measure also applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1b applies to all project facilities.

Mitigation Measure 4.6-1b: Construction Worker Environmental Awareness Training and Education Program.

Prior to starting work, all construction workers at the project areas shall attend a Construction Worker Environmental Awareness Training and Education Program developed and presented by the Lead Biologist, appointed qualified biologist, and/or qualified biological monitor. The program shall include information on each federal and state-listed species, as well as other special-status wildlife and plant species and sensitive natural communities that may be encountered during construction activities. The training shall include: information on special-status species' life history and legal protections; the definition of "take" under the Federal Endangered Species Act (FESA) and California Endangered Species Act (CESA); the measures CalAm and/or its contractors have committed to implementing to protect special-status species and sensitive natural communities; reporting requirements and communication protocols; specific measures that each worker shall employ to avoid "take" of special-status species; and penalties for violation of FESA and/or CESA. Training shall be documented as follows:

1. An acknowledgement form shall be signed by each worker indicating that environmental training has been completed.
2. A sticker shall be placed on hard hats indicating that the workers have completed the environmental training. Construction workers shall not be permitted to operate equipment within the construction area unless they have attended the training and are wearing hard hats with the required sticker.
3. A copy of the training transcript/training video and/or DVD, as well as a list of the names of all personnel who attended the training and copies of the signed acknowledgement forms, shall be submitted to the CPUC.

This measure also applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1c applies to all project components.

Mitigation Measure 4.6-1c: General Avoidance and Minimization Measures.

CalAm's construction contractor(s) shall implement the following general avoidance and minimization measures to protect special-status species and sensitive natural communities at the facility sites during construction:

1. The construction footprint, staging areas, equipment access routes, and disposal or temporary placement of spoils, shall be delineated with stakes and flagging prior to construction to avoid natural resources outside of the project area. Any construction-related disturbance outside of these boundaries, including driving, parking, temporary access, sampling or testing, or storage of materials, shall be prohibited without explicit approval of the Lead Biologist.
2. New access driveways shall not extend beyond the delineated construction work area boundary. Construction vehicles shall pass and turn around only within the delineated construction work area boundary or local road network. Where new access is required outside of existing roads or the construction work area, the route shall be clearly marked (i.e., flagged and/or staked) prior to being used, subject to review and approval of the Lead Biologist.
3. Vehicle speeds within the project area shall not exceed 15 miles per hour on roads within the sites.
4. Excavated soils shall be stockpiled in disturbed areas lacking native vegetation. Stockpile areas shall be marked by the Lead Biologist to define the limits where stockpiling can occur.
5. Standard best management practices (such as setbacks and use of silt fences and fiber rolls) shall be employed to prevent loss of habitat due to erosion caused by project related impacts (i.e., grading or clearing for new roads). All detected erosion shall be remedied immediately upon discovery.
6. Fueling of construction equipment shall take place within existing paved areas, and at least 50 feet from drainages (including streams, creeks, ditches, culverts, or storm

drain inlets) and native habitats. Contractor equipment shall be checked for leaks prior to operation and repaired when leaks are detected. Fuel containers shall be stored within appropriately-sized secondary containment barriers.

7. The introduction of exotic plant species shall be avoided through physical or chemical removal and prevention. Measures to prevent the introduction of exotic plants into the construction site via vehicular sources shall include implementing Track clean or other method of vehicle cleaning for vehicles coming to the site and leaving the site. Earthmoving equipment shall be cleaned prior to transport to the project area. Weed-free rice straw or other certified weed-free straw shall be used for erosion control. Weed populations introduced into the site during construction shall be eliminated by chemical and/or mechanical means approved by California Department of Fish and Wildlife (CDFW) and the United States Fish and Wildlife Service (USFWS).

8. Use of herbicides as vegetation control measures shall be used only when mechanical means have been deemed ineffective. All uses of such herbicidal compounds shall observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and state and federal legislation as well as additional project-related restrictions deemed necessary by the CDFW and/or USFWS. No rodenticides shall be used.

9. Prior to the start of construction at any proposed facility site where special-status amphibians, reptiles and mammals have a moderate or high potential to occur, the construction work area boundary shall be fenced with a temporary exclusion fence to prevent special-status wildlife from entering the site during construction (see **Table 4.6-6** for the list of special-status species that could be significantly impacted at each project facility site). The exclusion fencing shall be constructed of metal flashing, plastic sheeting, or other materials that will prohibit California horned lizards, Monterey shrews, and other special-status reptiles, amphibians, and rodents from climbing the fence. If meshing is used it shall be of a size that would not catch wildlife. The fencing shall be buried a minimum of 6 inches below grade to secure the fence and extend a minimum of 30 inches above grade. The fencing shall be inspected by the Lead Biologist or qualified biological monitor on a daily basis during construction activities to ensure fence integrity. Any needed repairs to the fence shall be performed on the day of their discovery. Fencing shall be installed and maintained during all phases of construction. Final fence design and location shall be determined in consultation with USFWS and CDFW. Exclusion fencing shall be removed once construction activities are complete.

10. If special-status wildlife species are found on the site immediately prior to construction or during project construction, construction activities shall cease in the vicinity of the animal until the animal moves on its own (if possible, as determined by the Lead Biologist or biological monitor) outside of the project area. Additional mitigation measures specific to special-status plants; Smith's blue butterfly; black legless lizard, silvery legless lizard, and coast horned lizard; western burrowing; American badger; Monterey dusky-footed woodrat, California red-legged frog and California tiger salamander are described in Mitigation Measure 4.6-1f, 4.6-1g, 4.6-1h, 4.6-1j 4.6-1k, and 4.6-1o. The Lead Biologist and Lead Agencies shall consult with wildlife resource agency(ies) with jurisdiction over the species regarding any additional avoidance, minimization, or mitigation measures that may be necessary if the animal does not move on its own. A report shall be prepared by the Lead

Biologist to document the activities of the animal within the site; all fence construction, modification, and repair efforts; and movements of the animal once again outside the exclusion fence. This report shall be submitted to the CPUC and pertinent wildlife agencies with jurisdiction over the wildlife species.

11. Vegetation removal and grading activities shall be conducted during daylight hours. Immediately prior to conducting vegetation removal or grading activities inside fenced exclusion areas, the Lead Biologist or a qualified biologist shall survey within the exclusion area to ensure that no special-status species are present. The Lead Biologist or a qualified biologist shall also monitor vegetation removal or grading activities inside fenced exclusion areas for the presence of special-status species. If special-status species are present, then measure 10 above shall be implemented.

12. To prevent the inadvertent entrapment of special-status wildlife during construction, all excavated, steep-walled holes or trenches more than 2 feet deep shall be covered with plywood or similar materials at the close of each working day, or escape ramps constructed of earth fill or wooden planks shall be positioned within the excavations to allow special-status wildlife to escape on their own. Before such holes or trenches are filled, they shall be thoroughly inspected for trapped animals. If trapped animals are observed, escape ramps or structures shall be installed immediately to allow escape. If listed species are trapped, they shall only be relocated with authorization from USFWS and/or CDFW, as appropriate.

13. All construction pipes, culverts, or similar structures that are stored at a construction site for one or more overnight periods and with a diameter of 4 inches or more shall be inspected for special-status wildlife before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a special-status animal is discovered inside a pipe, that section of pipe shall not be moved until the appropriate resource agency, with jurisdiction over that species, has been consulted to determine the appropriate method for relocation. If necessary, under the direct supervision of the qualified biologist, the pipe may be moved once to remove it from the path of construction activity until the animal has escaped.

14. All vertical tubes used in project construction, such as chain link fencing poles or signage mounts, shall be temporarily or permanently capped at the time they are installed to avoid the entrapment and death of special-status birds.

15. Water used for dust abatement shall be minimized in an effort to avoid the formation of puddles that could attract common ravens and other predators to the construction work areas.

16. No vehicle or equipment parked in the project area shall be moved prior to inspecting the ground beneath the vehicle or equipment for the presence of wildlife. If present, the animal shall be left to move on its own.

17. All vehicles and equipment shall be in proper working condition to ensure that there is no potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The Lead Biologist shall be informed of any hazardous spills within 24 hours of the incident. Hazardous spills shall be immediately cleaned up and the contaminated soil shall be properly disposed of at a licensed facility.

18. A trash abatement program shall be implemented during construction. Trash and food items shall be contained in closed containers and removed from the construction site

daily to reduce the attractiveness to opportunistic predators such as common ravens, coyotes, and feral dogs.

19. Workers shall be prohibited from feeding wildlife and bringing pets and firearms to the construction work areas.

20. Intentional killing or collection of wildlife species, including special-status species in the project area and surrounding areas shall be strictly prohibited.

21. All temporarily disturbed areas shall be returned to pre-project conditions or better. Existing access roads within the CEMEX site shall be returned to their existing use.

22. Only natural-fiber, biodegradable meshes and coir rolls shall be used for erosion control and landscaping. Photodegradable and other plastic mesh erosion control products shall not be used.

23. Invasive plant species shall not be installed at any restoration or mitigation site.

This measure also applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1d applies to the subsurface slant wells and the Source Water Pipeline and Source Water Pipeline Optional Alignment.

Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover.

Construction contractors shall be required to implement the following measures to protect western snowy plover:

1. CalAm shall require that its construction contractor(s) implement all avoidance and minimization measures required by USFWS as part of the FESA Section 7 consultation between the ONMS and USFWS.

2. Construction work at the slant well heads and along the segment of the Source Water Pipeline located west of the CEMEX processing plant shall occur during the western snowy plover non-breeding season (defined as October 1 through February 28) unless otherwise approved by the USFWS.

3. For work that cannot be completed during the non-nesting season, the following steps to obtaining USFWS approval shall be implemented:

   a. CalAm shall include in final design submittals to the Lead Agencies and USFWS proposed feasible methods of avoidance and minimization of impacts on nesting western snowy plovers. Such measures may include, but are not limited to, installation of visual or noise barriers, limiting the type of construction, installation of noise controls on equipment, and other measures that achieve visual separation and/or noise reduction. CalAm shall obtain concurrence from Lead Agencies and USFWS on this proposed suite of avoidance and minimization measures prior to start of construction of the subsurface slant wells and Source Water Pipeline. Measures shall be implemented as necessary as described in item d, below.

   b. CalAm shall engage the services of Point Blue or other qualified western snowy plover biologist (subject to approval by USFWS) to perform one year of surveys during the nesting season preceding construction to determine whether nesting is occurring within sight or audible range of the slant well head locations or Source Water Pipeline.

c. If findings from the nesting season survey are negative, then the qualified western snowy plover biologist shall conduct additional pre-construction nesting surveys within 24 hours of initiation of construction activities within 300 feet of all construction work areas to determine if any snowy plover nests are present. If there is a break of 3 days or more in construction activities, a survey shall be conducted before construction begins again.

d. If nests are observed within 300 feet of construction activities, the qualified biologist shall notify and consult with USFWS to determine whether construction may proceed, based on detailed information on location of nest(s), proximity to construction, topography, and noise environment. Additional avoidance or minimization measures shall be implemented prior to initiating construction activities. Construction may proceed if, with the incorporation of such avoidance or minimization measures, the work would not cause an adult to abandon an active nest or young, change an adult's behavior so it could not care for an active nest or young, or directly impact an adult or young, or as allowed within the take provisions authorized by USFWS.

e. The biologist shall conduct periodic monitoring during construction to determine if there are any nest starts. Nest starts shall be reported to USFWS to determine whether construction on all or portions of the slant wells or Source Water Pipeline need to be suspended for the duration of nesting and fledging. The biologist will inform the decision with detailed information on location of nest(s), proximity to construction, topography, and noise environment. Construction may continue, subject to USFWS approval, if, with the incorporation of avoidance or minimization measures identified under item a, above, and deemed necessary by USFWS, the work would not cause an adult to abandon an active nest or young, change an adult's behavior so it could not care for an active nest or young, or directly impact an adult or young, or as allowed within the take provisions authorized by USFWS.

4. For construction during the breeding season that is approved by USFWS, visual barriers shall be installed around any work area located within line of sight of potential nesting habitat. Visual barriers shall be constructed at an adequate height and width to visually block construction equipment and construction crews from snowy plover nesting habitat. Final designs of the visual barriers shall be coordinated with USFWS. Existing sand dunes may serve as visual barriers.

5. For work conducted during the non-nesting season, a qualified biologist will evaluate the nature and extent of wintering plover activity in the project area no more than 3 days prior to construction and inform CalAm so they can implement avoidance and minimization measures, such as those listed in subsection 3a, that avoid or minimize disturbance to plovers. The biologist shall conduct periodic monitoring during construction to ensure that minimization measures are implemented to avoid or minimize disturbance to plovers. The measures shall ensure that wintering plovers are not directly impacted by construction activities.

6. CalAm shall restore all temporarily impacted potential snowy plover habitat following construction. At a minimum the restored site shall meet the following performance standards by the fifth year following restoration:

a. Temporarily impacted areas are returned to pre-project conditions or greater

b. Native vegetation cover shall be at least 70 percent of baseline native vegetation cover

c. The restoration area shall have no more cover by invasives than the baseline

Restoration and performance standards shall be described in a Habitat Mitigation and Monitoring Plan consistent with **Mitigation Measure 4.6-1n (Habitat Mitigation and Monitoring Plan)**.

7. Anti-perching devices, such as bird spikes or wire strips, shall be installed and maintained on the top of the proposed electrical control cabinets to discourage potential plover predators.

8. Permanent loss of western snowy plover habitat, to be determined based on final design and construction specifications, will be compensated at a minimum ratio of 3:1. Compensation may be in the form of permanent on-site or off-site creation, restoration, enhancement, or preservation of habitat for western snowy plover.

   Prior to project implementation, CalAm shall prepare a Habitat Mitigation and Monitoring Plan, as described in Mitigation Measure 4.6-1n (Habitat Mitigation and Monitoring Plan), which will describe either onsite or offsite creation, restoration, enhancement, or preservation. The plan will include actions to benefit western snowy plover, in conjunction with providing mitigation for special-status plants, as described in Mitigation Measure 4.6-1e, below. The plan will be subject to USFWS input and approval. It will describe creation, restoration, and/or enhancement methods that may include, but not be limited to removal of ice plant, stabilization of dune sand, planting, seeding or other means of re-establishing native plant species. It will describe measures to manage recreational activities to benefit western snowy plover. Measures may include requiring that dogs are on leash, fencing is installed around breeding areas, and kite flying is restricted in the breeding season.

   CalAm will identify and secure access rights and other approvals to implement the plan, and will execute the plan. CalAm will conduct, or will support a qualified third party monitor to conduct annual monitoring of performance measures for a minimum of five years, such as cover, density and diversity of native plant species, thresholds of non-native plant abundance, and stability of dune sands. At a minimum, the compensation areas shall meet the following performance standards by the fifth monitoring year:

a. Native vegetation cover shall be at least 70 percent of the native vegetation cover in the impact area.

b. The compensation areas shall not be heavily vegetated.

c. Invasive species cover shall be less than or equal to the invasive species cover in the impact area

d. No barrier between the compensation site and the water

e. No significant erosion

This measure also applies to periodic maintenance of the subsurface slant wells, which would result in a permanent loss of western snowy plover habitat. Compensatory mitigation for permanent loss from periodic maintenance of the subsurface slant wells would only be applied once and would not be applied for each five-year maintenance event.

Mitigation Measure 4.6-1e applies to: the: the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Ryan Ranch-Bishop Interconnection Improvements, Main System–Hidden Hills Interconnection Improvements, and staging areas.

Mitigation Measure 4.6-1e: Avoidance and Minimization Measures for Special-status Plants.

Prior to construction, CalAm or its contractor shall conduct focused botanical survey(s) for special-status plants in all potentially suitable habitat during the appropriate blooming period for each species and in accordance with the guidelines established by California Department of Fish and Game in *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG, 2009). Maps depicting the results of these surveys shall be prepared for use in final design. If more than two years elapse between the focused botanical surveys and commencement of ground disturbance activities, a final set of appropriately-timed focused botanical surveys shall be conducted and populations mapped. The results of these final surveys shall be combined with previous survey results to produce habitat maps showing habitat where the special-status plants have been observed during either of the focused botanical surveys conducted for each facility site.

Special-status plant species are widespread throughout the project area, and could occur at the following facility locations: subsurface slant well site, MPWSP Desalination Plant site, ASR-5 and ASR-6 Wells sites, and along the Source Water Pipeline, new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional Alignment, the Castroville Pipeline and Castroville Pipeline Optional Alignments, new Transmission Main and new Transmission Main Optional Alignment, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements, and at proposed staging areas.

1. To the extent feasible, project facilities shall be sited to avoid permanent and temporary impacts on special-status plants and their required constituent habitat elements.

2. Special-status plants located within temporary construction areas shall be fenced or flagged for avoidance (if feasible) prior to construction. The Lead Biologist or the appointed biological monitor shall ensure compliance with off-limits areas. If avoidance is not feasible, seasonal avoidance measures (i.e., limited operating periods based on timing of annual plant dormancy), or temporarily placing heavy fabric or wooden mats over the affected habitat shall be applied as appropriate. Topsoil salvage and site restoration may also be implemented, to be determined by the Lead Biologist and USFWS and CDFW, as appropriate, to ensure the site is returned to pre-construction conditions.

3. For potential impacts on listed plant species, such as Menzies' wallflower, sand gilia, Monterey spineflower, and Yadon's rein orchid, CalAm shall comply with the FESA CESA by implementing any requirements from USFWS and CDFW consultation. For state listed rare plants, a state Incidental Take Permit (ITP) may be required which would provide conditions for allowable take and measures to compensate impacts on rare plants.

4. For HMP plant species on former Fort Ord lands, plants shall be salvaged, under the direction of a qualified biologist, as necessary, per the requirements of the HMP, and in accordance with any requirements from USFWS and CDFW.

5. If avoidance is not feasible, compensation for temporary or permanent loss of special-status plant occurrences, in the form of land purchase or restoration, shall be provided at a minimum 1:1 ratio for temporary impacts and 2:1 ratio for permanent impacts. Compensation for loss of special-status plant populations may include the restoration or enhancement of temporarily impacted areas, purchase and permanent stewardship of known occupied habitat or the restoration and reintroduction of populations in degraded, unoccupied habitat. Restoration or reintroduction may be located on- or offsite. At a minimum, the compensation areas shall meet the following performance standards by the fifth year following initiation of compensation efforts:

   a. The compensation area shall be at least the same size as the impact area.

   b. Native vegetation cover shall be at least 70 percent of the native vegetation cover in the impact area

   c. Population of the impacted special-status species shall have either:

      i. at least 60 percent cover of the impact area, or

      ii. at least 70 percent survival of installed plants

   d. Invasive species cover shall be less than or equal to the invasive species cover in the impact area

   Additionally, restored populations shall have greater than the number of individuals of the impacted population, in an area greater than or equal to the size of the impacted population, for at least 3 consecutive years without irrigation, weeding, or other manipulation of the restoration site.

6. CalAm shall prepare a **Habitat Mitigation and Monitoring Plan, as described in Mitigation Measure 4.6-1n** (Habitat Mitigation and Monitoring Plan), which will describe either onsite or offsite restoration.

   Alternatively, compensatory credits may be purchased through a USFWS- and/or CDFW-approved mitigation bank, or USFWS-approved Habitat Conservation Plan.

This measure also applies to periodic maintenance of the subsurface slant wells, which would result in a permanent loss of special-status plants occurring at that site. Compensatory mitigation for permanent loss from periodic maintenance of the subsurface slant wells would only be applied once and would not be applied for each five-year maintenance event.

Mitigation Measure 4.6-1f applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, New Transmission Main and New Transmission Main Optional Alignment, and staging areas.

Mitigation Measure 4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly.

CalAm or its construction contractor(s) shall implement the following measures to reduce impacts on Smith's blue butterfly during construction:

1. CalAm shall require that its construction contractor(s) implement all avoidance and minimization measures required by USFWS as part of the FESA Section 7 consultation between ONMS and USFWS.
2. Floristic botanical surveys of all suitable habitat for coast buckwheat and seacliff buckwheat, both of which are host plants to Smith's blue butterfly, shall be conducted by a qualified biologist during project design and prior to project implementation. Maps depicting the results of these surveys shall be prepared to document the location of the host plants within or adjacent to the project area.
3. Construction of project elements shall be planned to avoid mapped host plants for Smith's blue butterfly whenever feasible.
4. If it is not feasible to avoid disturbance to host plants during project construction, the following shall be implemented:
   a. Prior to the start of construction activities and before conducting preconstruction surveys for Smith's blue butterfly, the Lead Biologist or an appointed qualified biologist shall prepare a protect-in-place and relocation plan for Smith's blue butterfly and its host plants. If either is found in areas subject to permanent habitat or plant loss, then plants would be salvaged and relocated in accordance with the plan. The relocation plan shall be submitted to USFWS for approval. The relocation plan shall define the study area, describe appropriate handling and relocation methods (such as digging up and removing individual plants, duff, and/or soil and moving them to a new location), and identify appropriate relocation sites. Surveys shall be conducted at relocation sites to determine the existing Smith's blue butterfly population size and ensure that the relocation sites will not become overpopulated. Only relocation sites that are not overpopulated and have suitable habitat conditions (e.g. soils, vegetation, etc.) shall be used.
   b. If preconstruction surveys identify butterflies or host plants in areas subject only to temporary disturbance that do not require plant removal, then the plants, and leaf litter and soil which may hold dormant butterfly pupae, would be protected in place with heavy fabric, plywood or other mats (depending on the stability of the underlying soil) to allow construction vehicles to pass over. Following construction, the fabric or mats would be carefully removed and the area allowed to recover. Short-term damage to buckwheat populations is expected to be low.
   c. A qualified biologist shall survey the work area no more than 30 days before the onset of ground disturbance. If any life stage of the Smith's blue butterfly or its host plants is found within the project area boundary, the Lead Biologist

or qualified biologist shall relocate plants, duff, and/or soil, from the site before construction begins per the relocation plan described above.

5. Upon completion of construction activities, CalAm shall restore Smith's blue butterfly habitat temporarily impacted during construction. Compensatory mitigation for permanent impacts shall be provided either onsite or offsite at a minimum ratio of 2:1. Compensation for loss of host plant populations may be in the form of permanent on-site or off-site creation, restoration, enhancement, or preservation of habitat. At a minimum the restoration or compensation sites shall meet the following performance standards by the fifth year following restoration:

   a. Temporarily impacted areas are returned to pre-project conditions or greater

   b. Native vegetation cover shall be at least 70 percent of baseline/impact area native vegetation cover

   c. The population of coast buckwheat and/or seacliff buckwheat shall have either:

      i. at least 60 percent cover of the baseline/impact area, or

      ii. at least 70 percent survival of installed plants

   d. No more cover by invasives than the baseline/impact area

   Restoration and mitigation activities shall be described in the Habitat Mitigation and Monitoring Plan prescribed by **Mitigation Measure 4.6-1n (Habitat Mitigation and Monitoring Plan)**.

   Alternatively, compensatory credits may be purchased through an approved mitigation bank, or approved Habitat Conservation Plan.

This measure also applies to periodic maintenance of the subsurface slant wells, which would result in a permanent loss of Smith's blue butterfly habitat. Compensatory mitigation for permanent loss from periodic maintenance of the subsurface slant wells would only be applied once and would not be applied for each five-year maintenance event.

Mitigation Measure 4.6-1g applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, and staging areas.

Mitigation Measure 4.6-1g: Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard.

The Lead Biologist shall appoint a qualified biologist possessing a Scientific Collecting Permit issued by CDFW for black legless lizard, silvery legless lizard, and coast horned lizard to conduct preconstruction surveys for legless lizards and coast horned lizards within 24 hours prior to the initiation of ground disturbing activities or vegetation clearing in suitable habitats such as central dune scrub, coast sage scrub, and central maritime chaparral.

1. Prior to conducting the surveys, the qualified biologist shall prepare a relocation plan that describes the appropriate survey and handling methods for the lizards, and identifies nearby relocation sites where the lizards would be relocated if found during the preconstruction surveys. Surveys shall be conducted at relocation sites to determine the existing lizard population size and ensure that the relocation sites will not become overpopulated. Only relocation sites that are not overpopulated and have suitable habitat conditions (e.g., soils, moisture content, vegetation, aspect) shall be used. The relocation plan shall be submitted to CDFW for approval prior to the start of construction activities.

2. Legless lizard surveys shall be conducted by hand raking soil and leaf litter beneath brush. If Legless lizards are encountered, they shall be salvaged and relocated per the relocation plan.

3. Coast horned lizard surveys shall be conducted by walking transects spaced appropriately to allow for 100 percent visual coverage in search of lizards under shrubs, along gravelly-sandy areas, or any other suitable habitat. Any lizard encountered shall be relocated per the relocation plan.

This measure also applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1h applies to the Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, New Transmission Main and New Transmission Main Optional Alignment, and staging areas.

Mitigation Measure 4.6-1h: Avoidance and Minimization Measures for Western Burrowing Owl.

The following measures shall be implemented to avoid and minimize impact on western burrowing owl:

1. Prior to the start of construction activities in or around suitable burrowing owl habitat, the Lead Biologist shall appoint a qualified biologist to conduct protocol surveys for burrowing owl. The survey methodology shall be consistent with the methods outlined in the *Staff Report on Burrowing Owl Mitigation* (CDFG, 2012). The surveys shall consist of walking parallel transects spaced 7 to 20 meters (23 to 65 feet) apart, adjusting for vegetation height and density as needed, and noting any potential burrows with fresh burrowing owl sign or presence of burrowing owls. A copy of the protocol survey results shall be submitted to the CPUC and CDFW upon request. Protocol surveys shall be conducted within both the breeding and non-breeding seasons to determine the presence/absence of burrowing owls.

2. A qualified biologist shall conduct preconstruction surveys of the permanent and temporary impact areas in or around suitable burrowing owl habitat to locate active breeding or wintering burrowing owl burrows not more than less than 14 days prior to construction and/or prior to exclusion fencing installation. The methodology for the preconstruction surveys shall be consistent with the methods outlined in the *Staff Report on Burrowing Owl Mitigation*.

3. If no burrowing owls are detected, no additional action is necessary.

4. In areas positive for burrowing owl presence, the Lead Biologist or qualified biological monitor shall be onsite during all construction activities in areas where burrowing owls are determined to be present.

5. If burrowing owls are detected during the nesting and fledging seasons (April 1 to August 15 and August 16 to October 15, respectively), no ground-disturbing activities shall be permitted within the distances specified in **Table 4.6-8** from an active burrow, unless otherwise authorized by CDFW. The specified buffer distance ranges from 656 feet to 1,640 feet, according to the time of year and the level of disturbance. Buffers shall be established in accordance with **Table 4.6-8** and occupied burrows shall not be disturbed during the nesting season unless a qualified biologist approved by CDFW verifies through noninvasive methods that either: (1) the birds have not begun egg-laying and incubation; or (2) juveniles from the occupied burrows are foraging independently and are capable of independent survival. Burrowing owls shall not be moved or excluded from burrows during the breeding season (April 1 to October 15). The buffer distance can be reduced with authorization from CDFW if construction activities would not cause an adult to abandon an active nest or young or change an adult's behavior so it could not care for an active nest or young.

6. During the non-breeding (winter) season (October 16 to March 31), consistent with **Table 4.6-8**, ground-disturbing work shall maintain a distance ranging from 164 to 1,640 feet from any active burrows, depending on the level of disturbance, to be determined through coordination with CDFW. The buffer distance can be reduced with authorization from CDFW if construction activities would not cause the owl to abandon its winter burrow. If active winter burrows are found that would be directly affected by ground-disturbing activities, owls can be displaced from winter burrows according to recommendations made in the *Staff Report on Burrowing Owl Mitigation*.

TABLE 4.6-8
BURROWING OWL BURROW BUFFERS

Location	Time of Year	Level of Disturbance		
		Low	Medium	High
Nesting sites	April 1–August 15	656 feet	1,640 feet	1,640 feet
Nesting sites	August 16–October 15	656 feet	656 feet	1,640 feet
Any occupied burrow	October 16–March 31	164 feet	328 feet	1,640 feet

SOURCE: CDFG, 2012.

7. Burrowing owls shall not be excluded from burrows unless or until a Burrowing Owl Exclusion Plan is developed by the Lead Biologist, approved by CDFW, and submitted to the CPUC. At a minimum, the plan shall include the following:

   a. Confirmation by site surveillance that the burrow(s) is empty of burrowing owls and other species preceding the use of a scope to visually inspect the burrow;

   b. Specifications regarding the type of scope to be used and the appropriate timing of using a scope to visually inspect burrows to avoid disturbance of individual owls;

c. Occupancy factors to look for and what shall guide determination of vacancy and excavation timing;

d. Methods for burrow excavation. Excavation using hand tools with refilling to prevent reoccupation is preferable;

e. Removal of other potential owl burrow surrogates or refugia onsite;

f. Photographing the excavation and closure of the burrow to demonstrate success and sufficiency;

g. Monitoring of the site to evaluate success and, if needed, to implement remedial measures to prevent subsequent owl use and to avoid take;

h. Methods to ensure the impacted site shall continually be made inhospitable to burrowing owls and fossorial[23] mammals (e.g., by allowing vegetation to grow tall, heavy disking, or immediate and continuous grading) until development is complete.

8. Site monitoring shall be conducted prior to, during, and after exclusion of burrowing owls from their burrows sufficient to ensure take is avoided. Prior to exclusion activities, daily monitoring shall be conducted for one week to confirm young owls have fledged if the exclusion occurs immediately after the end of the breeding season.

9. If burrowing owls are found on-site, compensatory mitigation for loss of breeding and/or wintering habitat shall be implemented onsite or offsite in accordance with burrowing owl *Staff Report on Burrowing Owl Mitigation* guidance and in consultation with CDFW. If compensatory mitigation is necessary, CalAm shall detail the compensatory mitigation in a Burrowing Owl Habitat Mitigation Plan (which shall be incorporated into the Habitat Mitigation and Monitoring Plan described in **Mitigation Measure 4.6-1n**). At a minimum, the following measures shall be implemented:

a. Temporarily disturbed habitat shall be restored to pre-construction conditions, including soil decompaction and revegetation.

b. Permanent impacts on nesting, occupied and satellite burrows, and any other burrowing owl habitat shall be mitigated such that the habitat acreage, number of burrows, and number of burrowing owls impacted are replaced. Compensatory mitigation may include the permanent conservation of lands with similar vegetation communities (grassland, scrublands, desert, urban, and agriculture) as those lands where the permanent loss of habitat would occur. Conservation lands shall provide habitat for burrowing owl nesting, foraging, wintering, and/or dispersal (i.e., during breeding and nonbreeding seasons) comparable to or better than that of the impact area, and with sufficiently large acreage, and presence of fossorial mammals.

   Alternatively, compensatory credits may be purchased through an approved mitigation bank, or approved Habitat Conservation Plan.

[23] Adapted to digging or burrowing.

Mitigation Measure 4.6-1i applies to all project components.

Mitigation Measure 4.6-1i: Avoidance and Minimization Measures for Nesting Birds.

This measure applies to all nesting birds protected by the federal Migratory Bird Treaty Act and Section 3503 of the California Fish and Game Code, except for western snowy plover and western burrowing, which are addressed in Mitigation Measure 4.6-1d and 4.6-1h, respectively.

Nesting birds may be present at all of the proposed facility sites. A qualified biologist shall conduct preconstruction avian nesting surveys prior to initiation of construction activities at all facility sites, unless otherwise indicated below.

1. No preconstruction surveys or avoidance measures are required for construction activities that would be completed entirely during the non-nesting season (September 16 to January 31).
2. For all construction activities scheduled to occur during the nesting season (February 1 to September 15), the qualified biologist shall conduct a preconstruction avian nesting survey no more than 10 days prior to the start of staging, site clearing, and/or ground disturbance. Copies of the survey results shall be submitted to the CPUC.
3. If construction activities at any given facility site begins in the non-breeding season and proceeds continuously into the breeding season, no surveys are required as long as a similar type of construction continues.
4. If there is a break of 10 days or more in construction activities during the breeding season, a new nesting bird survey shall be conducted before reinitiating construction.
5. The surveying biologist shall be capable of determining the species and nesting stage without causing intrusive disturbance. The surveys shall cover all potential nesting sites within 500 feet of the project area for raptors and within 300 feet for other birds.

If active nests are found in the project area or vicinity (500 feet for raptors and 300 feet for other birds), the nests shall be continuously surveyed for the first 24 hours prior to any construction related activities to establish a behavioral baseline and, once work commences, all nests shall be continuously monitored to detect any behavioral changes as a result of the project, if feasible. If behavioral changes are observed, work causing the change shall cease and CDFW shall be consulted for additional avoidance and minimization measures. The avoidance and minimization measures shall ensure that the construction activities do not cause the adult to abandon an active nest or young or change an adult's behavior so it could not care for an active nest or young.

If continuous monitoring is not feasible, a no-disturbance buffer (at least 500 feet for raptors and 250 feet for other birds [or as otherwise determined in consultation with CDFW and USFWS] shall be created around the active nests). The buffer distance can be reduced with authorization from CDFW if construction activities would not cause an adult to abandon an active nest or young or change an adult's behavior so it could not care for an active nest or young. If the nest(s) are found in an area where ground disturbance is scheduled to occur, the project operator shall require that ground disturbance be delayed until after the birds have fledged.

This measure also applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1j applies to the MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas.

Mitigation Measure 4.6-1j: Avoidance and Minimization Measures for American Badger.

The following measures shall be implemented to avoid and minimize impacts on American badger:

1. A qualified biologist shall conduct preconstruction surveys for American badger dens prior to the start of construction at potentially affected sites. The survey results shall be submitted to the CPUC.
2. Areas of suitable habitat for American badger in the project area include fallow agricultural and grazing land and non-native grasslands. Surveys shall be conducted wherever these vegetation communities exist within 100 feet of the project area boundary. Along pipeline alignments surveys shall be phased to occur within 14 days prior to disturbance along that portion of the alignment.
3. If no potential American badger dens are found during the preconstruction surveys, no further action is required.
4. If the biologist determines that any potential dens identified during the preconstruction surveys are inactive, the biologist shall excavate the dens by hand with a shovel to prevent use by badgers during construction.
5. If active badger dens are found during the course of preconstruction surveys, the following measures shall be taken to avoid and minimize adverse effects on American badger:
    a. Relocation shall be prohibited during the badger pupping season (typically February 15 to June 1).
    b. Construction activities shall not occur within 50 feet of active badger dens observed outside of the project area.
    c. The Lead Biologist shall contact CDFW immediately if natal badger dens are detected. Construction activities shall not occur within 200 feet of an active natal badger den. This buffer may be reduced, if approved by CDFW, and if construction would not alter the behavior of the adult or young in a way that would cause injury or death to those individuals.

If the biologist determines that potential dens within the project area, and outside the breeding season, may be active, the biologist shall notify the CDFW. Badgers shall be passively relocated from active dens during the nonbreeding season. Passive relocation may include incrementally blocking the den entrance with soil, sticks, and debris for three to five days to discourage use of these dens prior to project disturbance. After the qualified biologist determines that badgers have abandoned any active dens found within the project area, the dens shall be hand-excavated with a shovel to prevent re-use during construction.

Mitigation Measure 4.6-1k applies to the Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas.

Mitigation Measure 4.6-1k: Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat.

The following measures shall be implemented to avoid and minimize impacts on Monterey dusky-footed woodrat:

1. A qualified wildlife biologist shall conduct preconstruction surveys for Monterey dusky-footed woodrat. The surveys shall be conducted within 14 days prior to the start of construction in suitable habitat and shall identify any woodrat nests located within 50 feet of anticipated construction disturbance areas.
2. If woodrat nests are found during the preconstruction surveys, the wildlife biologist shall conduct additional surveys throughout the duration of construction activities at the potentially affected facility site to identify any newly constructed woodrat nests.
3. If nests are observed outside of the construction area, the qualified biologist shall demarcate a minimum 50-foot buffer area with orange construction fencing and require that all construction activities and disturbance remain outside of the fencing.
4. Active woodrat nests located within the anticipated construction disturbance areas shall be relocated. Nests shall be relocated outside of the peak breeding season, (peak breeding season is typically February through November) to minimize disturbance to young woodrats. Relocation of woodrats and/or their nests shall be conducted by the Lead Biologist or qualified wildlife biologist as follows:
    a. Clear understory vegetation from around the nest using hand tools.
    b. After all vegetative cover has been cleared around the nest, the biologist shall gently disturb the nest to encourage the woodrat(s) to abandon the nest and seek cover in adjacent habitat.
    c. Once the woodrats have left the nest, the biologist shall carefully relocate the nest sticks to suitable habitat outside of the construction disturbance area, piling the sticks at the base of trees or large shrubs if available. If multiple nests are relocated, the stick piles shall be placed at least 25 feet from one another.
    d. The Lead Biologist shall ensure potential health hazards to the biologists moving nests are addressed to minimize the risk of contracting diseases associated with woodrats and woodrat nests. These include hantavirus, Lyme disease, and plague. The biologists that relocate nests shall take the following precautionary safety measures:
        i. Wear a Cal/OSHA-certified facial respirator to reduce inhalation of potential disease causing organisms.
        ii. Wear a white Tyvec protective suit to provide a barrier for ticks and fleas and facilitate their detection and removal and use gloves.

e. If young are encountered during dismantling of the nest, nest material shall be replaced and a 50-foot no-disturbance buffer shall be established around the active nest. The buffer shall remain in place until young have matured enough to disperse on their own accord and the nest is no longer active. Nesting substrate shall then be collected and relocated to suitable oak woodland habitat outside of the project area.

Mitigation Measure 4.6-1l applies to the MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System–Hidden Hills Interconnection Improvements, and staging areas.

Mitigation Measure 4.6-1l: Avoidance and Minimization Measures for Special-status Bats.

A qualified biologist who is experienced with bat surveying techniques (including auditory sampling methods), behavior, roosting habitat, and identification of local bat species shall be consulted prior to initiation of construction activities to conduct a preconstruction habitat assessment to characterize potential bat habitat and identify active roost sites. The preconstruction habitat assessment shall be conducted within 100 feet of construction activities.

Should potential roosting habitat or potentially active bat roosts be identified during the habitat assessment in trees and/or structures to be disturbed under the project, the following measures shall be implemented:

1. Removal or disturbance of trees or structures identified as potential bat roosting habitat or active roosts shall occur when bats are active, approximately between the periods of March 1 to April 15 and August 15 to October 15, to the extent feasible. These dates avoid bat maternity roosting season (approximately April 15 – August 31) and periods of winter torpor (approximately October 15 – February 28).

2. If removal or disturbance of trees and structures identified as potential bat roosting habitat or active roosts during the periods when bats are active is not feasible, a qualified biologist will conduct pre-construction surveys within 14 days prior to disturbance to further evaluate bat activity within the potential habitat or roost site.

    a. If active bat roosts are not identified in potential habitat during preconstruction surveys, no further action is required prior to removal of- or disturbance to trees and structures within the preconstruction survey area.

    b. If active bat roosts or evidence of roosting is identified during pre-construction surveys, the qualified biologist shall determine, if possible, the type of roost and species.

        i. If special-status bat species or maternity or hibernation roosts are detected during these surveys, appropriate species- and roost-specific avoidance and protection measures shall be developed by the qualified biologist in coordination with CDFW. Such measures may include postponing the removal of structures or trees, or establishing exclusionary work buffers while the roost is active. A minimum 100-foot no disturbance buffer shall be established around special-status species, maternity, or hibernation roosts until the qualified biologist determines they are no longer active. The size of the no-disturbance buffer may be adjusted by the qualified biologist, in coordination with CDFW, depending on the species present, roost type, existing screening around the roost site (such as dense vegetation or a building), as well as the type of construction activity that would occur around the roost site, and if construction would not alter the behavior of the adult or young in a way that would cause injury or death to those individuals.

Under no circumstances shall active maternity roosts be disturbed until the roost disbands at the completion of the maternity roosting season or otherwise becomes inactive, as determined by the qualified biologist.

ii. If a non-maternity or hibernation roost (e.g., bachelor daytime roost) is identified, disturbance to- or removal of trees or structures may occur under the supervision of a qualified biologist as described under 3).

3. The qualified biologist shall be present during tree and structure disturbance or removal if active non-maternity or hibernation bat roosts or potential roosting habitat are present. Trees and structures with active non-maternity or hibernation roosts or potential habitat shall be disturbed or removed only under clear weather conditions when precipitation is not forecast for three days and when nighttime temperatures are at least 50°F, and when wind speeds are less than 15 mph.

   a. Trimming or removal of trees with active (non-maternity or hibernation) or potentially active roost sites shall follow a two-step removal process:

      i. On the first day of tree removal and under supervision of the qualified biologist, branches and limbs not containing cavities or fissures in which bats could roost, shall be cut only using hand tools (e.g., chainsaws).

      ii. On the following day and under the supervision of the qualified biologist, the remainder of the tree may be removed, either using hand tools or other equipment (e.g. excavator or backhoe).

      iii. All felled trees shall remain on the ground for at least 24 hours prior to chipping, off-site removal, or other processing to allow any bats to escape, or be inspected once felled by the qualified biologist to ensure no bats remain within the tree and/or branches.

   b. Disturbance to or removal of structures containing or suspected to contain active bat (non-maternity or hibernation) or potentially active bat roosts shall be done in the evening and after bats have emerged from the roost to forage. Structures shall be partially dismantled to significantly change the roost conditions, causing bats to abandon and not return to the roost. Removal will be completed the subsequent day.

4. Bat roosts that begin during construction are presumed to be unaffected as long as a similar type of construction continues, and no buffer would be necessary. Direct impacts on bat roosts or take of individual bats will be avoided.

Mitigation Measure 4.6-1m applies to the Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

Mitigation Measure 4.6-1m: Avoidance and Minimization Measures for Native Stands of Monterey Pine.

A qualified botanist or arborist shall conduct surveys for native stands of Monterey pine prior to completion of final project design documents. Individual Monterey pine trees existing within the construction work area shall be evaluated to determine if they are native occurrences, relics, or otherwise naturally-occurring remnants of the past historic range. Maps depicting the results of these surveys shall be prepared for consideration during final facility design. Native stands of Monterey pine could occur at the identified facility sites and pipeline alignments based on the historical extent of native Monterey pines and biological reconnaissance surveys.

To the extent feasible, project facilities shall be sited and construction activities planned to avoid impacts on native stands of Monterey pine. Any native stands of Monterey pines located within the anticipated construction disturbance area shall be fenced or flagged for avoidance prior to construction, and a biological monitor shall be present to ensure compliance with off-limits areas.

If removal of native stands of Monterey pine cannot be avoided, trees shall be replaced at a 2:1 ratio for trees removed or directly impacted by construction activities. Only local Monterey pine genetic stock shall be used for replanting at the project site. Replacement plantings shall be planted contiguous with other individuals of the same species in areas that are determined to have suitable site conditions. Protective fencing shall be installed around the seedlings to protect against disturbance. Replacement trees shall be maintained and monitored for a period of five years and have a minimum of 70 percent survival in the fifth monitoring year to ensure success. The Habitat Mitigation and Monitoring Plan to be prepared in accordance with **Mitigation Measure 4.6-1n (Habitat Mitigation and Monitoring Plan)** shall detail the monitoring requirements and success criteria.

This mitigation measures applies to native stands of Monterey pines. Independent of whether Monterey pines in the project area are considered native stands, individual trees may be subject to local tree ordinances; see **Mitigation Measure 4.6-5 (Compliance with Local Tree Policies and Ordinances)**.

Mitigation Measure 4.6-1n applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas.

Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan.

CalAm shall develop and submit a Habitat Mitigation and Monitoring Plan (HMMP) to the appropriate resource agencies (CCC, CDFW, CCRWQCB, USACE, USFWS, and local agencies that require a habitat mitigation and monitoring plan) for approval prior to project construction. The HMMP will be a comprehensive document that will describe all of restoration and compensatory mitigation requirements, including the required performance standards, identified in **Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover, Mitigation Measure 4.6-1e: Avoidance and Minimization Measures for Special-status Plants, Mitigation Measure 4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly, Mitigation Measure 4.6-1h: Avoidance and Minimization Measures for Western Burrowing Owl, Mitigation Measure 4.6-1m: Avoidance and Minimization Measures for Native Stands of Monterey Pine, Mitigation Measure 4.6-1o: Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander and Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas**. The HMMP shall be implemented at all areas where special-status species habitat or sensitive natural communities will be restored, created, or enhanced to mitigate for project impacts either prior to, concurrently with, or following project construction, as specified in the HMMP. The HMMP shall outline measures to be implemented to, depending on the mitigation requirements, restore, improve, or re-establish special-status species habitat, sensitive natural communities, and critical habitat on the site, and shall include the following elements:

1. Name and contact information for the property owner of the land on which the mitigation will take place
2. Identification of the water source for supplemental irrigation
3. Identification of depth to groundwater
4. Site preparation guidelines to prepare for planting, including coarse and fine grading
5. Plant material procurement, including assessment of risk of introduction of plant pathogens through use of nursery-grown container stock vs. collection and propagation of site-specific plant materials, or use of seeds
6. Planting plan outlining species selection, planting locations and spacing, for each vegetation type to be restored
7. Planting methods, including containers, hydroseed or hydromulch, weed barriers and cages, as needed
8. Soil amendment recommendations
9. Irrigation plan, with proposed rates (in gallons per minute), schedule (i.e. recurrence interval), and seasonal guidelines for watering
10. Site protection plan to prevent unauthorized access, accidental damage and vandalism
11. Weeding and other vegetation maintenance tasks and schedule, with specific thresholds for acceptance of invasive species
12. Performance standards by which successful completion of mitigation can be assessed in comparison to a relevant baseline or reference site, and by which remedial actions will be triggered; success criteria shall include the minimum performance standards described in Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover, Mitigation Measure 4.6-1e: Avoidance and Minimization Measures for Special-status Plants, Mitigation Measure 4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly, Mitigation Measure 4.6-1h: Avoidance and

Minimization Measures for Western Burrowing Owl, Mitigation Measure 4.6-1m: Avoidance and Minimization Measures for Native Stands of Monterey Pine, Mitigation Measure 4.6-1o: Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander and Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas.

13. Monitoring methods and schedule

14. Reporting requirements and schedule

15. Adaptive management and corrective actions to achieve the established success criteria

16. Educational outreach program to inform operations and maintenance departments of local land management and utility agencies of the mitigation purpose of restored areas to prevent accidental damages

17. Description of any other compensatory mitigation in the form of land purchase, establishment of conservation easements or deed restrictions, contribution of funds in lieu of active restoration, or purchase of mitigation bank credits, or other means by which the mitigation site will be preserved in perpetuity.

Mitigation Measure 4.6-1o applies to the MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline and Castroville Pipeline Optional Alignments, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas.

Mitigation Measure 4.6-1o: Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander.

A preconstruction survey for California red-legged frog and California tiger salamander shall be conducted by a qualified biologist in suitable habitat where there is a moderate to high potential for these species to occur prior to vegetation removal or grading, as specified below:

1. Prior to conducting the surveys, the qualified biologist shall prepare a relocation plan that describes the appropriate survey and handling methods for California red-legged frog and California tiger salamander, and identifies nearby relocation sites where individuals would be relocated if found during the preconstruction surveys. The relocation plan shall be submitted to USFWS and CDFW for approval prior to the start of construction activities. The animal shall be relocated to a similar type of habitat or better from where it was relocated and shall only be relocated with authorization from USFWS and CDFW, as appropriate.

2. Preconstruction surveys shall be conducted within 5 days prior to, and immediately prior to, vegetation removal, grading, or installation of exclusion fence to identify any California red-legged frog, California tiger salamander, and any small mammal burrows.

3. Small mammal burrows identified during preconstruction surveys shall be surveyed (through hand-excavation, scoping, or other suitable methods to be determined in

consultation with USFWS and CDFW) to identify any California red-legged frog or California tiger salamander. Once the burrow is confirmed to be vacant, the burrow shall be collapsed.

4. If California red-legged frog or California tiger salamander are observed within the construction area, a qualified biologist shall relocate the individual according to the relocation plan above and only with authorization from USFWS and CDFW, as appropriate.

5. Exclusion fencing shall be installed around construction areas where there is a moderate to high potential for these species to occur as specified in **Mitigation Measure 4.6-1c (General Avoidance and Minimization Measures)** and only with authorization from USFWS and CDFW.

6. The qualified biologist shall monitor vegetation removal and grading inside the exclusion fence as specified in **Mitigation Measure 4.6-1c (General Avoidance and Minimization Measures)**.

7. If take authorization is not obtained from CDFW and USFWS for California tiger salamander, then all small mammal burrows within dispersal distance of a known or potential breeding pond shall be avoided by a minimum buffer of 50 feet.

Upon completion of construction activities, CalAm shall restore California tiger salamander and California red-legged frog habitat temporarily impacted during construction. Compensatory mitigation for permanent impacts shall be provided either onsite or offsite at a minimum ratio of 2:1. Compensation for permanent impacts may be in the form of permanent on-site or off-site creation, restoration, enhancement, or preservation of habitat. At a minimum, the restoration or compensation sites shall meet the following performance standards by the fifth year following restoration:

a. Temporarily impacted areas are returned to pre-project or improved conditions;

b. Vegetation cover shall be at least 80 percent of baseline vegetation cover in the impact area; and

c. No more cover by invasive plants than in the baseline conditions of the impact area.

Restoration and mitigation activities shall be described in the Habitat Mitigation and Monitoring Plan prescribed by **Mitigation Measure 4.6-1n (Habitat Mitigation and Monitoring Plan)**. Alternatively, compensatory credits may be purchased through an approved mitigation bank, or approved Habitat Conservation Plan.

Mitigation Measure 4.6-1p applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, and staging areas.

Mitigation Measure 4.6-1p: Control Measures for Spread of Invasive Plants.

Construction best management practices shall be implemented in construction areas within or adjacent to lands with native plant communities that may be susceptible to non-native plant species invasion to prevent the spread of invasive plants, seed, propagules, and pathogens through the following actions:

1) Avoid driving in or operating equipment in weed-infested areas outside of fenced work areas and restrict travel to established roads.

2) Avoid leaving exposed soil or construction materials in areas with the potential for invasive plants (e.g., in staging areas). Non-active stockpiles shall be covered with plastic or a comparable material.

3) Clean tools, equipment, and vehicles before transporting materials and before entering and leaving worksites (e.g., wheel washing stations at Project site access points). Inspect vehicles and equipment for weed seeds and/or propagules stuck in tire treads or mud on the vehicle to minimize the risk of carrying them to unaffected areas. Designate areas within active construction sites for cleaning and inspections.

4) An environmental inspector, under direction of the Lead Biologist or appointed qualified biologist (see **Mitigation Measure 4.6-1a**) shall inspect vehicles and equipment prior to project initiation at applicable work areas (listed above) for weed seeds and plant fragments that could colonize within the site or be transported to other sites. At project initiation, all construction vehicles must be cleaned to remove soil and plant fragments at designated locations, and vehicles or equipment that are not clean shall be rejected until clear of weed seed and plant fragments. Wheel washing stations or other methods to remove and contain seeds or other plant fragments from vehicles, equipment, boots, and tools shall be established in designated areas.

5) All equipment and tools involved in soil disturbance at applicable work areas shall be disinfected using a 10% bleach or 70% isopropyl alcohol solution prior to initial use or prior to returning to applicable work areas if used on another project site.

6) Only certified, weed-free, plastic-free imported erosion control materials (or rice straw in upland areas) shall be used for the project.

7) Within U.S. Army-owned land, control measures for invasive species also shall conform to guidelines in the Integrated Natural Resource Management Plan (INRMP) Presidio of Monterey and Ord Military Community (e.g., Section 9.2.4, Undesirable Plant Pests).

This measure also applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1q applies to HDD installation of the Castroville Pipeline beneath Tembladero Slough.

Mitigation Measure 4.6-1q: Frac-out Contingency Plan.

CalAm shall retain a licensed geotechnical engineer to develop a Frac-out Contingency Plan (Plan). CalAm will submit the plan to the appropriate resource agencies (CDFW, CCRWQCB, USACE, USFWS, NMFS, and local agencies with land use jurisdiction) for approval prior to the start of construction of any pipeline that will use HDD installation. The Plan shall be implemented at all areas where HDD installation under a waterway would occur to avoid, minimize, or mitigate for project impacts either prior to, concurrently with, or following HDD installation, as specified in the Plan. The plan shall include, at a minimum:

1) Measures describing training of construction personnel about monitoring procedures, equipment, materials and procedures in place for the prevention, containment, clean-up (such as creating a containment area and using a pump, using a vacuum truck, etc.), and disposal of released bentonite slurry, and agency notification protocols;

2) Methods for preventing frac-out including maintaining pressure in the borehole to avoid exceeding the strength of the overlying soil.

3) Methods for detecting an accidental release of bentonite slurry that include: (a) monitoring by a minimum of one biological monitor throughout drilling operations to ensure swift response if a frac-out occurs; (b) continuous monitoring of drilling pressures to ensure they do not exceed those needed to penetrate the formation; (c) continuous monitoring of slurry returns at the exit and entry pits to determine if slurry circulation has been lost; and (d) continuous monitoring by spotters to follow the progress of the drill bit during the pilot hole operation, and reaming and pull back operations.

4) Protocols CalAm and/or its contractors will follow if there is a loss of circulation or other indicator of a release of slurry.

5) Cleanup and disposal procedures and equipment CalAm and/or its contractors will use if a frac-out occurs.

6) If a frac-out occurs, CalAm and/or its contractors shall immediately halt work, implement the measures outlined in Item 5 of the Plan to contain, clean-up, and dispose of the bentonite slurry, and notify and consult with the staffs of the agencies listed above before HDD activities can begin again.

CalAm shall implement this plan to ensure that measures are implemented to prevent frac-out and if a frac-out occurs, then CalAm and/or its contractor shall implement measures to contain, clean-up, and dispose of the bentonite slurry.

Mitigation Measure 4.12-1b applies to the subsurface slant wells and Source Water Pipeline west of Highway 1.

Mitigation Measure 4.12-1b (General Noise Controls for Construction Equipment)

(See Impact 4.12-1 in Section 4.12, Noise and Vibration, for description.)

Mitigation Measure 4.14-2 applies to subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline), and New Transmission Main and New Transmission Main Optional Alignment.

Mitigation Measure 4.14-2: Site-Specific Nighttime Lighting Measures.

(See Impact 4.14-2 in Section 4.14, Aesthetic Resources, for description.)

Impact 4.6-2: Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during construction. (*Less than Significant with Mitigation*)

This impact addresses impacts on the sensitive natural communities (including riparian habitat) and ESHA described in Section 4.6.1.5, and on designated critical habitat, described in Section 4.6.1.9. Section 4.6.1.10, Sensitive Terrestrial Biological Resources in the Project Area, above, describes how sensitive natural communities and ESHA are distributed throughout the project area.

Table 4.6-4 in Section 4.6.2.3, Regulatory Framework, above, presents an evaluation of project consistency with the applicable LCP policies that relate to ESHAs. Wetlands and other waters may also be considered ESHAs and sensitive natural communities; however, potential impacts on wetlands or other waters are addressed below under Impact 4.6-3.

Consultation will include addressing any destruction or adverse modification of critical habitat that is described in Section 4.6.2.1, Federal Regulations. Impacts within critical habitat are generally only considered significant if they adversely affect the primary constituent habitat elements required by the corresponding species.

Sensitive communities, ESHA, and critical habitat within or adjacent to project construction areas could be temporarily or permanently impacted during project construction. A discussion of the potential construction-related impacts on sensitive communities, ESHA, and critical habitat associated with each project facility is provided below.

Impact acreages are provided below for each facility when appropriate and are provided as an approximation based on the current proposed project footprint. Since many of the facilities overlap, the impact acreages provided below may overlap with the impact acreages for other facilities and optional alignments. The final impact acreages for the entire project would be based on whether the proposed project uses the proposed alignments or optional alignments.

Subsurface Slant Wells

Sensitive Natural Communities. Central dune scrub occurs in and around the subsurface slant well site. As described in Section 4.6.1.4, Vegetation Communities and Habitat Types, central dune scrub in this area varies between relatively undisturbed central dune scrub, formerly disturbed sand dunes that are revegetating with native and non-native dune scrub vegetation, and unvegetated disturbed sandy soil in actively mined areas.

As described in Section 3.3.2 of Chapter 3, Description of the Proposed Project, slant well construction would disturb approximately 9 acres in the CEMEX mining area. The 9-acre area includes 8 acres for temporary staging, materials, storage, stockpiling areas, and spoils placement (as described for the subsurface slants wells in Impact 4.6-1) and 1 acre for new permanent above-ground facilities. A portion of this construction footprint overlaps with a portion of the construction footprints for the Source Water Pipeline and Source Water Pipeline using the optional alignment. The majority of this disturbance area is central dune scrub, although there are some existing disturbed areas. Slant well construction (including drilling, staging, and truck access) would temporarily disturb sensitive central dune scrub through direct removal of vegetation and changes to topography. Construction of the nine permanent subsurface slant wells in the CEMEX mining area is expected to take a total of 15 months to complete, but could occur anytime during the 24-month construction duration. Temporary disturbance to central dune scrub during construction would be a significant impact.

The components of the proposed subsurface slant wells that would be below the mean high water line would be within the MBNMS. Impacts to marine biological resources from the slant well components that would be located within the MBNMS are described in Section 4.5 Marine Biological Resources. The facility components that are evaluated in this section would be located above the mean high water line and outside of the MBNMS.

Within the 9-acre disturbance area, new permanent facilities would be constructed within central dune scrub. These permanent facilities include five new concrete pads with associated aboveground infrastructure at Well Sites 2 through 6; each well site would include one to three wellhead vaults, above-ground mechanical piping, an electrical control cabinet, and a pump-to-waste vault. A graded access road also would be constructed. These features would result in the permanent loss of approximately 1.0 acre of central dune scrub. The remaining 8 acres would be temporarily disturbed.[24]

Environmentally Sensitive Habitat Areas. Construction of the subsurface slant wells would occur in the coastal zone and would be subject to the City of Marina LCLUP. As described in Section 4.6.1.10, Sensitive Terrestrial Biological Resources in the Project Area, the entire subsurface slant well area would likely be considered primary habitat protected under the City of Marina's LCLUP and ESHA by the CCC. Construction of subsurface slant wells would result in the permanent loss of approximately 1.0 acre and temporary loss of approximately 8.0 acres of primary habitat/ESHA. Temporary and permanent disturbance to ESHA would be a significant impact.[25]

Critical Habitat. Subsurface slant well construction would occur outside of western snowy plover critical habitat and would not result in direct impacts on critical habitat. However, conversion of the test slant well to a permanent well and construction of aboveground facilities at Site 1 would occur approximately 240 feet east of critical habitat for western snowy plover. Slant well construction could indirectly impact the primary constituent elements of this critical habitat if worker foot traffic extends beyond the designated construction work area, if trash and debris is

[24] Impacts from maintenance activities on central dune scrub are analyzed in Impact 4.6-7. Maintenance of the subsurface slant wells every five years would result in the permanent loss of approximately 6 acres of central dune scrub. This maintenance area is assumed to be located within the 8-acre temporary construction footprint. Therefore, the proposed project (including construction and maintenance) would result in a permanent impact to 7 acres and temporary impact to 2 acres of central dune scrub.

[25] Impacts from maintenance activities on primary habitat/ESHA are analyzed in Impact 4.6-7. Maintenance of the subsurface slant wells every five years would result in the permanent loss of approximately 6 acres of primary habitat/ESHA. This maintenance area is assumed to be located within the 8-acre temporary construction footprint. Therefore, the proposed project (including construction and maintenance) would result in a permanent impact to 7 acres and temporary impact to 2 acres of primary habitat/ESHA.

left behind following construction, or if invasive plant species are introduced or spread at the site. These indirect impacts on critical habitat would be significant.

Implementation of the following mitigation measures would reduce impacts on sensitive natural communities and critical habitat resulting from slant well construction to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1d (Protective Measures for Western Snowy Plover), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)**. These measures would reduce impacts on sensitive natural communities, ESHA, and critical habitat by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; requiring specific measures to avoid, minimize, and compensate for impacts on the western snowy plover such as avoiding the breeding season, installing a visual construction barrier for work conducted adjacent to breeding habitat during the breeding season to reduce human disturbance to plovers, conducting pre-construction surveys to determine if plovers are present and implementing minimization measures to minimize construction impacts on plovers, if present, and compensating for habitat loss to mitigate for temporary and permanent loss of habitat; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade sensitive habitat such as cleaning tools and equipment before entering and leaving worksites, avoiding driving or operating equipment in weed-infested areas, and covering non-active stockpiles; ensuring the project conforms to ESHA policies (including local coastal plan policies); and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

MPWSP Desalination Plant

The proposed MPWSP Desalination Plant is described in Chapter 3, Description of the Proposed Project, Section 3.2.2 and would be constructed on the upper terrace (approximately 25 acres) of a 46-acre vacant parcel on Charles Benson Road. This facility would be located outside of the MBNMS. It would take approximately 24 months to construct.

Sensitive Natural Communities. The majority of the MPWSP Desalination Plant site is non-native grassland; however, there is a small patch of yellow bush lupine scrub, a type of northern coastal scrub, located in the northeastern corner of the site. Construction of the MPWSP Desalination Plant would permanently impact approximately 0.06 acre of northern coastal scrub, which would be a significant impact. This community could also be indirectly impacted through the dispersal or spread of invasive plant species, which would be a significant impact.

Environmentally Sensitive Habitat Areas. The MPWSP Desalination Plant site is outside of the coastal zone and would not be subject to the Coastal Act.

Critical Habitat. There is no critical habitat at the 25-acre MPWSP Desalination Plant site. However, critical habitat for south/central California coast steelhead and tidewater goby occurs along the Salinas River, approximately 670 feet north of the proposed MPWSP Desalination Plant development area. Construction of the MPWSP Desalination Plant would not directly impact south/central California coast steelhead or tidewater goby critical habitat. However, soil-disturbing activities at the site could result in soil erosion and the migration of eroded soil and sediment downgradient towards the Salinas River. As discussed under Impact 4.3-1 in Section 4.3, Surface Water Hydrology and Water Quality, project construction activities that disturb more than 1 acre are subject to the NPDES Construction General Permit requirements. Per the requirements, a SWPPP would be prepared by a Qualified SWPPP Developer and a Qualified SWPPP Practitioner would oversee its implementation. The SWPPP, which would include site-specific erosion and stormwater control measures to be implemented during construction of the MPWSP Desalination Plant, would reduce or eliminate the off-site migration of pollutants and sediment. Mandatory compliance with the NPDES Construction General Permit would avoid substantial adverse effects on water quality in critical habitat along the Salinas River. Thus, the impact on critical habitat along the Salinas River would be less than significant, and no mitigation is necessary.

Implementation of the following mitigation measures would reduce impacts on sensitive natural communities resulting from construction of the MPWSP Desalination Plant to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)**. These measures would reduce impacts on sensitive natural communities by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade sensitive habitat such as cleaning tools and equipment before entering and leaving worksites, avoiding driving or operating equipment in weed-infested areas, and covering non-active stockpiles; and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

Pipelines and Other Conveyance Facilities North of Reservation Road

Source Water Pipeline

The Source Water Pipeline and Source Water Pipeline Optional alignments are described in Chapter 3, Description of the Proposed Project, Section 3.2.1.2. This facility would be located outside of the MBNMS. Construction of this pipeline would take approximately 6 months.

Sensitive Natural Communities. Central dune scrub occurs along the portions of the Source Water Pipeline alignment. As described in Section 4.6.1.4, Vegetation Communities and Habitat Types, the occurrence of central dune scrub in this area ranges from relatively undisturbed areas dominated by native species, to disturbed areas dominated by a combination of native and non-native invasive species.

Earthmoving activities associated with installation of the Source Water Pipeline could result in the temporary loss of approximately 6.7 acres of central dune scrub (upon completion of construction, the site would be graded and revegetated). A portion of the 6.7-acre central dune scrub impact area also falls within the new Desalinated Water Pipeline and Castroville Pipeline alignments described below and may overlap with some of the impact area for the subsurface slant wells described above. The movement of construction vehicles and equipment over vegetated areas, as well as inadvertent discharges of pollutants to these areas via stormwater runoff, could result in direct and indirect impacts on central dune scrub located within and adjacent to the construction work areas. Temporary and indirect impacts on central dune scrub would be significant.

Environmentally Sensitive Habitat Areas. Undeveloped areas within the coastal zone in the City of Marina would likely be considered primary habitat under the City of Marina LCLUP and ESHA by the CCC. Undeveloped areas outside of the City of Marina, but within the coastal zone may be designated as ESHA under the North County Land Use Plan Local Coastal Program and by the CCC. Earthmoving activities associated with installation of the Source Water Pipeline could result in the temporary impacts on approximately 11.8 acres of ESHA (including areas that may be considered primary habitat by the City of Marina) similar to the impacts described above for sensitive natural communities. A portion of this impact area also falls within the new Desalinated Water Pipeline and Castroville Pipeline alignments described below and may overlap with some of the impact area for the subsurface slant wells described above. Temporary disturbance of ESHA would be significant.

Critical Habitat. Critical habitat for western snowy plover is located outside of and approximately 240 feet west of the western end of the Source Water Pipeline project area. Installation of the Source Water Pipeline would not result in direct impacts on critical habitat. However, pipeline installation could indirectly impact the nearby primary constituent elements of critical habitat for western snowy plover if construction worker foot traffic extends beyond the designated construction area, if trash and debris is left behind following construction, and/or if invasive plant species are introduced or spread at the site. These indirect impacts on critical habitat would be significant.

Implementation of the following mitigation measures would reduce impacts on sensitive natural communities and critical habitat associated with construction of the Source Water Pipeline to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1d (Protective Measures for Western Snowy Plover)**, **4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)**. As summarized above in the impact discussion for the subsurface slant wells, these measures would reduce impacts on sensitive natural communities, ESHA, and critical habitat by requiring implementation of general and specific protective measures.

Since the Source Water Pipeline and Source Water Pipeline using the optional alignment would impact the same type and the same amount of sensitive natural community habitat and ESHA, the same impacts and mitigation measures would apply to the Source Water Pipeline using the optional alignment as apply to the Source Water Pipeline.

New Desalinated Water Pipeline

The Desalinated Water Pipeline is described in Chapter 3, Description of the Proposed Project, Section 3.2.3.3. This facility would be located outside of the MBNMS. The construction footprint is approximately 35.4 acres. A portion of the construction footprint for the new Desalinated Water Pipeline overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, Castroville Pipeline, Castroville Pipeline using the optional alignment 1, and Castroville Pipeline using the optional alignment 2. Construction of this pipeline, combined with the new Transmission Main described below, would take approximately 15 months.

Sensitive Natural Communities. Central dune scrub, coast live oak woodland, and riparian woodland and scrub occur along portions of the Desalinated Water Pipeline alignment. Central dune scrub and coast live oak woodland in this alignment are relatively disturbed and are dominated by a combination of native and non-native invasive species. Riparian woodland and scrub forms a riparian corridor along the Locke-Paddon Park pond.

Earthmoving activities associated with installation of the Desalinated Water Pipeline could result in the temporary loss of approximately 9.4 acres of central dune scrub, 0.2 acre of coast live oak woodland, and 0.4 acre of riparian woodland and scrub (upon completion of construction, the site would be graded and revegetated to its pre-construction condition). A portion of the 9.4-acre central dune scrub impact area also falls within the Source Water Pipeline alignment described above and Castroville Pipeline alignment described below. The movement of construction vehicles and equipment over vegetated areas, as well as inadvertent releases of pollutants to these areas via stormwater runoff, could result in direct and indirect impacts on central dune scrub, coast live oak woodland, and riparian woodland and scrub located within and adjacent to the construction corridor. These communities could also be indirectly impacted through the dispersal or spread of invasive plant species, which would be a significant impact. Temporary and indirect impacts on central dune scrub, coast live oak woodland, and riparian woodland and scrub would be significant.

Environmentally Sensitive Habitat Areas. Undeveloped areas within the City of Marina would likely be considered primary habitat under the City of Marina LCLUP and ESHA by the CCC. Undeveloped areas outside of the City of Marina, but within the coastal zone, may be designated as ESHA under the North County Land Use Plan Local Coastal Program and/or by the CCC. Earthmoving activities associated with installation of the Desalinated Water Pipeline could result in the temporary impacts on approximately 16.9 acres of ESHA (including areas that may be considered primary habitat by the City of Marina) similar to the impacts described above for sensitive natural communities. A portion of this impact area also falls within the Source Water Pipeline alignment described above and Castroville Pipeline alignment described below. Temporary disturbance of ESHA would be significant.

Critical Habitat. There is no critical habitat within, or adjacent to, the Desalinated Water Pipeline alignment. Therefore, installation of the Desalinated Water Pipeline would have no impact on critical habitat.

Implementation of the following mitigation measures would reduce impacts on sensitive natural communities associated with installation of the Desalinated Water Pipeline to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)**.

These measures would reduce impacts on sensitive natural communities, ESHA, and critical habitat by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade sensitive habitat such as cleaning tools and equipment before entering and leaving worksites, avoiding driving or operating equipment in weed-infested areas, and covering non-active stockpiles; ensuring the project conforms to ESHA policies (including local coastal plan policies); and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

Since the new Desalinated Water Pipeline and new Desalinated Water Pipeline using the optional alignment would impact the same type and the same amount of sensitive natural community habitat and ESHA, the same impacts and mitigation measures would apply to the new Desalinated Water Pipeline using the optional alignment as apply to the new Desalinated Water Pipeline.

Castroville Pipeline

The Castroville Pipeline and Castroville Optional alignments (1 and 2) are described in Chapter 3, Description of the Proposed Project, Section 3.2.3.9. This facility would be located outside of the MBNMS. The construction footprint is approximately 15.0 acres. A portion of the Castroville Pipeline construction footprint overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, new Desalinated Water Pipeline, and new Desalinated Water Pipeline using the optional alignment. Construction of this pipeline would take approximately 4 months.

Sensitive Natural Communities. Central dune scrub, northern coastal scrub, riparian woodland and scrub, and freshwater marsh occur along the Castroville Pipeline alignment. The central dune scrub and northern coastal scrub areas are relatively isolated and somewhat disturbed. The riparian woodland and scrub and freshwater marsh occur in association with the Salinas River, in an isolated patch along the pipeline, and in an area north of Tembladero Slough.

The pipeline would be installed on the underside of an existing bridge over the Salinas River and beneath Tembladero Slough using HDD techniques to avoid direct impacts on those features, but would be installed using open trench techniques for the remainder of the pipeline. Earthmoving activities associated with installation of the Castroville Pipeline could result in the temporary loss of approximately 0.004 acre of central dune scrub, 0.15 acre of northern coastal scrub, and 0.9 acre of riparian woodland and scrub (upon completion of construction, the site would be revegetated to its pre-construction condition, although the pipeline would remain). A portion of the 0.004-acre central dune scrub impact area also falls within the Source Water Pipeline and new Desalinated Water Pipeline alignments described above. The movement of construction vehicles and equipment over vegetated areas, as well as inadvertent releases of pollutants to these areas via stormwater runoff, could result in direct and indirect impacts on central dune scrub, northern coastal scrub, riparian woodland and scrub, and freshwater marsh located within and adjacent to the construction corridor. These communities could also be indirectly impacted through the dispersal or spread of invasive plant species, which would be a significant impact. Temporary and indirect impacts on central dune scrub, northern coastal scrub, riparian woodland and scrub, and freshwater marsh would be significant.

Environmentally Sensitive Habitat Areas. A small segment of the proposed Castroville Pipeline alignment is located within the coastal zone. Undeveloped areas within this area may be designated as ESHA under the North County Land Use Plan Local Coastal Program and by the CCC. Earthmoving activities associated with installation of the Castroville Pipeline could result in temporary impacts on approximately 0.4 acre of ESHA similar to the impacts described above for sensitive natural communities. A portion of the impact area also falls within the Source Water Pipeline and new Desalinated Water Pipeline alignments described above. Temporary disturbance of ESHA would be significant.

Critical Habitat. The Castroville Pipeline would be installed on the underside of an existing bridge over the Salinas River using a barge and beneath Tembladero Slough using HDD. The Salinas River and Tembladero Slough are part of the south/central California coast steelhead Salinas Hydrologic critical habitat unit. The Salinas River is within the tidewater goby Unit MN-2 (Salinas River) critical habitat unit. As discussed under Impact 4.3-1 in Section 4.3, Surface Water Hydrology and Water Quality, a SWPPP would be prepared, which would include site-specific erosion and stormwater control measures (such as installing sediment barriers like silt fencing and fiber rolls and maintaining equipment and vehicles used for construction) to be implemented during construction of the Castroville Pipeline, which would reduce or eliminate the off-site migration of pollutants and sediment. Mandatory compliance with the SWPPP would avoid substantial adverse effects from upland erosion on water quality in critical habitat along the Salinas River and Tembladero Slough. If a frac-out occurs during HDD, bentonite slurry could be released into Tembladero Slough, which could degrade water quality and adversely impact steelhead critical habitat (Tembladero Slough), a significant impact. Use of the barge to install the pipeline over the Salinas River would have a relatively small, short-term increase in shading, so impacts from the barge would be less than significant.

Implementation of the following mitigation measures would reduce impacts on sensitive natural communities associated with installation of the Castroville Pipeline to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-1q (Frac-out Contingency Plan)**, **4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)**. These measures would reduce impacts on sensitive natural communities, ESHA, and critical habitat by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade sensitive habitat such as cleaning tools and equipment before entering and leaving worksites, avoiding driving or operating equipment in weed-infested areas, and covering non-active stockpiles; requiring preparation of a Frac-out Contingency Plan and implementation of measures in the Plan to contain and clean-up any frac-outs in waterways to minimize impacts of frac-outs on sensitive habitat; ensuring the project conforms to ESHA policies (including local coastal plan policies); and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

The Castroville Pipeline using the optional alignment 1 would impact approximately 0.9 acre of riparian woodland and scrub, 0.01 acre of freshwater marsh, and 0.15 acre of northern coastal scrub. The Castroville Pipeline using the optional alignment 2 would impact approximately 0.9 acre of riparian woodland and scrub and 0.15 acre of northern coastal scrub. Both optional alignments would impact the same amount of ESHA as the Castroville Pipeline. The Castroville Pipeline using the optional alignments would generally result in the same type of impact as described for the Castroville Pipeline. The same impact conclusion and mitigation measures would apply to the Castroville Pipeline using the optional alignments as apply to the Castroville Pipeline.

Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond

The Brine Discharge Pipeline and Brine Mixing Box and the Pipeline to CSIP Pond are described in Sections 3.2.2.5 and 3.2.3.10, respectively, of Chapter 3, Description of the Proposed Project. These facilities would be located outside of the MBNMS. The Brine Discharge Pipeline would take approximately 3 months to install, the Brine Mixing Box would take approximately 5 months to install, and the Pipeline to CSIP Pond would take approximately 2 months to install. The construction footprint for both of these pipelines and the Brine Mixing Box combined is approximately 7.4 acres, including the Brine Mixing Box construction staging area.

Sensitive Natural Communities. The proposed Brine Discharge Pipeline and Pipeline to CSIP Pond contain developed/landscaped and ruderal areas and a few patches of non-native grassland. The Brine Mixing Box would be installed in non-native grassland. No sensitive natural communities were identified within these construction footprints during reconnaissance level surveys conducted in preparation of this EIR/EIS. No impact on sensitive natural communities would result from construction of the Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond, and no mitigation is necessary.

Environmentally Sensitive Habitat Areas. The proposed Brine Discharge Pipeline, Pipeline to CSIP Pond, and Brine Mixing Box are outside of the coastal zone and would not be subject to the Coastal Act.

Critical Habitat. There is no critical habitat within the proposed Brine Discharge Pipeline and Pipeline to CSIP Pond alignments or the Brine Mixing Box construction footprint. The Salinas River, which is designated as critical habitat for south/central California coast steelhead and tidewater goby, is located approximately 1,200 feet north of the northern terminus of both pipelines. Construction of the Brine Discharge Pipeline and Pipeline to CSIP Pond would not result in significant indirect impacts on south/central California coast steelhead and tidewater goby critical habitat. Similar to the discussion above for the MPWSP Desalination Plant, pipeline and Brine Mixing Box installation activities would also be subject to the NPDES Construction General Permit requirements and the SWPPP would include erosion and stormwater control measures to be implemented during construction. These measures would help to prevent pollutants and sediment generated during installation activities from migrating downstream and entering the Salinas River. Mandatory compliance with the NPDES Construction General Permit would avoid substantial adverse effects on water quality in critical habitat along the Salinas River. Thus, the impact on critical habitat along the Salinas River would be less than significant, and no mitigation is necessary.

Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline)

The proposed ASR Facilities are described in Chapter 3, Description of the Proposed Project, Section 3.2.4. These facilities would be located outside of the MBNMS. Construction of the ASR-5 and ASR-6 Wells would take approximately 12 months. Construction of the ASR Pipelines (ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline) would take approximately 5 months. The construction footprint for both of the ASR Wells is expected to be approximately 0.9 acre. The construction footprint of the area where water would be conveyed is approximately 7.0 acres. The construction footprint for all three ASR pipelines is approximately 8.8 acres. A portion of the construction footprint for the ASR pipelines overlaps with a portion of the construction footprints for the new Transmission Main and the new Transmission Main using the optional alignment.

Sensitive Natural Communities. Coast live oak woodland and central maritime chaparral occur at the various proposed ASR facility sites. In the vicinity of these proposed facility sites, these communities occur on sandy soils and are dominated by native species.

Coast live oak woodland occurs at the proposed ASR-5 and ASR-6 Well sites. Construction of the ASR-5 and ASR-6 Wells would likely result in the temporary loss of up to 0.9 acre of coast live oak woodland and permanent loss of up to 0.04 acre of coast live oak woodland. The temporary and permanent loss of oak woodland would be a significant impact. In addition, water produced during development of the ASR-5 and ASR-6 Wells would be conveyed to a natural depression located east of the intersection of San Pablo Avenue and General Jim Moore Boulevard that includes central maritime chaparral. Conveyance of water to this area has potential to temporarily impact approximately 4.6 acres of central maritime chaparral. However, implementation of the mitigation measures prescribed below would reduce the impact to a less-than-significant level.

The ASR Pipelines would be constructed within the developed General Jim Moore Boulevard and would not have a direct temporary or permanent impact any sensitive natural communities. However, coast live oak woodland, northern coastal scrub, and central maritime chaparral border portions of the pipeline alignments and could be indirectly impacted during construction from accidental foot traffic or equipment use outside of the construction boundary or the introduction or spread of invasive plant species. Temporary impacts on oak woodland, northern coastal scrub, and central maritime chaparral are considered significant.

Environmentally Sensitive Habitat Areas. The proposed ASR Facilities would be located outside of the coastal zone and would not be subject to the Coastal Act.

Critical Habitat. No critical habitat occurs within the proposed ASR Facilities. Monterey spineflower critical habitat occurs approximately 50 feet east of the area where the water produced during development of the ASR-5 and ASR-6 Wells would be conveyed to and percolated into the ground. Construction of these ASR facilities would remain outside of critical habitat and would not impact critical habitat. No impact would result, and no mitigation is necessary.

Implementation of the following mitigation measures would reduce impacts on sensitive natural communities at the proposed ASR Facilities to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)**. As summarized above in the impact discussion for the MPWSP Desalination Plant, these measures would reduce impacts on sensitive natural communities by requiring implementation of general and specific protective measures.

Pipelines and Other Conveyance Facilities South of Reservation Road

New Transmission Main

The new Transmission Main and new Transmission Main Optional alignments are described in Chapter 3, Description of the Proposed Project Proposed, Section 3.2.3.4, of this EIR/EIS. This facility would be located outside of the MBNMS. Construction of this pipeline and the new Desalinated Water Pipeline would take approximately 15 months to complete. The construction footprint is approximately 27.1 acres. A portion of the new Transmission Main construction footprint overlaps with a portion of the ASR pipelines construction footprint.

Sensitive Natural Communities. Central dune scrub, coast live oak woodland, and northern coastal scrub occur along the new Transmission Main alignment. The occurrence of central dune scrub in this area ranges from areas dominated by non-native species to areas with higher cover of native dune scrub species. Coast live oak woodland and northern coastal scrub along the alignment is interspersed with single family residences.

Installation of the Transmission Main would temporarily impact approximately 1.9 acres of central dune scrub and 0.07 acre of coast live oak woodland through direct removal of vegetation during open-trench excavation activities or from trampling of the vegetation from construction vehicle access. Additionally, central dune scrub, coast live oak woodland, and northern coastal scrub occur adjacent to the construction area and could be indirectly impacted if worker foot traffic were to extend beyond the designated construction work area, if trash and debris is left behind following construction, and/or if invasive plant species are introduced or spread at the site. No permanent impacts on central dune scrub would result from installation of the Transmission Main. Temporary impacts on central dune scrub, coast live oak woodland, and northern coastal scrub during construction would be significant.

Environmentally Sensitive Habitat Areas. The pipeline segment between the Highway 1 overcrossing and the Highway 1/Lightfighter Driver interchange is located within the coastal zone. Undeveloped areas within the coastal zone in the City of Marina may be considered primary habitat under the City of Marina LCLUP and ESHA by the CCC, undeveloped areas within the City of Seaside in the coastal zone may be designated as ESHA by the City of Seaside Local Coastal Program Land Use Plan and by the CCC, and undeveloped areas in the coastal zone and outside of a local coastal plan area may be considered ESHA by the CCC. Earthmoving activities associated with installation of the Transmission Main could result in temporary impacts on approximately 5.4 acres of ESHA (including areas that may be considered primary habitat by the City of Marina) similar to the impacts described above for sensitive natural communities. Temporary disturbance of ESHA would be significant.

Critical Habitat. The majority of the Transmission Main alignment is located a minimum of 150 feet east of Monterey spineflower critical habitat. Construction of the new Transmission Main would remain outside of critical habitat and would not impact critical habitat. No impact would result and no mitigation is necessary.

Implementation of the following mitigation measures would reduce temporary impacts on sensitive natural communities resulting from installation of the new Transmission Main to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas)**, and **4.6-2b (Avoid, Minimize and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)**. As summarized above in the impact discussion for the Desalinated Water Pipeline, these measures would reduce temporary impacts on sensitive natural communities by requiring implementation of general and specific protective measures.

Since the new Transmission Main and new Transmission Main using the optional alignment would impact the same type and approximately the same amount of sensitive natural community habitat (The new Transmission Main would impact approximately 1.9 acres of central dune scrub, while the Transmission Main using the optional alignment would impact approximately 1.4 acre of central dune scrub. Both alignments would impact the same amount of coast live oak woodland) and the same type and approximately the same amount of ESHA (the new Transmission Main would impact approximately 5.4 acres of ESHA, while the Transmission Main using the optional alignment would impact 5.7 acres of ESHA), the same impacts and mitigation measures would apply to the new Transmission Main using the optional alignment as apply to the new Transmission Main.

Carmel Valley Pump Station

The proposed Carmel Valley Pump Station is described in Section 3.2.3.8 of Chapter 3, Description of the Proposed Project. This facility would be located outside of the MBNMS. Construction would take approximately 6 months to complete. The construction footprint for the pump station and associated pipelines is approximately 0.2 acre.

Sensitive Natural Communities. The Carmel Valley Pump Station site includes non-native annual grassland, landscaped, and developed areas and does not contain any sensitive natural communities. No impact on sensitive natural communities would result. No mitigation is necessary.

Environmentally Sensitive Habitat Areas. The proposed Carmel Valley Pump Station site is outside of the coastal zone and would not be subject to the Coastal Act.

Critical Habitat. The Carmel Valley Pump Station site is located within California red-legged frog critical habitat unit MNT-2 (Carmel River). Non-native grassland within the Carmel Valley Pump Station site provides California red-legged frog upland habitat as described in Section 4.6.1.9. Construction of the Carmel Valley Pump Station would permanently impact 0.01 acre and temporarily impact 0.12 acre of non-native grassland upland habitat. This would be a significant impact on California red-legged frog critical habitat.

Steelhead critical habitat is located approximately 280 feet south of the Carmel Valley Pump Station site. As discussed under Impact 4.3-1 in Section 4.3, Surface Water Hydrology and Water Quality, a SWPPP would be prepared, which would include site-specific erosion and stormwater control measures to be implemented during construction of the Carmel Valley Pump Station, which would reduce or eliminate the off-site migration of pollutants and sediment. Mandatory compliance with the SWPPP would avoid substantial adverse effects on water quality in critical habitat along the Carmel River. Thus, the impact on steelhead critical habitat along the Carmel River would be less than significant and no mitigation is necessary.

Impacts to critical habitat associated with construction of the Carmel Valley Pump Station would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1n**

(Habitat Mitigation and Monitoring Plan), 4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander), and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)**.

These measures would reduce impacts on sensitive natural communities and critical habitat by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

Ryan Ranch-Bishop Interconnection Improvements

The proposed Ryan Ranch–Bishop Interconnection Improvements are described in Section 3.2.3.11 of Chapter 3, Description of the Proposed Project. This facility would be located outside of the MBNMS. The construction footprint is approximately 7.3 acres.

Sensitive Natural Communities. The majority of the Ryan Ranch-Bishop Interconnection Improvements site is located within road right-of-ways, although a small extent of non-native grassland also occurs within the project area. Coast live oak woodland and northern coastal scrub occur adjacent to the Ryan Ranch-Bishop Interconnection Improvements project area. Construction of the Ryan Ranch-Bishop Interconnection Improvements could indirectly impact adjacent sensitive natural communities if worker foot traffic extends beyond the designated construction work area. Indirect impacts on sensitive natural communities would be significant.

Environmentally Sensitive Habitat Areas. The Ryan Ranch-Bishop Interconnection Improvements site is outside of the coastal zone and would not be subject to the Coastal Act.

Critical Habitat. No critical habitat occurs within the Ryan Ranch-Bishop Interconnection Improvements site. The closest critical habitat to this site is Monterey spineflower critical habitat located approximately 0.7 mile to the north and California red-legged frog critical habitat located approximately 1.0 mile to the south. Due to the distance between the anticipated construction disturbance area for the Ryan Ranch-Bishop Interconnection Improvements and the critical habitat, no impact would result from the construction of these improvements, and no mitigation is necessary.

Impacts to sensitive natural communities associated with construction of the Ryan Ranch-Bishop Interconnection Improvements would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program), 4.6-1c (General Avoidance and Minimization Measures), 4.6-1n (Habitat Mitigation and Monitoring Plan),** and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)**.These measures would reduce impacts on sensitive natural communities and critical habitat by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

Main System-Hidden Hills Interconnection Improvements

The proposed Main System-Hidden Hills Interconnection Improvements are described in Section 3.2.3.11 of Chapter 3, Description of the Proposed Project. This facility would be located outside of the MBNMS. The construction footprint for the Main System-Hidden Hills Interconnection Improvements is 1.1 acre.

Sensitive Natural Communities. The Main System-Hidden Hills Interconnection Improvements is located entirely within road right-of-ways and existing facilities and would not have direct impacts on sensitive natural communities. Coast live oak woodland occurs adjacent to the Main System-Hidden Hills Interconnection Improvements project area and could be indirectly affected if worker foot traffic extends beyond the designated construction work area. Indirect impacts on sensitive natural communities would be significant.

Environmentally Sensitive Habitat Areas. The Main System- Hidden Hills Interconnection Improvements site is outside of the coastal zone and would not be subject to the Coastal Act.

Critical Habitat. The Main System-Hidden Hills Interconnection Improvements site is located within California red-legged frog critical habitat. All construction activities would occur within paved or developed surfaces that do not contain the primary constituent elements for California red-legged frog described in Section 4.1.6.9. However, the adjacent coast live oak woodland provides upland dispersal habitat for California red-legged frog. Construction of the Main System-Hidden Hills Interconnection Improvements could indirectly impact adjacent critical habitat if worker foot traffic extends beyond the designated construction work area. Indirect impacts on critical habitat would be significant.

Impacts to sensitive natural communities and critical habitat associated with construction of the Main System-Hidden Hills Interconnection Improvements would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander),** and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)**.These measures would reduce impacts on sensitive natural communities and critical habitat by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

Staging Areas

The proposed Staging Areas are described in Section 3.3.1.2 of Chapter 3, Description of the Proposed Project. These facilities would be located outside of the MBNMS.

Sensitive Natural Communities. There are eight staging areas located throughout the project area. The majority of the staging areas are located within developed or highly disturbed areas. However, some staging areas contain northern coastal scrub and coast live oak woodland, which are considered sensitive natural communities. **Table 4.6-9** below describes which staging area contains, or is adjacent to, a sensitive natural community and the type of temporary impact. If sensitive natural communities occur in the staging area, use of the staging area could result in direct temporary loss of that community. Use of the staging areas could indirectly impact adjacent sensitive natural communities if worker foot traffic extends beyond the designated construction work area. Temporary direct or indirect impacts on central dune scrub, coast live oak woodland, and northern coastal scrub would be significant.

TABLE 4.6-9
CONSTRUCTION STAGING AREAS SENSITIVE NATURAL COMMUNITY IMPACTS

Location	Staging Area Footprint (acre)	Sensitive Natural Community Present	Estimated Temporary Impact on Sensitive Natural Communities
2nd Avenue/Lightfighter Drive in Seaside	0.5	Central Dune Scrub	Potential indirect impacts
West side of General Jim Moore Boulevard, near Gigling Road, in Seaside	0.3	Coast Live Oak Woodland	0.03 acre temporary impact
East side of General Jim Moore Boulevard, near Gigling Road, in Seaside	0.2	Coast Live Oak Woodland	0.002 acre temporary impact
West side of General Jim Moore Boulevard, near Seaside Middle School, in Seaside	0.1	Northern Coastal Scrub	0.1 acre temporary impact

Environmentally Sensitive Habitat Areas. The staging area located at Beach Road is located within the coastal zone in the City of Marina and undeveloped areas adjacent to the staging area may be considered primary habitat under the City of Marina LCLUP and ESHA by the CCC. Use of the staging area could result in indirect impacts on primary habitat/ESHA similar to the impacts described above for sensitive natural communities. These indirect impacts on primary habitat/ESHA would be significant.

Impacts to sensitive natural communities, including potential primary habitat/ESHA, associated with the use of the staging areas listed in **Table 4.6-9** would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program), 4.6-1c (General Avoidance and Minimization Measures), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas),** and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)**. These measures would reduce impacts on sensitive natural communities, ESHA, and critical habitat by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; ensuring the project conforms to ESHA policies (including local coastal plan policies); and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

No other staging areas have potential to impact sensitive natural communities or ESHA.

Critical Habitat. There is no critical habitat within, or adjacent to, any of the staging areas. Therefore, use of the staging areas would have no impact on critical habitat.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP construction could be inconsistent with applicable regulatory requirements related to sensitive natural communities, critical habitat, and ESHAs that were adopted for the purpose of avoiding or mitigating an environmental effect. Specifically, the project could be inconsistent with the FESA, the Coastal Act, City of Marina General Plan Policies 4.112, 4.114, 4.115, 4.116, 4.118, 4.119, 4.120, and 2.10; City of Marina LCLUP Policies 8, 19, 25, 26 and Planning Guideline entitled Rare and Endangered Species: Habitat Protection; Fort Ord Dunes State Park General Plan and Environmental Impact Report BIO-8; City of Seaside Local Coastal Program Land Use Plan Policies NCR-CZ 1.1.C, NCR-CZ 1.2.A, NCR-CZ 1.2.B, LUD-CZ 3.1.A, and LUD-CZ 3.1.B; Seaside General Plan Policies COS-4.1 and COS-4.3; Monterey County Carmel Valley Master Plan Policy CV-3.7; Monterey County Greater Monterey Peninsula Area Plan Policy GMP-3.9; Monterey County General Plan Policies OS-5.1, OS-5.2, OS-5.4, OS-5.5, OS-5.6, OS-5.11, OS-5.13, OS-5.16, OS-5.17, OS-5.23; Monterey County North County Land Use Plan Policies 2.3.2.1 through 2.3.2.6, 2.3.2.8, 2.3.2.9, 2.3.3.C2, NC-3.3, and NC-3.5, and Key Policy 4.3.4; Fort Ord Reuse Plan (Seaside) Biological Resources Policies A-4 and C-1; Fort Ord Reuse Plan (Monterey County) Biological Resources Policies A-9 and C-1; and California Coastal Act Section 30240, which were established to avoid or mitigate sensitive natural community, critical habitat, and ESHA impacts. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1d (Protective Measures for Western Snowy Plover), 4.6-1e (Avoidance and Minimization Measures for Special-status Plants), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander), 4.6-1p (Control Measures for Spread of Invasive Plants), 4.6-1q (Frac-out Contingency Plan), 4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)** would reduce impacts on sensitive natural communities, critical habitat and ESHA by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; requiring specific measures to avoid, minimize, and compensate for impacts on the western snowy plover such as avoiding the breeding season, installing a visual construction barrier for work conducted adjacent to breeding habitat during the breeding season to reduce human disturbance to plovers, conducting pre-construction surveys to determine if plovers are present and implementing minimization measures to minimize construction impacts on plovers, if present, and compensating for habitat loss to mitigate for temporary and permanent loss of habitat; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade sensitive habitat such as cleaning tools and equipment before entering and leaving worksites, avoiding driving or operating equipment in weed-infested areas, and covering non-active stockpiles; requiring preparation of a Frac-out Contingency Plan and implementation of measures in the Plan to contain and clean-up any frac-outs in waterways to minimize impacts of frac-outs on sensitive habitat; ensuring the project conforms to ESHA policies; and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat. Therefore, with these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirements.

Impact Conclusion

Impacts on sensitive natural communities and ESHA are described for each project facility above; however, portions of the work areas for some facilities overlap with the work area for other facilities. This section includes a summary of the overall project impacts on sensitive natural communities and ESHA, which accounts for areas of overlap. Overall, construction of the entire proposed project has the potential to temporarily impact approximately 23 acres and permanent impact approximately 1 acre of central dune scrub,[26] temporarily impact approximately 0.2 acre and permanently impact approximately 0.06 acre of northern coastal scrub, temporarily impact approximately 11 acres of central maritime chaparral, temporarily impact approximately 0.7 acre and permanently impact approximately 0.04 acre of oak woodland, temporarily impact approximately 0.06 acre of freshwater marsh, and temporarily impact approximately 1.3 acre of riparian woodland and scrub.

[26] Impacts from maintenance activities on central dune scrub are analyzed in Impact 4.6-7. Maintenance of the subsurface slant wells every five years would result in the permanent loss of approximately 6 acres of central dune scrub. This maintenance area is assumed to be located within the 8-acre temporary subsurface slant well construction footprint. The proposed project (including construction and maintenance) would result in a permanent impact on 7 acres of central dune scrub (from construction and maintenance of the subsurface slant wells) and temporary impact on 17 acres from construction of all facilities.

Overall, construction of the MPWSP would temporarily impact approximately 35 acres and permanently impact approximately 1 acre of ESHA.[27] Areas of ESHA overlap with the vegetation types described above in the coastal zone.

Construction of the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), new Transmission Main and new Transmission Main Optional Alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Staging Areas would result in less than significant impacts on riparian habitat, sensitive natural communities, ESHA, and/or critical habitat when mitigation measures are implemented.

The Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond would have less than significant impacts on riparian habitat, sensitive natural communities, ESHA, or critical habitat.

Overall, the impact on riparian habitat, sensitive natural communities, ESHA, and critical habitat, would be reduced to a less than significant level with implementation of the prescribed mitigation.

Mitigation Measures

Mitigation Measure 4.6-1a applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Staging Areas.

Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1b applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR

[27] Impacts from maintenance activities on primary habitat/ESHA are analyzed in Impact 4.6-7. Maintenance of the subsurface slant wells every five years would result in the permanent loss of approximately 6 acres of primary habitat/ESHA. This maintenance area is assumed to be located within the 8-acre temporary subsurface slant well construction footprint. The proposed project (including construction and maintenance) would result in a permanent impact on 7 acres of primary habitat/ESHA (from construction and maintenance of the subsurface slant wells) and temporary impact on 29 acres of from construction of all facilities.

Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Staging Areas.

Mitigation Measure 4.6-1b: Construction Worker Environmental Awareness Training and Education Program.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1c applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Staging Areas.

Mitigation Measure 4.6-1c: General Avoidance and Minimization Measures.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1d applies to the subsurface slant wells and Source Water Pipeline and Source Water Pipeline Optional Alignment.

Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1n applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Staging Areas.

Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1o applies to the Main System-Hidden Hills Interconnection Improvements and the Carmel Valley Pump Station.

Mitigation Measure 4.6-1o: Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1p applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Conveyance

Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline), and New Transmission Main and New Transmission Main Optional Alignment.

Mitigation Measure 4.6-1p: Control Measures for Invasive Plants.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1q applies to HDD installation of the Castroville Pipeline beneath Tembladero Slough.

Mitigation Measure 4.6-1q: Frac-out Contingency Plan

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-2a applies to the Subsurface Slant Wells, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, New Transmission Main and New Transmission Main Optional Alignment, and Staging Areas.

Mitigation Measure 4.6-2a: Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas.

Some parts of the project area occur within the Coastal Zone and development within the Coastal Zone would require a Coastal Development Permit. Prior to the initiation of ground-disturbing activities CalAm shall consult with the CCC or local jurisdiction and obtain the necessary permit(s) in order to proceed with the MPWSP. The CCC or local agency would authorize the project if it conforms to ESHA policies or other policies of the Coastal Act.

Mitigation Measure 4.6-2b applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Staging Areas.

Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas.

CalAm and/or its construction contractor(s) shall implement the following avoidance, minimization, and compensation measures for sensitive natural communities, the special-status species that utilize these sensitive communities, environmentally sensitive habitat areas (ESHA) as defined by the California Coastal Commission (CCC) or in a local coastal plan (LCP), and primary habitat as defined in the City of Marina’s Local Coastal Land Use Plan (LCLUP). Compensatory mitigation for permanent loss from periodic maintenance of the subsurface slant wells shall only be applied once and would not be applied for each five-year maintenance event.

a) Project facilities shall be sited and designed to avoid disturbance of central maritime chaparral, central dune scrub, coast live oak woodland, and riparian woodland and scrub, any areas defined as ESHA by the CCC or in a LCP, primary habitat as defined in the LCLUP, any sensitive communities defined by local jurisdictions, and any other sensitive natural communities, including critical habitat, identified within the project area.

b) Where direct impacts on sensitive natural communities, ESHA, primary habitat, or critical habitat cannot feasibly be avoided, CalAm shall implement the following measures:

   i. Any temporarily impacted sensitive natural communities, ESHA, primary habitat, and critical habitat, shall be restored to previous conditions or better at the end of construction. Compensatory mitigation for permanent impacts on sensitive natural communities shall occur at a ratio of 2:1 or greater. Compensation for loss of sensitive natural communities may be in the form of permanent on-site or off-site creation, restoration, enhancement, or preservation of habitat. At a minimum the restoration or compensation sites shall meet the following performance standards by the fifth year following restoration:

      a. Temporarily impacted areas are returned to pre-project conditions or greater

      b. Native vegetation cover shall be at least 70 percent of baseline/impact area native vegetation cover

      c. No more cover by invasives than the baseline/impact area

   Restoration and mitigation activities shall be described in the Habitat Mitigation and Monitoring Plan prescribed by Mitigation Measure 4.6-1n (Habitat Mitigation and Monitoring Plan).

   Alternatively, credits purchased through an approved mitigation bank, or approved Habitat Conservation Plan.

   ii. Topsoil shall be salvaged during grading and earthmoving activities, stockpiled separately from subsoil, and protected from erosion (e.g., covered or watered). Composting additives shall be used to amend the soil, if needed, and compacted topsoil shall be properly prepared prior to reuse for post-construction restoration of temporarily disturbed areas. A minimum of 12 inches of topsoil shall be salvaged (or if there is less than 12 inches of topsoil initially, as much as is available practicable).

   iii. For HMP sensitive natural communities on former Fort Ord lands, plants shall be salvaged, under the direction of a qualified biologist, as necessary per the requirements of the HMP, and in accordance with any requirements from USFWS and CDFW.

b) Any areas used for staging, laydown, material storage, equipment storage, job trailers, employee parking, or other project-related support activities that do not need to be located adjacent to the active construction area shall be located away from jurisdictional areas, sensitive communities, and shall be protected from stormwater runoff using temporary perimeter sediment barriers such as berms, silt fences, fiber rolls, covers, sand/gravel bags, and straw bale barriers.

c) All potential contaminants shall be stored on impervious surfaces, plastic ground covers, or in secondary containment to prevent any spills or leakage from contaminating the ground, and shall be located at least 100 feet from adjacent habitat, unless required for construction activities to be located adjacent to the active construction area.

d) Any spillage of pollutants or construction material shall be contained immediately in accordance with the project SWPPP. The contaminated area shall be cleaned and any contaminated materials properly disposed of. The Lead Biologist shall be notified of all spills.

Further, CalAm and/or its construction contractor(s) shall implement the following avoidance, minimization, and compensation measures for any areas that are identified as secondary habitat as defined in the City of Marina's LCLUP (and not within ESHA as defined by the CCC) through the coastal permitting process:

a) Development shall be designed to prevent significant adverse impacts on primary habitat areas. Adverse impacts that shall be avoided may include indirect impacts such as operational noise impacts on wildlife, introduction of the spread of invasive plant and wildlife species, increased erosion, introduction of trash that would invite predators, increased human disturbance, and decreased water quality.

b) All temporarily impacted areas shall be restored to pre-construction conditions or better at the end of construction. Compensatory mitigation for permanent impacts on sensitive natural communities shall occur at a ratio of 1:1 or greater. Compensation for loss of sensitive natural communities may be in the form of permanent on-site or off-site creation, restoration, enhancement, or preservation of habitat. At a minimum the restoration or compensation sites shall meet the following performance standards by the fifth year following restoration:

   i. Temporarily impacted areas are returned to pre-project conditions or greater

   ii. Native vegetation cover shall be at least 70 percent of baseline/impact area native vegetation cover

   iii. No more cover by invasives than the baseline/impact area

   Restoration and mitigation activities shall be described in the Habitat Mitigation and Monitoring Plan prescribed by Mitigation Measure 4.6-1n (Habitat Mitigation and Monitoring Plan).

   Alternatively, credits purchased through an approved mitigation bank, or approved Habitat Conservation Plan.

Impact 4.6-3: Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during construction. (*Less than Significant with Mitigation*)

This impact addresses impacts on federal wetlands, federal other waters, and/or waters of the state described in Sections 4.6.1.6 and 4.6.2.

A wetland delineation for the project has not been verified by the USACE, RWQCB, and CCC. For the purposes of this analysis, the project area was evaluated for the presence of waters of the U.S./waters of the state (including wetlands under CCC jurisdiction) through examination of NWI maps (USFWS, 2016) and field surveys conducted for the MPWSP by AECOM between 2014 and 2016 (AECOM, 2016), and by ESA in 2013, 2014, and 2016 (ESA, 2013, 2014, 2016), and a wetland delineation prepared for the proposed project (AECOM, 2017). Many potentially jurisdictional wetlands and waters occur within the study area such as riparian woodland and scrub, freshwater marsh, open water, and other small culverts and drainages. The proposed project may have direct effects on these potential waters of the U.S. and/or waters of the state. Direct impacts on those wetlands could include removal of vegetation, soil, or structures and/or the placement of fill in the wetland/other water, or hydrological modifications (i.e., altering the flow of water in or out of the wetland or water). Temporarily impacted areas include those areas that would be returned to pre-project conditions following construction. Permanently impacted areas include those areas that would be permanently lost following construction.

Waters of the U.S. and waters of the state occur off-site in close proximity to many project components and could be subject to indirect impacts as a result of project construction. Indirect impacts could occur if construction activities inadvertently extend beyond the designated construction work area, if construction worker foot traffic extends beyond the designated construction work area and into these features, and/or if trash and debris is left in the features following construction. Other indirect impacts include sedimentation as a result of increased soil erosion from grading or trenching activities and degradation of water quality from pollutants (e.g., oil, hydraulic fluid) that are conveyed by surface water runoff from the construction site to offsite waters of the U.S./waters of the state.

The following discussion of project-related impacts on waters of the U.S. and/or waters of the state is organized by facility.

Impact acreages are provided below for each facility when appropriate and are provided as an approximation based on the current proposed project footprint. Since many of the facilities overlap, the impact acreages provided below may overlap with the impact acreages for other facilities and optional alignments. The final impact acreages for the entire project would be based on whether the proposed project uses the proposed alignments or optional alignments.

Subsurface Slant Wells

The construction footprint for the subsurface slant wells is 9 acres. A portion of this construction footprint overlaps with a portion of the construction footprints for the Source Water Pipeline and Source Water Pipeline using the optional alignment. The components of the proposed subsurface slant wells that would be below the mean high water line would be within the MBNMS. Impacts to marine biological resources from the slant well components that would be located within the MBNMS are described in Section 4.5 Marine Biological Resources. The facility components that are evaluated in this section would be located above the mean high water line and outside of the MBNMS.

Construction of the subsurface slant wells is not expected to directly impact any waters of the U.S. or waters of the state as none occur within the subsurface slant well site in the CEMEX active mining area. Some potential waters of the U.S. and/or waters of the state are located in the vicinity of the slant well Site 1. The CEMEX dredging pond and Pacific Ocean are located over 350 feet from the slant well Site 1. Due to the distances between the construction work area and these potential waters of the U.S./waters of the state, construction activities would not be expected to inadvertently extend beyond the construction work area and impact these features. Moreover, implementation of BMPs in the project-specific SWPPP would require measures to manage soil erosion and protect water quality that would avoid impacts on water quality in these potential wetlands/waters. Therefore, impacts on the CEMEX dredging pond and Pacific Ocean during conversion of the test slant well to a permanent slant well and construction of the aboveground facilities at Site 1 would be less than significant and no mitigation is necessary.

The CEMEX settling ponds are located approximately 50 feet from the slant well Site 1. Indirect impacts on water quality are not expected as the settling ponds are surrounded by berms and are not downgradient of the slant well construction work area. Additionally, mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would protect water quality. However, due to proximity of the ponds to the slant well site, potentially significant impacts could result from construction-related activity extending beyond the designated construction work area and into these features.

Implementation of the following mitigation measures would reduce the potential impact on the CEMEX settling ponds to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program),** and **4.6-1c (General Avoidance and Minimization Measures)**. These measures would reduce impacts on potentially jurisdictional waters by designating a lead biologist to oversee and ensure implementation of jurisdictional waters protective measures; requiring worker training regarding jurisdictional waters potentially present to ensure that workers are aware of jurisdictional waters that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; and requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent jurisdictional waters and other measures to avoid and minimize impacts on jurisdictional waters.

MPWSP Desalination Plant

No waters of the U.S. or waters of the state exist within the 25-acre[28] MPWSP Desalination Plant site. Therefore, construction of the desalination plant and supporting facilities would not result in direct impacts on waters of the U.S. and/or waters of the state. The Salinas River is located about 670 feet to the north of the site and freshwater forested/shrub wetland mapped by the NWI is located about 110 feet north of the site. Due to the distances between the construction work area and these features, it is unlikely that construction activities would inadvertently extend beyond the construction work area and directly impact these features. Soil disturbing activities at the site

[28] As stated in Section 3.2.2 of Chapter 3, Description of the Proposed Project, all proposed project facilities would be constructed on the upper terrace (25 acres) of the 46-acre parcel.

could increase soil erosion and the eroded soil could migrate downgradient to the potential wetland and the Salinas River. However, mandatory compliance with the NPDES Construction General Permit, including implementation of BMPs in the project's SWPPP, would manage soil erosion and protect water quality, thereby avoiding significant impacts on water quality in the potential wetland and the Salinas River. Therefore, the impact on the Salinas River and the potential wetland would be less than significant and no mitigation is necessary.

The MPWS Desalination Plant would be located outside of the MBNMS.

Pipelines and Other Conveyance Facilities North of Reservation Road

Source Water Pipeline

The construction footprint for the Source Water Pipeline is approximately 16.4 acres. A portion of this footprint overlaps with a portion of the construction footprints for the subsurface slant well, Castroville Pipeline, Castroville Pipeline using the optional alignment 1, Castroville Pipeline using the optional alignment 2, the new Desalinated Water Pipeline, and the new Desalinated Water Pipeline using the optional alignment. The Source Water Pipeline would be located outside of the MBNMS.

Several waters of the U.S./waters of the state occur in the vicinity of the proposed Source Water Pipeline alignment. The Pacific Ocean and the CEMEX dredging pond are located over 350 feet to the north and west of the western terminus of the proposed Source Water Pipeline alignment. A third feature mapped as a freshwater emergent wetland by the NWI is located west of Lapis Road, east of Highway 1, and northeast of the CEMEX access road, approximately 160 feet west of the proposed Source Water Pipeline alignment. A fourth feature mapped as a freshwater emergent wetland by the NWI is located south of the CEMEX access road, approximately 580 feet south of the proposed pipeline alignment. Due to the distances between the construction work area and these features, it unlikely that construction activities would inadvertently extend beyond the construction work area and impact these features. Construction-related soil erosion or the inadvertent discharge of toxic construction chemicals could result in significant adverse effects on these off-site features. However, implementation of BMPs in the project's SWPPP would manage soil erosion from the construction work area and protect water quality in these potential wetlands/waters. Therefore, the impact would be less than significant and no mitigation is necessary.

The CEMEX settling ponds are located 50 feet north of the western terminus of the proposed Source Water Pipeline alignment. Indirect impacts on water quality related to soil erosion and potential releases of toxic construction chemicals are not expected as the settling ponds are surrounded by berms and are not located downgradient of the construction work area. Additionally, mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would protect water quality in the ponds and prevent significant impacts on water quality. However, due to proximity of the ponds to the slant well site, potentially significant impacts could result from construction-related activity extending beyond the designated construction work area and into these features.

Implementation of the following mitigation measures would reduce the significant impact on the CEMEX settling ponds to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program),** and **4.6-1c (General Avoidance and Minimization Measures)**. As summarized above in the impact discussion for the subsurface slant wells, these measures would reduce impacts on potentially jurisdictional waters by requiring implementation of protective measures.

Since the Source Water Pipeline and Source Water Pipeline using the optional alignment would have the same potential impacts, the same impacts and mitigation measures would apply to the Source Water Pipeline using the optional alignment as apply to the Source Water Pipeline.

New Desalinated Water Pipeline

The construction footprint for the new Desalinated Water Pipeline is approximately 35.4 acres. A portion of the construction footprint for the new Desalinated Water Pipeline overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, Castroville Pipeline, Castroville Pipeline using the optional alignment 1, and Castroville Pipeline using the optional alignment 2. The new Desalinated Water Pipeline would be located outside of the MBNMS.

Riparian woodland and scrub at Locke-Paddon Park and near the intersection of Marina Green Drive and Del Monte Boulevard are potential waters of the U.S./waters of the state. Pipeline installation activities could temporarily impact 0.42 acre of riparian woodland and scrub. Temporary impacts on these potential waters of the U.S./waters of the state would be significant.

Direct impacts on these features would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program), 4.6-1c (General Avoidance and Minimization Measures),** and **4.6-3 (Avoid, Minimize, and or Mitigate Impacts to Wetlands)**. These measures would reduce impacts on potentially jurisdictional waters by designating a lead biologist to oversee and ensure implementation of jurisdictional waters protective measures; requiring worker training regarding jurisdictional waters potentially present to ensure that workers are aware of jurisdictional waters that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent jurisdictional waters and other measures to avoid and minimize impacts on jurisdictional waters; and requiring the project to be designed to avoid and/or minimize direct impacts on jurisdictional waters to the extent feasible, using HDD or other trenchless methods to install pipeline underneath wetlands or waters (with some exceptions), and compensating for loss of jurisdictional waters.

Indirect impacts could occur from construction-related soil erosion and related effects on water quality. However, mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would avoid significant indirect impacts on water quality and no mitigation measures are required.

Since the new Desalinated Water Pipeline and the new Desalinated Water Pipeline using the optional alignment would have the same potential impacts, the same impacts and mitigation measures would apply to the new Desalinated Water Pipeline using the optional alignment as apply to the new Desalinated Water Pipeline.

Castroville Pipeline

The construction footprint for the Castroville Pipeline is approximately 15.0 acres. A portion of the Castroville Pipeline construction footprint overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, new Desalinated Water Pipeline, and new Desalinated Water Pipeline using the optional alignment. The Castroville Pipeline would be located outside of the MBNMS.

There are a few potentially jurisdictional waters of the U.S./water of the state within the Castroville Pipeline alignment which include the Salinas River, Tembladero Slough, riparian woodland and scrub communities, freshwater marsh communities, and a few culverts and ditches.

Pipeline installation activities could temporarily impact approximately 0.9 acre of riparian woodland and scrub, and additional culverts and ditches. Additionally, a barge would be temporarily used within the Salinas River to install the pipeline on the existing bridge over the river. Temporary impacts on these potential waters of the U.S./waters of the state would be significant.

The pipeline would be installed on the underside of an existing bridge over the Salinas River using a barge and beneath Tembladero Slough using HDD. The Salinas River, Tembladero Slough, and other potentially jurisdictional features are located adjacent to the alignment and the construction area. Mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would protect impacts on water quality in these features from upland erosion. Due to proximity of these features to the construction site, potentially significant impacts could result from construction-related activity extending beyond the designated construction work area and into these features. Additionally, if a frac-out occurs during HDD, bentonite slurry could be released into Tembladero Slough, which could degrade water quality, a significant impact.

Direct impacts on these features would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1q (Frac-out Contingency Plan)**, and **4.6-3 (Avoid, Minimize, and or Mitigate Impacts to Wetlands)**. These measures would reduce impacts on potentially jurisdictional waters by designating a lead biologist to oversee and ensure implementation of jurisdictional waters protective measures; requiring worker training regarding jurisdictional waters potentially present to ensure that workers are aware of jurisdictional waters that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent jurisdictional waters and other measures to avoid and minimize impacts on jurisdictional waters; requiring preparation of a Frac-out Contingency Plan and implementation of measures in the Plan to contain and clean-up any frac-outs in waterways to minimize impacts of frac-outs on special-status species and their habitat; and requiring the project to be designed to avoid and/or minimize direct impacts on jurisdictional waters to the extent feasible, using HDD or other trenchless methods to install pipeline underneath wetlands or waters (with some exceptions), and compensating for loss of jurisdictional waters.

The Castroville Pipeline using the optional alignment 1 would impact approximately 0.9 acre of riparian woodland and scrub, 0.01 acre of freshwater marsh, and additional culverts and ditches. The Castroville Pipeline using the optional alignment 2 would impact approximately 0.9 acre of riparian woodland and scrub and additional culverts and ditches. The Castroville Pipeline using the optional alignments would generally result in the same type of impact as described for the Castroville Pipeline. The same impact conclusion and mitigation measures would apply to the Castroville Pipeline using the optional alignments as apply to the Castroville Pipeline.

Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond

The construction footprint for the Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond combined is approximately 7.4 acres. These facilities would be located outside of the MBNMS.

The Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond would have no direct impacts on waters of the U.S./waters of the state because as described below none are assumed to be located within these component footprints. The CSIP pond is located within the Pipeline to CSIP Pond alignment and is mapped as a freshwater pond by the NWI. The Monterey Regional Water Pollution Control Agency (MRWPCA) operates this concrete-lined, man-made, industrial pond as part of their wastewater treatment and recycled water facilities. For this reason, this EIR/EIS assumes the ponds are not waters of the U.S. or waters of the state. No direct impact on waters of the U.S. or waters of the state would occur from installation of the Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond.

A potentially jurisdictional pond is located approximately 60 feet south of these components. Water quality within this feature could be indirectly impacted from soil erosion and potential releases of toxic construction chemicals. Mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would protect water quality in the pond and prevent significant impacts on water quality. However, due to proximity of the pond to the pipeline alignment, potentially significant impacts could result from construction-related activity extending beyond the designated construction work area and into these features.

Implementation of the following mitigation measures would reduce the significant impact on the pond to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program),** and **4.6-1c (General Avoidance and Minimization Measures)**. As summarized above in the impact discussion for the subsurface slant wells, these measures would reduce impacts on potentially jurisdictional waters by requiring implementation of protective measures.

Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline)

The ASR Facilities include the ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline. These facilities would be located outside of the MBNMS. The construction footprint for both of the ASR Wells is expected to be approximately 0.9 acre. The construction footprint of the area where water would be conveyed is approximately 7.0 acres. The construction footprint for all three ASR pipelines is approximately 8.8 acres. A portion of the construction footprint for the ASR pipelines overlaps with a portion of the construction footprints for the new Transmission Main and the new Transmission Main using the optional alignment.

There are no potential waters of the U.S./waters of the state within the Proposed ASR Facilities project area. Two potential waters of the U.S./waters of the state mapped by the NWI occur over 400 feet from the ASR Pipelines alignment. The project's distance from these features ensures that construction activities would not impact them. Furthermore, mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would avoid adverse impacts on offsite waters of the U.S./waters of the state. Therefore, there are no direct impacts and potential indirect impacts on these potential waters of the U.S./waters of the state would be less than significant and no mitigation is necessary.

Pipelines and Other Conveyance Facilities South of Reservation Road

New Transmission Main

The construction footprint for the new Transmission Main is approximately 27.1 acres. A portion of the new Transmission Main construction footprint overlaps with a portion of the ASR pipelines construction footprint. The new Transmission Main would be located outside of the MBNMS.

There are no potential waters of the U.S./waters of the state within the new Transmission Main alignment. There is one potentially jurisdictional feature located adjacent to the new Transmission Main project area, an ephemeral drainage located south of the 8th Street overpass. Water quality within this feature could be indirectly impacted from soil erosion and potential releases of toxic construction chemicals. Mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would protect water quality in the pond and prevent significant impacts on water quality. However, due to proximity of the drainage to the pipeline alignment, potentially significant impacts could result from construction-related activity extending beyond the designated construction work area and into these features.

Indirect impacts on potential waters of the U.S./waters of the state associated with installation of the new Transmission Main would be significant. However, implementation of **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program),** and

4.6-1c (General Avoidance and Minimization Measures) would reduce these indirect impacts to a less-than-significant level. As summarized above in the impact discussion for the subsurface slant wells, these measures would reduce impacts on potentially jurisdictional waters by requiring implementation of protective measures.

Other potential waters of the U.S./waters of the state mapped by the NWI are located at least 400 feet from the new Transmission Main alignment. The project's distance from these features ensures that construction activities would not impact them. Additionally, mandatory compliance with the NPDES Construction General Permit would avoid significant impacts on the water quality. Therefore, construction of the new Transmission Main would not be expected to impact these offsite potential waters of the U.S./waters of the state.

Since the new Transmission Main and the new Transmission Main using the optional alignment would have the same potential impacts, the same impacts and mitigation measures would apply to the new Transmission Main using the optional alignment as apply to the new Transmission Main.

Carmel Valley Pump Station

The construction footprint for the Carmel Valley Pump Station, including associated pipelines, is approximately 0.2 acre. This facility would be located outside of the MBNMS.

There is a potentially jurisdictional wetland feature mapped by the NWI within the Carmel Valley Pump Station study area. Carmel Valley Pump Station construction activities could temporarily impact 0.005 acre of this feature.

Direct impacts on this potentially jurisdictional feature would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program), 4.6-1c (General Avoidance and Minimization Measures),** and **4.6-3 (Avoid, Minimize, and or Mitigate Impacts to Wetlands)**. As summarized above in the impact discussion for the new Desalinated Water Pipeline, these measures would reduce impacts on potentially jurisdictional waters by requiring implementation of protective measures.

The Carmel River is located approximately 280 feet south of the Carmel Valley Pump Station site. The project's distance from this feature ensures that construction activities would not impact it. Moreover, mandatory compliance with the NPDES Construction General Permit, including implementation of BMPs in the project's SWPPP would avoid impacts on water quality in the River and distance makes it unlikely that construction activities would inadvertently extend into the River. Therefore, indirect impacts on the off-site potential water of the U.S./water of the state would be less than significant and no mitigation is necessary.

Ryan Ranch-Bishop Interconnection Improvements

The construction footprint for the Ryan Ranch-Bishop Interconnection Improvements is approximately 7.3 acres. This facility would be located outside of the MBNMS.

The NWI has mapped a wetland drainage that appears to pass through a culvert underneath Lower Ragsdale Drive near the intersection of Lower Ragsdale Drive and Ryan Court within the Ryan Ranch-Bishop Interconnection Improvements site. This drainage may be considered a water of the U.S./waters of the state. Installation of the Ryan Ranch-Bishop Interconnection Improvements could temporarily impact 0.24 acre of the wetland drainage. Temporary impacts on this potential water of the U.S./water of the state would be significant. Other drainages mapped by the NWI are also located adjacent to the construction area. Mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would protect water quality in these features and prevent significant impacts on water quality.

However, due to proximity of the potentially jurisdictional drainage to the pipeline alignment, potentially significant impacts to the potentially jurisdictional feature could result from construction-related activity extending beyond the designated construction work area and into these features.

Direct impacts on these features would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program), 4.6-1c (General Avoidance and Minimization Measures),** and **4.6-3 (Avoid, Minimize, and or Mitigate Impacts to Wetlands)**. As summarized above in the impact discussion for the new Desalinated Water Pipeline, these measures would reduce impacts on potentially jurisdictional waters by requiring implementation of protective measures.

Main System-Hidden Hills Interconnection Improvements

The construction footprint for the Main System-Hidden Hills Interconnection Improvements is 1.1 acre. This facility would be located outside of the MBNMS.

A wetland drainage, mapped by the NWI, is located approximately 600 feet downslope of the majority of the Main System-Hills Interconnection Improvements site, but appears to run either beneath or adjacent to the Middle Tierra Grande Booster Station. Depending on construction methods, construction activities at the Middle Tierra Grande Booster Station could temporarily directly impact the wetland drainage or indirectly impact the wetland drainage if construction worker foot traffic extends into this feature. Direct or indirect impacts would be a significant impact. Mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would protect water quality in these features and prevent significant impacts on water quality.

Direct impacts on this feature would be further reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program), 4.6-1c (General Avoidance and Minimization Measures),** and **4.6-3 (Avoid, Minimize, and or Mitigate Impacts to Wetlands)**. As summarized above in the impact discussion for the new Desalinated

Water Pipeline, these measures would reduce impacts on potentially jurisdictional waters by requiring implementation of protective measures.

Staging Areas

No potential waters of the U.S./waters of the state occur within any of the eight staging areas located throughout the project area.

Mandatory compliance with the NPDES Construction General Permit, including implementation of BMPs in the project's SWPPP would avoid impacts on any unknown potential waters outside of the boundary of the 8 staging areas. Therefore, use of the 8 staging areas would not result in direct or indirect impacts on waters of the U.S. and/or waters of the state. This impact is less than significant and no mitigation is necessary.

All staging areas would be located outside of the MBNMS.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP construction could be inconsistent with applicable regulatory requirements related to waters of the U.S. and/or waters of the state. Specifically, the project could be inconsistent with the Sections 404 and 401 of the CWA, Section 10 of the Rivers and Harbors Act, the Porter-Cologne Act, the Coastal Act, City of Marina General Plan Policies 4.112, 4.114, 4.116, 4.118, 4.119, 4.121, and 2.10; City of Marina LCLUP Policies 24 and 26 and Planning Guidelines entitled Rare and Endangered Species: Habitat Protection and Wetlands Protection; City of Seaside Local Coastal Program Land Use Plan Policies NCR-CZ 1.1.C, NCR-CZ 1.2.A, NCR-CZ 1.2.B, NCR-CZ 1.3.A, NCR-CZ 1.3.B, LUD-CZ 3.1.A, LUD-CZ 3.1B; Seaside General Plan Policies COS-4.1; Monterey County Carmel Valley Master Plan Policy CV-3.7; Monterey County Greater Monterey Peninsula Area Plan Policy GMP-3.6; and Monterey County General Plan Policies OS-5.16, OS-5.18, OS-5.22, which were established to avoid or mitigate impacts on waters of the U.S. and/or waters of the state. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program), 4.6-1c (General Avoidance and Minimization Measures), 4.6-1q (Frac-out Contingency Plan),** and **4.6-3 (Avoid, Minimize, and or Mitigate Impacts to Wetlands)** would reduce impacts on waters of the U.S. and/or waters of the state by designating a lead biologist to oversee and ensure implementation of jurisdictional waters protective measures; requiring worker training regarding jurisdictional waters potentially present to ensure that workers are aware of jurisdictional waters that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent jurisdictional waters and other measures to avoid and minimize impacts on jurisdictional waters; requiring preparation of a Frac-out Contingency Plan and implementation of measures in the Plan to contain and clean-up any frac-outs in waterways to minimize impacts of frac-outs on special-status species and their habitat; and requiring the project to be designed to avoid and/or minimize direct impacts on jurisdictional waters to the extent feasible, using HDD or other trenchless methods to install pipeline underneath wetlands or waters (with some exceptions), and compensating for loss of jurisdictional waters. Therefore, with these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirements.

Impact Conclusion

Impacts on waters of the U.S./waters of the state are described for each project facility above. Overall, construction of the entire proposed project has the potential to temporarily impact approximately 1.6 acre of federal wetlands, federal other waters, and/or waters of the state.

For all project facilities, mandatory compliance with the NPDES Construction General Permit, including implementation of the project-specific SWPPP, would ensure the construction-related impact on water quality in waters of the U.S./waters of the state related to increased soil erosion and/or inadvertent releases of toxic construction chemicals is less than significant.

Implementation and construction of the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional alignment, new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional alignment, Castroville Pipeline and Castroville Pipeline Optional alignments, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, new Transmission Main and new Transmission Main Optional alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements, have the potential to significantly impact waters of the U.S./waters of the state as a result of placement of fill, removal of a water/wetland feature, and/or the potential for construction activities or construction worker foot traffic to extend beyond the designated construction work area. For these facilities, implementation of the proposed mitigation measures would reduce impacts on waters of the U.S./waters of the state to less than significant.

The impact is less than significant for the MPWSP Desalination Plant, proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), and staging areas.

Overall, the project has potential to impact waters of the U.S./waters of the state. The impact would be less than significant with mitigation.

Mitigation Measures

Mitigation Measure 4.6-1a applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, New Transmission Main and New Transmission Main Optional Alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1b applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, New Transmission Main and New Transmission Main Optional Alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

Mitigation Measure 4.6-1b: Construction Worker Environmental Awareness Training and Education Program.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1c applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, New Transmission Main and New Transmission Main Optional Alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

Mitigation Measure 4.6-1c: General Avoidance and Minimization Measures.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1q applies to HDD installation of the Castroville Pipeline beneath Tembladero Slough.

Mitigation Measure 4.6-1q: Frac-out Contingency Plan

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-3 applies to the New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, New Transmission Main and New Transmission Main Optional Alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvement, and Main System-Hidden Hills Interconnection Improvements.

Mitigation Measure 4.6-3: Avoid, Minimize, and or Mitigate Impacts to Wetlands.

1. A jurisdictional wetland delineation shall be conducted to determine the extent of waters of the U.S. and waters of the state within the project component footprints and anticipated construction disturbance area.

2. The proposed project shall be designed to avoid and/or minimize direct impacts on wetlands and/or waters under the jurisdiction of the U.S. Army Corps of Engineers, Regional Water Quality Control Board, California Department of Fish and Wildlife, and/or the California Coastal Commission to the extent feasible. Horizontal Directional Drilling or other trenchless or above water methods will be used at all pipeline crossings of wetlands and other waters of the U.S. and of the state, except some small order seasonal or ephemeral drainages which do not support riparian woodland, riparian scrub, marsh or other wetland vegetation, and which would be crossed during the dry season in the absence of flow or standing water.

3. Where disturbance to jurisdictional waters cannot be avoided, any temporarily impacted jurisdictional water shall be restored to pre-construction conditions or better at the end of construction. Compensation for permanent impacts shall be provided at a 2:1 or greater ratio. Compensation for loss of jurisdictional waters may be in the form of permanent on-site or off-site creation, restoration, enhancement, or preservation of habitat. At a minimum the restoration or compensation sites shall meet the following performance standards by the fifth year following restoration:

    a. Temporarily impacted areas are returned to pre-project conditions or greater

    b. Wetlands restored or constructed as federal wetlands meet the federal criteria for jurisdictional wetlands and wetlands restored or constructed as state wetlands meet the state criteria for jurisdictional wetlands

    c. No more cover by invasives than the baseline/impact area

    Compensation shall be detailed on a project-specific basis and shall include development of a Wetland Mitigation and Monitoring Plan (WMMP), which shall be developed prior to the start of construction and in coordination with permit applications and/or conditions. At a minimum, the WMMP shall include:

    a. Name and contact information for the property owner of the land on which the mitigation will take place;

    b. Identification of the source for supplemental irrigation;

    c. Identification of depth to groundwater;

    d. Baseline information, including a summary of the findings in any other recent wetland delineations applicable to the project disturbance area;

    e. Anticipated habitat enhancements to be achieved through compensatory actions;

    f. Monitoring methods and schedule;

    g. Performance and success criteria for wetland creation and/or enhancement, with success criteria in tabular form.

    h. Roles and responsibilities for mitigation funding, implementation, maintenance, monitoring, and reporting.

    i. Identification of the mechanism that will preserve the mitigation site in perpetuity, if necessary.

    Alternatively, offsite mitigation credits may be purchased at an approved mitigation bank; if no banks are available, then alternative mitigation may be achieved through payment of in-lieu fees.

Impact 4.6-4: Be inconsistent with any local policies or ordinances protecting biological resources, such as a tree preservation policy or local tree ordinances. (*Significant and Unavoidable*)

Potential inconsistencies with the City of Marina LCLUP and local tree ordinances are described below.

Potential inconsistencies with all other local policies and ordinances protecting biological resources are addressed throughout this section rather than in a stand-alone impact discussion. Potential conflicts were identified in Table 4.6-4, above. In instances where the consistency analysis concluded the project may conflict with a policy or ordinance, the reader is referred to specific impact discussions (Impacts 4.6-1, 4.6-2, 4.6-3, etc.) addressing those specific biological resource issues.

City of Marina LCLUP

Several project facilities would occur in areas that may qualify as primary habitat according to the City of Marina LCLUP. These facilities include the subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, and the staging area located at Beach Road.

The subsurface slant wells would be located in dune vegetation and wildlife habitat that would likely be considered qualify as primary habitat according to the City of Marina LCLUP, and therefore the project would result in impacts on primary habitat. Through design and facility siting, impacts on sensitive biological resources including special-status species and habitat have been minimized. Nonetheless, impacts could result from vegetation removal, grading, excavation, vehicle movements, or construction of the slant wells, and from periodic maintenance of the well heads. These activities have the potential to disturb vegetation, including nesting habitat for western snowy plover, host plants for Smith’s blue butterfly, and sandy substrate for silvery legless lizard. Maintenance activities also could result in exacerbating dune erosion, and hazardous material spills (i.e., fuel, oil, lubricants) in sensitive habitat areas.

Construction and operation of the subsurface slant wells would permanently disturb up to 6 acres of central dune scrub and ice plant mats. The majority of the dune scrub vegetation is currently in a disturbed condition, situated in an inactive sand mining and material handling area that has been retired from use and subject to ice plant control. Typical dominant plant species of intact dune scrub vegetation are largely absent or just beginning to colonize the site, but a sizable population of Monterey spineflower, which often follows disturbance, is present, as are coast buckwheat host plants for Smith’s blue butterfly.

Maintenance of the slant well heads would occur approximately every 5 years, and would require re-disturbance of a portion of the initial construction impact area. This would keep these sites in a permanent state of recovery from disturbance, whereby dune scrub vegetation would not be allowed to mature. Therefore, this would be considered a permanent loss of habitat for the special-status species that have the potential to recolonize the slant well head location if it were restored or allowed to recover naturally.

Similar to the subsurface slant wells, construction of the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, and the staging area located at Beach Road could temporarily impact areas that would likely be considered primary habitat. Impacts on primary habitat, are described in Impact 4.6-2.

Compensation for permanent impacts on sensitive biological resources would occur through implementation of **Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover**, **Mitigation Measures 4.6-1e: Avoidance and Minimization Measures for Special-Status Plants**, **Mitigation Measure 4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly**, and **Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas**, which would describe compensation requirements for western snowy plover, special-status plants, Smith's blue butterfly, sensitive communities, and ESHA, and development and implementation of a Habitat Mitigation and Monitoring Plan described in **Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan**, which describes restoration and preservation of these sensitive biological resources that would occur within the Monterey Bay coastal dune ecosystem.

The Marina LCLUP prohibits development in primary habitat that is not protective of and dependent upon that habitat. The LCLUP states, "Primary habitat areas shall be protected and preserved against any significant disruption of habitat values and only uses dependent on those resources shall be allowed within those areas" (City of Marina, 2013).

Implementation of **Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover**, **Mitigation Measures 4.6-1e: Avoidance and Minimization Measures for Special-Status Plants**, **Mitigation Measure 4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly**, **Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat**, and **Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan** would reduce impacts on special-status species habitat by requiring implementation of appropriate compensation and development and implementation of a mitigation and monitoring plan for temporarily and permanently impacted special-status species habitat to ensure that temporary and permanent losses are fully compensated as required. However, construction and maintenance of the subsurface slant wells, new Desalinated Water Pipeline, new Transmission Main and the staging area located at Beach Road are not uses or developments dependent on the sensitive resources that comprise the primary habitat present. Therefore, these facilities would be inconsistent with the City of Marina LCLUP policies governing protection of primary habitat, a significant and unavoidable impact.

The CCC reached a similar conclusion in its review of the test slant well Coastal Development Permit application, on appeal. The CCC staff report for the test slant well states:

> "Although the project is proposed to be located in portions of the CEMEX site that have been subject to disturbance, the entire area in which the project would be located is primary habitat and ESHA under the LCP. The proposed project is not a resource dependent use, so it cannot be approved consistent with the LCP's habitat protection policies. (CCC, 2014)"

The CCC staff report noted that development of the test slant wells in the proposed location would also conflict with Coastal Act policies related to protection of ESHA (30240).

The CCC was ultimately able to approve the project consistent with the Coastal Act by relying upon Coastal Act Section 30260, which encourages coastal-dependent industrial uses and provides for resolution of conflicting Coastal Act policies where such development is concerned.

Local Tree Ordinances

In general, the types of trees protected by local tree ordinances vary by jurisdiction. **Table 4.6-10**, below, summarizes the local plan, policy, or ordinance that regulates tree removal at each proposed facility site and describes the trees that are protected under the respective plan, policy, or ordinance. The table also includes a description of whether each proposed facility has potential to be inconsistent with a local tree ordinance by removing or impacting a protected tree.

Subsurface Slant Wells

The CEMEX mining area contains relatively undisturbed central dune scrub, formerly disturbed sand dunes that are slowly being occupied by native and non-native dune scrub vegetation, and unvegetated disturbed sandy soil in actively mined areas. There are no trees within the subsurface slant well site. Therefore, no impact would result and no mitigation is necessary.

Staging Areas

There are 8 staging areas located throughout the project area. Some staging areas have trees located along the edge of the staging area boundary; however, no trees would be removed during project implementation. Therefore, no impact would result and no mitigation is necessary.

All Other Proposed Project Facilities and Pipelines

To the extent feasible, all other proposed project facilities would be sited so as to minimize tree removal and avoid impacts on trees. Depending on final siting and design of the proposed project facilities, as well as the construction methods and techniques, implementation of the proposed project could necessitate tree removal at various locations throughout the project area. Any trees removed during project construction may be inconsistent with local tree ordinances. This would be a potentially significant impact.

Implementation of **Mitigation Measure 4.6-4 (Compliance with Local Tree Ordinances),** which summarizes the local tree ordinances and permit requirements that would be implemented if trees were removed, would reduce potential impacts from being inconsistent with local tree ordinances to less than significant by ensuring compliance with local tree ordinances. This measure would reduce impacts on local tree ordinances by requiring conformance with local tree policies and ordinances.

TABLE 4.6-10
APPLICABLE LOCAL PLANS, POLICIES, AND ORDINANCES RELATED TO TREE REMOVAL

Proposed Facility	Jurisdiction	Local Plans, Policies, and Ordinances Related to Tree Removal	Protected Trees	Potential to be Inconsistent with Tree Ordinance
Subsurface Slant Wells	City of Marina	City of Marina Zoning Ordinance and General Plan	A tree removal permit is required to be obtained from the city for any tree that shall be removed or relocated. Oak woodland shall be protected to the greatest extent possible in recognition both of its relatively high biological and aesthetic resource value and its important role in California's and Monterey County's natural heritage. In areas supporting oak woodland, a site survey of this resource should be completed for all new subdivisions and commercial projects as part of a preliminary site and development review. All stands of oak woodland and individual specimens with a diameter of 6 inches or more when measured 4.5 feet from ground level should be identified on a base map. To the greatest extent possible, development plans shall then attempt to incorporate the oak woodland or individual specimens into the plan as an integral feature of the natural and built environment. All oak trees shall be replaced and maintained with new trees of the same stock as those found onsite or in the site vicinity according to the following replacement formula: a minimum one-for-one (one replacement tree for each tree removed) where replacement trees are proposed to be the same diameter or greater than those to be removed; a minimum three-to-one (three replacement trees for each tree removed) for replacement trees of lesser diameter than those proposed for removal, unless, as determined by arborist, the site's specific environmental conditions would not sufficiently support a healthy oak habitat. All diameter measurements shall be taken at 4.5 feet from ground level. Replacement trees shall be a mixture of sizes.	Consistent. There are no trees at the subsurface slant well site.
MPWSP Desalination Plant	Monterey County	Monterey County Zoning Ordinance (Greater Monterey Peninsula Area Plan)	The following trees are protected under this ordinance (tree diameters are measured 2 feet above the ground surface): • oak trees 6 inches or more in diameter in the areas designated as Resource Conservation; Residential; Commercial; Industrial; Industrial, Mineral Extraction; or Agricultural • landmark oak trees (trees 24 inches or more in diameter, trees which are visually significant, historically significant, or exemplary of their species) • any oak tree removed for commercial harvesting purposes The applicant would be required to relocate or replace each removed protected tree on a one-to-one ratio. Additionally, the removal of healthy, native oak, Monterey pine, and redwood trees shall be discouraged.	Potentially Inconsistent. Several trees along Charles Benson Road may require removal to accommodate the proposed access driveways.

TABLE 4.6-10 (Continued)
APPLICABLE LOCAL PLANS, POLICIES, AND ORDINANCES RELATED TO TREE REMOVAL

Proposed Facility	Jurisdiction	Local Plans, Policies, and Ordinances Related to Tree Removal	Protected Trees	Potential to be Inconsistent with Tree Ordinance
MPWSP Desalination Plant (cont.)	Monterey County	Monterey County Code	Oak trees within areas designated as Resource Conservation, Residential, Commercial, or Industrial cannot be removed without the approval of necessary permits. Exceptions include removal of oak trees pursuant to the purpose and standards required in areas designated as Agriculture, Industrial, and or Mineral Extraction. In addition, Title 20, Parts 2-5, addresses native tree removal and protection in the Coastal Zone and Title 21 outside the Coastal Zone. Chapter 16 of the Monterey County Municipal Code also addresses oak and other native tree protection. Native trees in Monterey County, as defined in the ordinance, include Santa Lucia fir, black cottonwood, Fremont cottonwood, box elder, willows, California laurel, sycamores, oaks and madrones. Trees must be at least six inches in diameter two feet above the ground level in order to be subject to these regulations. A landmark oak tree is defined as an oak tree that is 24 inches or more in diameter when measured two feet above ground level or one that is visually significant, historically significant, or exemplary of its species. Removal of any landmark tree is prohibited unless approved by the County Director of Planning and Building Inspection. The applicant would be required to relocate or replace each removed protected tree on a one-to-one ratio.	
Source Water Pipeline and Source Water Pipeline Optional Alignment	City of Marina	City of Marina Zoning Ordinance and General Plan	See above.	<u>Potentially Inconsistent</u>. Although not anticipated, depending on final design, implementation of this pipeline could require tree removal or construction within the driplines of trees at the CEMEX sand mining facility and/or along Charles Benson Road.
	Monterey County	Monterey County Zoning Ordinance (North County Land Use Plan Local Coastal Program)	The following trees are protected under this ordinance (tree diameters are measured 2 feet above the ground surface): ● oak trees 6 inches or more in diameter in the areas designated as Resource Conservation; Residential; Commercial; Industrial; Industrial, Mineral Extraction; or Agricultural ● landmark oak trees (trees 24 inches or more in diameter, trees which are visually significant, historically significant, or exemplary of their species) ● any oak tree removed for commercial harvesting purposes The applicant would be required to relocate or replace each removed protected tree on a one-to-one ratio.	
	Monterey County	Monterey County Zoning Ordinance (Greater Monterey Peninsula Area Plan)	See above.	
	Monterey County	Monterey County Code	See above.	

TABLE 4.6-10 (Continued)
APPLICABLE LOCAL PLANS, POLICIES, AND ORDINANCES RELATED TO TREE REMOVAL

Proposed Facility	Jurisdiction	Local Plans, Policies, and Ordinances Related to Tree Removal	Protected Trees	Potential to be Inconsistent with Tree Ordinance
New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment	City of Marina	City of Marina Zoning Ordinance and General Plan	See above.	Potentially Inconsistent. Although not anticipated, depending on final design, implementation of this pipeline could require tree removal or construction within the driplines of trees along Charles Benson Road or Del Monte Boulevard.
	Monterey County	Monterey County Zoning Ordinance (North County Land Use Plan Local Coastal Program)	See above.	
	Monterey County	Monterey County Zoning Ordinance (Greater Monterey Peninsula Area Plan)	See above.	
	Monterey County	Monterey County Code	See above.	
Castroville Pipeline and Castroville Pipeline Optional Alignments	Monterey County	Monterey County Zoning Ordinance (Greater Monterey Peninsula Area Plan)	See above.	Potentially Inconsistent. Although not anticipated, depending on final design, implementation of this pipeline could require tree removal or construction within the driplines of trees located along Charles Benson Road, the Salinas River, north of Tembladero Slough, and in other isolated locations along the alignment.
	Monterey County	Monterey County Zoning Ordinance (North County Area Plan)	The following trees are protected under this ordinance (tree diameters are measured 2 feet above the ground surface): ● oak or madrone trees 6 inches or more in diameter ● landmark oak trees (trees 24 inches or more in diameter, trees which are visually significant, historically significant, or exemplary of their species) ● any oak tree removed for commercial harvesting purposes The applicant would be required to relocate or replace each removed protected tree on a one-to-one ratio.	
	Monterey County	Monterey County Zoning Ordinance (Greater Salinas Area Plan)	The following trees are protected under this ordinance (tree diameters are measured 2 feet above the ground surface): ● oak trees 6 inches or more in diameter in the areas designated as Resource Conservation; Residential; Commercial; Industrial; Industrial, Mineral Extraction; or Agricultural ● landmark oak trees (trees 24 inches or more in diameter, trees which are visually significant, historically significant, or exemplary of their species) ● any oak tree removed for commercial harvesting purposes The applicant would be required to relocate or replace each removed protected tree on a one-to-one ratio.	
	Monterey County	Monterey County Code	See above.	

TABLE 4.6-10 (Continued)
APPLICABLE LOCAL PLANS, POLICIES, AND ORDINANCES RELATED TO TREE REMOVAL

Proposed Facility	Jurisdiction	Local Plans, Policies, and Ordinances Related to Tree Removal	Protected Trees	Potential to be Inconsistent with Tree Ordinance
Brine Discharge Pipeline and Pipeline to CSIP Pond	Monterey County	Monterey County Zoning Ordinance (Greater Monterey Peninsula Area Plan)	See above.	Potentially Inconsistent. Although not anticipated, depending on final design, implementation of these pipelines could require tree removal or construction within the driplines of trees located along Charles Benson Road and along the MRWPCA Regional WTTP access roads.
	Monterey County	Monterey County Code	See above.	
Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline)	City of Seaside	City of Seaside Municipal Code	A tree permit is required to be obtained from the City for removal or alteration of any tree on private property. The applicant would be required to relocate or replace each removed protected tree on a one-to-one ratio.	Potentially Inconsistent. Although not anticipated, depending on final design, installation of the ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline could require tree removal or construction within the driplines of trees located at these sites.
New Transmission Main and New Transmission Main Optional Alignment	City of Marina	City of Marina Zoning Ordinance and General Plan	See above.	Potentially Inconsistent. Although not anticipated, depending on final design, implementation of this pipeline could require tree removal or construction within the driplines of trees located along Del Monte Boulevard, the TAMC right-of-way, Lightfighter Drive, and General Jim Moore Boulevard.
	City of Seaside	City of Seaside Municipal Code	See above.	
	City of Monterey	City of Monterey Municipal Code	A tree permit is required to be obtained from the City for removal or excessive pruning of any protected tree. Protected trees are defined as a) trees located on a vacant private parcel that are more than two inches (2") in diameter when measured at a point four feet six inches (4'6") above the tree's natural grade; and, b) trees located on a private, developed parcel that are more than six inches (6") when measured at a point four feet six inches (4'6") above the tree's natural grade.	
Carmel Valley Pump Station	Monterey County	Monterey County Zoning Ordinance (Carmel Valley Master Plan)	The following trees are protected under this ordinance (tree diameters are measured 2 feet above the ground surface): ● oak, madrone, or redwood trees 6 inches or more in diameter ● landmark oak trees (trees 24 inches or more in diameter, trees which are visually significant, historically significant, or exemplary of their species)	Potentially Inconsistent. Although not anticipated, depending on final design, installation of the Carmel Valley Pump Station could require tree removal or construction within the driplines of trees located at this site.
Carmel Valley Pump Station (cont.)			● any oak tree removed for commercial harvesting purposes The applicant would be required to relocate or replace each removed protected tree on a one-to-one ratio.	
	Monterey County	Monterey County Code	See above.	

TABLE 4.6-10 (Continued)
APPLICABLE LOCAL PLANS, POLICIES, AND ORDINANCES RELATED TO TREE REMOVAL

Proposed Facility	Jurisdiction	Local Plans, Policies, and Ordinances Related to Tree Removal	Protected Trees	Potential to be Inconsistent with Tree Ordinance
Ryan Ranch–Bishop Interconnection Improvements	City of Monterey	City of Monterey Municipal Code	See above.	Potentially Inconsistent. Although not anticipated, depending on final design, installation of the Ryan Ranch-Bishop Interconnection Improvements could require tree removal or construction within the driplines of trees located at this site.
	Monterey County	Monterey County Zoning Ordinance (Greater Monterey Peninsula Area Plan)	See above.	
	Monterey County	Monterey County Code	See above.	
Main System–Hidden Hills Interconnection Improvements	Monterey County	Monterey County Zoning Ordinance (Carmel Valley Master Plan)	See above.	Potentially Inconsistent. Although not anticipated, depending on final design, installation of the Main System-Hidden Hills Interconnection Improvements could require tree removal or construction within the driplines of trees located at this site.
	Monterey County	Monterey County Code	See above.	

Consistency with Regulatory Requirements

In addition to the impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP construction could be inconsistent with applicable regulatory requirements related to the City of Marina LCLUP policy protecting primary and secondary habitat and trees.

With respect to the City of Marina LCLUP policy protecting primary and secondary habitat, the project would be inconsistent with the City of Marina LCLUP Policy 25, "Rare and Endangered Species: Habitat Protection." Implementation of **Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover**, **Mitigation Measures 4.6-1e: Avoidance and Minimization Measures for Special-Status Plants**, **Mitigation Measure 4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly**, **Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat**, and **Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan** would reduce impacts on special-status species habitat by requiring implementation of appropriate compensation and development and implementation of a mitigation and monitoring plan for temporarily and permanently impacted special-status species habitat to ensure that temporary and permanent losses are fully compensated as required. However, given that project facilities proposed for such habitats are not resource-dependent, and because the LCLUP policy provides no exception to the requirement that developments within such habitats be resource-dependent, potential conflicts with this policy would remain unresolved. The effect would be would be significant and unavoidable.

Regarding tree protection requirements, the project could be inconsistent with City of Marina General Plan Policy 4.120, City of Marina Municipal Code Chapter 17.51, Monterey City Code Chapter 37, Seaside Municipal Code Chapter 8.54, Carmel Valley Master Plan Policy CV-3.11, Monterey County Greater Monterey Peninsula Area Plan Policy GMP-3.5, Monterey County Code Section 21.64.260, Monterey County General Plan Policy OS-5.11, and Monterey County North County Area Plan Policy NC-3.4, which were established to avoid or mitigate impacts on trees. As discussed in the preceding paragraphs, **Mitigation Measure 4.6-4 (Compliance with Local Tree Ordinances),** which summarizes the local tree ordinances and permit requirements that would be implemented if trees were removed, would reduce potential impacts related to conflicts with local tree ordinances to less than significant. This measure would reduce impacts on local tree ordinances by requiring conformance with local tree policies and ordinances. Therefore, with these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirements.

Impact Conclusion

Implementation and construction of the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional alignment, and potentially the new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional alignment, new Transmission Main and new Transmission Main Optional alignment, and the staging area located at Beach Road would be inconsistent with the City of Marina LCLUP and impacts would be significant and unavoidable.

Implementation and construction of the MPWSP Desalination Plant, Castroville Pipeline and Castroville Pipeline Optional alignments, Brine Discharge Pipeline and Pipeline to CSIP Pond, proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements have the potential to be inconsistent with local tree ordinances. For these facilities, implementation of the proposed mitigation measures would reduce potential impacts from being inconsistent with local tree ordinances to less than significant.

Use of the remaining staging areas would be consistent with local tree ordinances. There would be no impact from these facilities and no mitigation is necessary.

Overall, the project would be inconsistent with local policies or ordinances protecting biological resources. The impact would be significant and unavoidable.

Mitigation Measures

Mitigation Measure 4.6-1d applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional alignment.

Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover

(See Impact 4.6-1, above, for description)

Mitigation Measure 4.6-1e applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional alignment, new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional alignment, new Transmission Main and new Transmission Main Optional alignment, and Staging Areas.

Mitigation Measures 4.6-1e: Avoidance and Minimization Measures for Special-Status Plants

(See Impact 4.6-1, above, for description)

Mitigation Measure 4.6-1f applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional alignment, new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional alignment, new Transmission Main and new Transmission Main Optional alignment, and Staging Areas.

Mitigation Measure 4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly

(See Impact 4.6-1, above, for description)

Mitigation Measure 4.6-2b applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional alignment, new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional alignment, new Transmission Main and new Transmission Main Optional alignment, and Staging Areas.

Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat

(See Impact 4.6-2, above, for description)

Mitigation Measure 4.6-1n applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional alignment, new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional alignment, new Transmission Main and new Transmission Main Optional alignment, and Staging Areas.

Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan

(See Impact 4.6-1, above, for description)

Mitigation Measure 4.6-4 applies to the MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Brine Discharge Pipeline and Pipeline to CSIP Pond, New Transmission Main and New Transmission Main Optional Alignment, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

Mitigation Measure 4.6-4: Compliance with Local Tree Ordinances.

1. The project applicant shall perform a comprehensive survey within the project footprint to identify, measure, and map trees subject to local tree removal ordinances (as specified in Table 4.6-10) at least 30 days prior to start of planned ground disturbance or tree removal.

2. Any trees that are subject to local tree removal ordinances shall be avoided to the extent practicable.

3. If tree removal cannot be avoided by project construction, then the applicant shall comply with the applicable local tree policies or ordinances, obtain appropriate tree removal permits from applicable local agencies, and comply with those permits.

4. Tree removal, preservation, or mitigation on Army property would be done in accordance with the Integrated Natural Resource Management Plan Presidio of Monterey and Ord Military Community (November, 2008).

Impact 4.6-5: Introduce or spread an invasive non-native species during construction. (*Less than Significant with Mitigation*)

Project construction activities could contribute to the spread of invasive plants and/or introduce new invasive plants to the project area or adjacent lands with native plant communities through earth moving, transport of vehicles, equipment and materials, and unanticipated sediment dispersal during rain events, which would be a significant impact. Invasive species include those species that are rated by the California Invasive Plant Council as a ‘high’ or ‘moderate’ invasive species.[29]

[29] The California Invasive Plant Council defines high and moderate invasive species as follows (Cal-IPC, 2016):
High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, through establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Construction activities at the following facilities have potential to spread or introduce invasive species to native plant communities in or adjacent to the project area: subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional alignment, new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional alignment, Castroville Pipeline and Castroville Pipeline Optional alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), and new Transmission Main and new Transmission Main Optional alignment. These facilities are either located within or are adjacent to native plant communities. Introducing or spreading invasive species to native plant communities is a significant impact. Implementation of **Mitigation Measure 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)** and **4.6-1p (Control Measures for Spread of Invasive Plants)** would reduce impacts to less than significant by designating a lead biologist to oversee and ensure implementation of special-status species and sensitive natural community protective measures and requiring implementation of measures, such as cleaning tools and equipment, to reduce the introduction or spread of invasive species.

Construction activities at the following facilities would not be expected to spread or introduce invasive species: Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas. The project areas for these facilities are either developed or largely surrounded by developed areas. Therefore, there would be no impact from the introduction or spread of the invasive species at these facilities and no mitigation is necessary.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP construction could be inconsistent with applicable regulatory requirements related to the introduction or spread of invasive species. Specifically, the project could be inconsistent with Executive Order 13112, which was established to avoid or mitigate impacts from the introduction or spread of invasive species. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)** and **4.6-1p (Control Measures for Spread of Invasive Plants)** would reduce impacts from the introduction or spread of invasive species by designating a lead biologist to oversee and ensure implementation of special-status species and sensitive natural community protective measures and requiring implementation of measures, such as cleaning tools and equipment, to reduce the introduction or spread of invasive species. Therefore, with these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirement.

Impact Conclusion

Implementation and construction of the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional alignment, new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional alignment, Castroville Pipeline and Castroville Pipeline Optional alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), and new Transmission Main and new Transmission Main Optional alignment has the potential to introduce or spread invasive species. For these facilities, implementation of the proposed mitigation measures would reduce potential impacts from introducing or spreading invasive species to less than significant.

Implementation and construction of the Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas would not introduce or spread invasive species. There would be no impact from these facilities and no mitigation is necessary.

Overall, the project has potential to introduce or spread invasive species, which would be a significant impact. The impact would be less than significant with mitigation.

Mitigation Measures

Mitigation Measure 4.6-1a applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), and New Transmission Main and New Transmission Main Optional Alignment.

Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures

(See Impact 4.6-1, above, for description)

Mitigation Measure 4.6-1p applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), and New Transmission Main and New Transmission Main Optional Alignment.

Mitigation Measure 4.6-1p: Control Measures for Spread of Invasive Plants

(See Impact 4.6-1, above, for description)

4.6.5.2 Operational and Facility Siting Impacts

With the exception of the MPWSP Desalination Plant, which would be staffed 24 hours a day, 365 days a year, all other proposed project facilities would be operated remotely via Supervisory Control and Data Acquisition (SCADA) and would not be regularly manned. Approximately every 5 years, periodic maintenance of the subsurface slant wells would require use of heavy construction equipment and would result in substantial ground disturbance in the CEMEX active mining area. CalAm facility operators would conduct routine inspections and maintenance of all aboveground facilities but none of the other facilities would result in ground disturbance during routine operations.

It is assumed that CalAm maintenance staff would make pipelines repairs when needed. Because the location, nature, and extent of disturbance associated with future pipeline repairs cannot be predicted, it would be too speculative to analyze the potential site-specific adverse effects associated with future pipeline repairs at this time. However, certain pipeline repairs may be subject to future CEQA/NEPA review. For these reasons, only known, reasonably foreseeable, operational impacts are evaluated below.

Impact 4.6-6: Result in a substantial adverse effect on candidate, sensitive, or special-status species during project operations. (*Less than Significant with Mitigation*)

As described in Impact 4.6-1 and shown in **Table 4.6-2**, above, many special-status plants and animals are either known to occur, or have the potential to occur at the proposed facility sites. Operation of some project facilities would generate noise and increase ambient noise levels in the vicinity of the facility site. In addition, some of the aboveground facilities would include nighttime lighting. Depending on the existing conditions at the facility sites, operational noise and/or nighttime lighting could disturb migrating birds and other special-status wildlife species in the vicinity. These effects are described below. Routine site visits by CalAm facility operators to conduct inspections and monitor facility operations are not expected to generate substantial noise or result in adverse effects on special-status plants and wildlife.

Subsurface Slant Wells

CalAm facility operators would access the slant well sites using the existing CEMEX access road and the improved access road that would run north-south from Site 6 to the CEMEX access road (see **Figure 3-3a**). There is no proposed night lighting at this facility.

The slant wells would require periodic maintenance approximately every 5 years. During periodic maintenance, mechanical brushes would be lowered into the wells to mechanically clean the screens and, if needed, environmentally inert chemical cleaning products would be used. Periodic maintenance of the slant wells would result in approximately 6 acres of ground disturbance in the CEMEX active mining area. Maintenance of the 10 slant wells would occur over a period of 9 to 18 weeks every 5 years. Maintenance would be conducted between October and February to avoid the western snowy plover nesting season.

Several special-status species, as listed in **Table 4.6-2** and discussed in Impact 4.6-1, have potential to occur within central dune scrub in the immediate vicinity of the subsurface slant wells. These include Monterey spineflower, western snowy plover, Smith's blue butterfly, globose dune beetle, black legless lizard, and silvery legless lizard.

Additionally, western snowy plovers are known to breed and winter in this area and have potential to occur within the slant well site. As mentioned above, periodic maintenance would occur between October and February and outside of the western snowy plover breeding season (breeding season is typically between March and September), so this maintenance would have no impact on breeding western snowy plover individuals. The disturbance area is located in and around the wellheads. Although western snowy plovers have not been recently documented breeding in the back dune area, nests have been historically observed in the back dunes, and this area continues to provide potential breeding habitat for this species. Continual disturbance of this 6-acre area every 5 years may preclude plovers from nesting in this location in the future. Therefore, this would be a permanent loss of up to 6 acres of western snowy plover habitat, which includes a mix of relatively undisturbed central dune scrub, formerly disturbed sand dunes that are revegetating with native and non-native dune scrub vegetation, and unvegetated disturbed sandy soil in actively mined areas, which would be a significant impact. This 6-acre maintenance area would overlap with the 8-acre temporary disturbance area described in Impact 4.6-1. Therefore, the project (including both construction and maintenance) would result in a net permanent impact on 7 acres and temporary impact on 2 acres of western snowy plover habitat.

Maintenance activities would largely occur within the backdunes, away from the beach and foredunes where flocks of plovers are typically found in this season. However, wintering plovers could occur throughout the maintenance area and noise or disturbance from maintenance activities could directly or indirectly impact wintering plovers, in the manner described in *Overview of Potential Construction Effects on Wildlife* in Impact 4.6-1, a potentially significant impact. Maintenance work may also displace wintering birds that may utilize the beach or back dunes. Abundant wintering habitat is available elsewhere along the Monterey Bay shoreline to support any wintering western snowy plovers displaced during maintenance, since they are not reliant on a stationary location, such as a nest, during winter. Permanent impacts to plover habitat were addressed in the previous paragraph.

Steelhead have potential to occur in the Salinas River and Tembladero Slough. As described in Impact 4.4-3 in Section 4.4.5.2, slant well pumping would not directly pull surface water from the Salinas River, but it could draw in groundwater that would otherwise discharge to the river. The proposed project would remove approximately 400 afy of groundwater from the river recharge system. The annual volume of water flowing through the Salinas River to the ocean in 2012 was approximately 250,000 afy. Therefore, the 400 afy reduction would be approximately 0.16 percent of the total flow volume, a minor reduction in surface water supply. This same conclusion applies to Tembladero Slough where the removal of approximately 65 afy of groundwater discharge would constitute a minor reduction in surface water supply. Since project operations would not result in a substantial reduction in surface water supply in the Salinas River or Tembladero Slough, operations would not result in a substantial impact on steelhead or their habitat. Therefore, impacts on steelhead would be less than significant.

Coast buckwheat, host plant for Smith's blue butterfly, occurs within the proposed subsurface slant wells site (ESA, 2013; 2014). Removal of or impacts on these plants and associated soil during maintenance could impact individual adult butterflies, their eggs, or larvae, if present. Impacts to any life form of the Smith's blue butterfly would result in a significant impact. Additionally, maintenance activities have potential to impact up to approximately 1.6 acre of Smith's blue butterfly habitat. Since maintenance activities would disturb these areas every

5 years, it is considered a permanent loss of habitat, which would be a significant impact. This 1.6-acre impact area would overlap with the 1.6-acre temporary disturbance area described in Impact 4.6-1. Therefore, the project (including both construction and maintenance) would result in a net permanent impact on 1.6 acre of Smith's blue butterfly habitat.

Monterey spineflower, black legless lizard, silvery legless lizard, and other special-status species listed under subsurface slant wells in **Table 4.6-6** could be directly or indirectly impacted during maintenance of the subsurface slant wells during the 9- to 18-week construction period every 5 years in a similar manner to the impacts described under the headings *Overview of Potential Construction Effects on Plants* and *Overview of Potential Construction Effects on Wildlife* in Impact 4.6-1. These impacts would be potentially significant.

Globose dune beetle has potential to occur within central dune scrub at the slant well site. If present, maintenance activities could degrade habitat for this species, which would be a significant impact.

Impacts from subsurface slant well maintenance on central dune scrub, which is habitat for globose dune beetle, black legless lizard, silvery legless lizard, and coast horned lizard, are addressed below under Impact 4.6-7.

Implementation of the following mitigation measures would ensure that impacts on sensitive species at this site are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1d (Protective Measures for Western Snowy Plover), 4.6-1e (Avoidance and Minimization Measures for Special-status Plants), 4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly), 4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard), 4.6-1i (Avoidance and Minimization Measures for Nesting Birds), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.12-1b (General Noise Controls for Construction Equipment)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures).** These measures would reduce impacts on special-status species from maintenance of the subsurface slant wells as described for the subsurface slant wells in impact 4.6-1.

Operation of the well pumps in the subsurface slant wells would generate noise. As stated in Section 4.12, Noise and Vibration, noise from pump operations would attenuate as it passes through both soil and the subsurface concrete casing. Simultaneous operation of 10 well pumps would conservatively generate a noise level of approximately 66 dBA at 50 feet. At 150 feet, this noise level would be no greater than the ambient noise generated by breaking waves (57 dBA). Since ambient noise levels at the CEMEX active mining area include noise generated from heavy machinery and mining vehicles associated with the CEMEX operations (85 dBA at 50 feet), crashing waves at the Pacific Ocean (57 dBA at 300 feet), and vehicle traffic along Highway 1, the 66 dBA attenuated noise level from pump operations would be less than the combination of these existing sources. Since the attenuated noise from the pumps would not exceed ambient noise levels, the pumps would not be expected to impact migratory birds or other special-status wildlife at the site. Impacts would be less than significant.

As described in Section 4.12.14, Evaluation Criteria in Section 4.12, Noise and Vibration, operation of the proposed project would not involve equipment that would produce ground borne vibration. Since operation of the well pumps would not produce ground borne vibration, there would be no impact on western snowy plover from such vibration.

MPWSP Desalination Plant

The 3-million-gallon brine storage basin at the MPWSP Desalination Plant would be approximately 1.5 acres in extent. Research on impacts of hypersaline waterbodies on birds indicates that waterfowl using large highly saline lakes or ponds can become sick or die, particularly if there is not a source of fresh water in the vicinity. These waterbodies varied in size between 140 to approximately 3,200 acres in size (Gordus et al., 2002; Windingstand et al., 1987; USGS, 2004).

In 1985, approximately 150 waterfowl died and 250 were sickened from salt poisoning in White Lake, an approximately 3,200-acre waterbody (Windingstand et al., 1987). Sodium concentrations at that time were over 17,000 mg/l. In 1998 and 1999, approximately 200 dead and sick ruddy ducks were collected from an approximately 140-acre agricultural evaporation basin located in the San Joaquin Valley. Sodium concentrations were approximately 39,000 mg/l in the basin that year (Gordus et al., 2002).

The salinity of the brine in the MPWSP brine storage basis is expected to range between 57 and 58 parts per thousand (ppt; Flow Science, Inc., 2014). Waterfowl using the brine storage basin over long periods of time could become sick or die from salt toxicosis. The brine storage basin would be much smaller in size compared to the large hypersaline ponds described above and it is unlikely that the brine storage basin would impact the same number of birds as the ponds described above. Additionally, the freshwater pond located within Locke-Paddon Park, approximately 2 miles south of the proposed brine storage basin, is similar in size to the proposed basin and would provide a freshwater alternative to the basin. Although it is unlikely that many birds would become sick or die at the brine storage basin annually, over the life of the project, some migratory waterfowl could become sick or die from use of the brine storage basin, a significant impact.

Implementation of **Mitigation Measure 4.6-6 (Installation and Monitoring of Bird Deterrents at the Brine Storage Basin)** would reduce potential impacts on migratory waterfowl by discouraging them from using the basin. Bird deterrent measures (such as use of a falconer, bird whistles, and fine ropes placed over the pond) are used at the adjacent MRWPCA Regional Wastewater Treatment Plant to successfully deter most birds from their ponds (Holden, 2015).

The MPWSP Desalination Plant would use lighting for safety and security. Lighting would be similar to the existing light sources in the vicinity and would not change existing night lighting conditions or impact special-status wildlife in the vicinity. Pumps for the RO system would be located within the treatment building and would not generate substantial noise. Some noise would be generated from the emergency diesel-powered generator for approximately 20 to 30 minutes each week. As stated in Section 4.12, Noise and Vibration, generators of the size proposed typically generate a noise level of 81 dBA L_{max} at 50 feet, similar to that of a diesel truck. Given the existing volume of diesel truck pass-by events on Charles Benson Road currently occurring from operations of the adjacent Monterey County Landfill, relatively infrequent noise from the generator, coupled with the sites proximity to an existing landfill and water treatment facility, would not significantly impact special-status wildlife in the vicinity. Lighting and noise impacts on special-status wildlife would be less than significant.

ASR-5 and ASR-6 Wells

Nighttime lighting may need to be installed at the ASR-5 and ASR-6 Wells for site safety and security. Lighting would be similar to existing light sources adjacent to the site (from the adjacent street lights, the golf course on the opposite side of General Jim Moore Boulevard, and adjacent residences) and would not significantly add to existing light sources or impact special-status wildlife in the vicinity of this site. Lighting impacts would be less than significant.

Each of the ASR-5 and ASR-6 Wells would be equipped with a pump that would be enclosed in a standard concrete pump house to attenuate pump noise. As stated in Section 4.12, Noise and Vibration, placing the motors in a standard concrete pump house would result in a resultant noise level of 57.5 dBA L_{max} at 50 feet. Ambient noise levels at the ASR-5 and ASR-6 Well sites (52 dBA) are the result of recreational activities at the golf course and vehicle traffic along General Jim Moore Boulevard. Substantial increases in the ambient noise level could adversely affect special-status wildlife within 50 feet of the ASR-5 and ASR-6 Well sites, a potentially significant impact. As described in Impact 4.12-5 in Section 4.12.6.2, implementation of **Mitigation Measure 4.12-5 (Stationary Source Noise Controls)** would ensure that noise levels are maintained no greater than 5 dBA above existing monitored ambient values. This would ensure that the pumps would not substantially increase noise levels and would not significantly impact special-status wildlife in the vicinity of the site. Noise impacts on special-status wildlife would be less than significant with mitigation.

Brine Mixing Box

There would be two above-ground components associated with the Brine Mixing Box: a laboratory and a control building. The Brine Mixing Box would be operated remotely via SCADA. Trucks would occasionally bring brine samples to the laboratory. Night lighting would not be used at these facilities and noise from operations and use of the laboratory is not expected to exceed ambient noise levels. Therefore, operation of the Brine Mixing Box would not impact special-status species.

Carmel Valley Pump Station

Minimal nighttime lighting would be used at the Carmel Valley Pump Station for security. As the Carmel Valley Pump Station is located in the vicinity of the Carmel River riparian corridor, which provides habitat for migratory birds and bats, the new lighting would introduce a new source of substantial light to the area that could impact migratory birds or bats by causing them to abandon their nests or roosts, which is a significant impact. However, with implementation of **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)**, the impact would be reduced to a less-than-significant level. The measure would reduce nighttime light and glare impacts on special-status wildlife species by requiring use of low-intensity lighting and that light be shielded or directed downward to prevent light spillage into adjoining areas where special-status wildlife species may occur.

Although CalAm would operate the Carmel Valley Pump Station via SCADA, CalAm facility operators would make routine visits to inspect the facilities and monitor operations. Routine visits would not generate substantial noise levels.

Operational pump noise could increase ambient noise levels in the immediate vicinity of the concrete pump houses. The Carmel Valley Pump Station is bordered by Carmel Valley Road to the north, the Carmel River and associated riparian corridor to the south, and residences to the east and west, and the existing ambient noise level at the site is 61.5 dBA. As stated in Section 4.12, Noise and Vibration, placing the pumps in an enclosed building would result in a resultant noise level of 62.6 dBA L_{eq} at 50 feet. Operation of the pump would not generate noise substantially above ambient levels. Therefore, noise impacts on special-status wildlife species would be less than significant.

Main System-Hidden Hills Interconnection Improvements

There would be no changes to the nighttime lighting at the Upper Tierra Grande Booster Station and Middle Tierra Grande Booster Station.

Upgraded pumps would replace existing pumps at the Upper Tierra Grande Booster Station and the Middle Tierra Grande Booster Station. Although the new replacement pumps would generate more noise than the existing pumps, they would still be located within existing buildings that would attenuate noise. Both pumps would be located alongside existing roadways and within existing residential developments. As stated in Section 4.12, Noise and Vibration, placing the pumps in the building enclosure would result in resultant noise levels of 61.1 dBA L_{eq} at 50 feet and 55.4 dBA L_{eq} at 50 feet at the Upper Tierra Grande Booster Station and Middle Tierra Grande Booster Station, respectively. Ambient noise levels at the site (44.7 dBA) are the result of existing residential activities at the site. Noise from these upgraded pumps would substantially increase noise levels. Substantial increases in the ambient noise level could adversely affect special-status wildlife within 50 feet of the booster stations. As described in Impact 4.12-5 in Section 4.12.6.2, implementation of **Mitigation Measure 4.12-5 (Stationary Source Noise Controls)** would ensure that noise levels are maintained no greater than 5 dBA above existing monitored ambient values. This would ensure that the pumps would not substantially increase noise levels and would not significantly impact special-status wildlife in the vicinity of the site. Noise impacts on special-status wildlife would be less than significant with mitigation.

All Pipelines

Operation of the Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, and Ryan Ranch-Bishop Interconnection Improvements would not generate noise because these pipelines and pipeline connections would be located underground and would not include pumps or any other noise-generating facilities. Pipeline operations would have no impact on special-status species. No mitigation is required.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP operations could be inconsistent with applicable regulatory requirements related to special-status species that were adopted for the purpose of avoiding or mitigating an environmental effect. Specifically, the project could be inconsistent with the FESA, Federal Migratory Bird Treaty Act, CESA, California Fish and Game Code, City of Marina General Plan Policies 4.112, 4.114, 4.118, 4.119, and 2.10; City of Marina Local Coastal Land Use Plan Policies 25 and 26 and Planning Guideline entitled Rare and Endangered Species: Habitat Protection, which were established to avoid or mitigate special-status species impacts, respectively. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1d (Protective Measures for Western Snowy Plover), 4.6-1e (Avoidance and Minimization Measures for Special-status Plants), 4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly), 4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard), 4.6-1i (Avoidance and Minimization Measures for Nesting Birds), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **Mitigation Measure 4.6-6 (Installation and Monitoring of Bird Deterrents at the Brine Storage Basin), 4.12-1b (General Noise Controls for Construction Equipment)**, **Mitigation Measure 4.12-5 (Stationary Source Noise Controls)**, and **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)** would reduce impacts on special-status species from MPWSP operations by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid, minimize, and compensate for impacts on the western snowy plover such as avoiding the breeding season, installing a visual construction barrier for work conducted adjacent to breeding habitat during the breeding season to reduce human disturbance to plovers, conducting pre-construction surveys to determine if plovers are present and implementing minimization measures to minimize construction impacts on plovers, if present, and compensating for habitat loss to mitigate for temporary and permanent loss of habitat; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on Smith's blue butterfly such as avoiding host plants to the extent feasible to avoid impacts to individuals, relocating host plants, duff, and/or soil that cannot be avoided, and providing compensatory mitigation for permanent impacts; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests and requiring a no-disturbance buffer around active nests if work is scheduled during the nesting season; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species such as cleaning tools and equipment before entering and leaving worksites, avoiding driving or operating equipment in weed-infested areas, and covering non-active stockpiles; discouraging migratory waterfowl from using the Brine Storage Basin; requiring implementation of noise controls for construction equipment to reduce noise impacts on special-status wildlife species; ensuring that noise levels are maintained no greater than 5 dBA above existing monitored ambient values to reduce noise impacts on special-status wildlife species; and requiring use of low-intensity lighting and that light be shielded or directed downward to prevent light spillage into adjoining areas where special-status wildlife species may occur.

Therefore, with these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirements.

Impact Conclusion

Periodic maintenance of the subsurface slant wells and regular operation of the MPWSP Desalination Plant and Carmel Valley Pump Station have the potential to impact special-status species. Implementation of the proposed mitigation measures would reduce impacts on special-status species to less than significant.

Operations and maintenance of the ASR-5 and ASR-6 Wells and Main System-Hidden Hills Interconnection Improvements would have less-than-significant impacts on special-status species. No mitigation is required.

Operations and maintenance of the Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, and Ryan Ranch-Bishop Interconnection Improvements, would not impact special-status species. Therefore, no impact would result and no mitigation is required.

Mitigation Measures

Mitigation Measure 4.6-1a applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1b applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1b: Construction Worker Environmental Awareness Training and Education Program.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1c applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1c: General Avoidance and Minimization Measures.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1d applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1e applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1e: Avoidance and Minimization Measures for Special-status Plants.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1f applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1g applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1g: Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1i applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1i: Avoidance and Minimization Measures for Nesting Birds.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1n applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1p applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1p: Control Measures for Spread of Invasive Plants

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-6 applies only to the MPWSP Desalination Plant.

Mitigation Measure 4.6-6: Installation and Monitoring of Bird Deterrents at the Brine Storage Basin.

Bird deterrents (such as reflective flagging, whistles, or a falconer) shall be utilized at the Brine Storage Basin. The type of bird deterrent shall be determined by the lead biologist and shall be modified if, through monitoring (as described below), the bird deterrents are either not sufficient at deterring birds from the Brine Storage Basin or pose a risk to wildlife.

Monitoring of the Brine Storage Basin shall include the following:

- ***Daily Monitoring:*** CalAm operational staff will monitor the brine pond on a daily basis as part of their regular routine. If staff see regular use of the pond by birds, any dead animals, or any unusual siting, USFWS will be notified within one working day.
- ***Monthly Monitoring*****:** A qualified biologist and/or qualified biological monitor shall regularly survey the Brine Storage Basin at least once per month starting with the first month of operation of the Brine Storage Basin. The purpose of the surveys shall be to determine if the bird deterrents are effective in excluding birds and to assess whether the deterrents serve as a hazard to birds or wildlife. The monthly surveys shall be conducted in one day for a minimum of two hours following sunrise (i.e., dawn), a minimum of one hour mid-day (i.e., 1100 to 1300), and a minimum of two hours preceding sunset (i.e., dusk) in order to provide an accurate assessment of bird and wildlife use of the ponds during all seasons. Operations staff at the MPWSP Desalination Plant shall also report finding any dead birds or other wildlife at the Brine Storage Basin to the Lead Biologist within one day of the detection of the carcass. The Lead Biologists shall report any bird or other wildlife deaths or entanglements within two days of the discovery to CalAm, CDFW, and USFWS.
- ***Quarterly Monitoring*****:** If after 12 consecutive monthly site visits (described above) no bird or wildlife deaths are detected at the Brine Storage Basin by or reported to the Lead Biologist, monitoring can be reduced to quarterly visits.
- ***Biannual Monitoring*****:** If after 12 consecutive quarterly site visits (described above) no bird or wildlife deaths are detected by or reported to the Lead Biologist, future surveys may be reduced to two surveys per year, during the spring nesting season and during fall migration.
- ***Modification of Monitoring Program*****:** The Lead Biologist shall modify the monitoring program based on information acquired during monitoring if any changes are needed, and determine adaptive management measures to remedy any problems that are detected during monitoring or modifications if bird impacts are observed.

Mitigation Measure 4.12-1b applies to the subsurface slant wells.

Mitigation Measure 4.12-1b: General Noise Controls for Construction Equipment.

(See Impact 4.12-1 in Section 4.12, Noise and Vibration, for description.)

Mitigation Measure 4.15-5 applies to ASR-5 and ASR-6 Wells and Main System-Hidden Hills Interconnection Improvements

Mitigation Measure 4.12-5: Stationary-Source Noise Controls.

(See Impact 4.12-5 in Section 4.12, Noise and Vibration, for description.)

Mitigation Measure 4.14-2 applies to the subsurface slant wells and Carmel Valley Pump Station.

Mitigation Measure 4.14-2: Site-Specific Nighttime Lighting Measures.

(See Impact 4.14-2 in Section 4.14, Aesthetic Resources, for description.)

Impact 4.6-7: Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during project operations. (*Less than Significant with Mitigation*)

As described above under Impact 4.6-2, the following sensitive natural communities occur within or in the vicinity of the project area: central dune scrub, central maritime chaparral, northern coastal scrub, riparian woodland and scrub, freshwater marsh, and coast live oak woodland. Critical habitat is also considered a sensitive natural community for the purposes of this analysis. ESHA, as defined by the CCC and in local coastal plans, and primary habitat, as defined by the City of Marina's LCLUP occurs within the project area. (Potential operational impacts on wetlands or other waters, which are also considered sensitive natural communities, are addressed below under Impact 4.6-8.)

Project operations would largely be confined to water transport within the new facilities and would not result in any new ground disturbance. Maintenance activities at the subsurface slant wells would include periodic ground disturbance, which may result in impacts on sensitive natural communities. Foreseeable maintenance activities at the remaining proposed facilities would not result in any new ground disturbance and would not result in impacts on sensitive natural communities.

Subsurface Slant Wells

Maintenance of the slant wells would be required approximately every 5 years and would disturb a total of up to 6 acres of central dune scrub and areas that are currently actively disturbed for sand mining activities. This disturbance area includes relatively undisturbed central dune scrub, formerly disturbed sand dunes that are revegetating with native and non-native dune scrub vegetation, and unvegetated disturbed sandy soil areas. The total duration for maintenance activities would be 9 to 18 weeks every 5 years. Disturbance every 5 years would keep these sites in a permanent state of recovery from disturbance and dune scrub vegetation would not be allowed to mature. Therefore, this maintenance is considered a permanent impact. As stated above under Impact 4.6-2, the site is in the coastal zone and the entire maintenance area would likely be considered primary habitat under the City of Marina LCLUP and ESHA by the CCC. Impacts to central dune scrub and primary habitat/ESHA would be potentially significant. The

6-acre maintenance area would overlap with the 8-acre temporary disturbance area described in Impact 4.6-2. Therefore, both construction and maintenance of the subsurface slant wells would result in a net permanent impact on 7 acres and temporary impact on 2 acres of central dune scrub/primary habitat/ESHA.

Additionally, as described under Impact 4.6-2, western snowy plover critical habitat is located approximately 240 feet west of well Site 1. Slant well maintenance at well Site 1 could indirectly impact this critical habitat if worker foot traffic extends beyond the designated construction work area, if trash and debris is left behind following construction, and/or if invasive plant species are introduced or spread at the site. Indirect impacts on critical habitat would be significant.

Implementation of the following mitigation measures would ensure that maintenance impacts on sensitive natural communities, including critical habitat for western snowy plover, and primary habitat/ESHA, at this site are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1d (Protective Measures for Western Snowy Plover), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)**. These measures would reduce impacts on sensitive natural communities, critical habitat, and primary habitat/ESHA during maintenance activities at the subsurface slant well as described for subsurface slant wells in Impact 4.6-2.

All Other Facilities

Operations and maintenance of the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), new Transmission Main, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System–Hidden Hills Interconnection Improvements would include periodic maintenance and inspections of existing facilities. Known maintenance efforts and inspections would be limited to already developed areas, which do not support sensitive natural communities or primary constituent elements of critical habitat. No impact on sensitive natural communities or critical habitat from operations and maintenance of these facilities are expected. No mitigation is required.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP operations could be inconsistent with applicable regulatory requirements related to sensitive natural communities, critical habitat, and primary habitat/ESHA that were adopted for the purpose of avoiding or mitigating an environmental effect. Specifically, the project could be inconsistent with the FESA, the Coastal Act, City of Marina General Plan Policies 4.112, 4.114, 4.116, 4.118, and 2.10; City of Marina LCLUP Policies 8, 19, 25, 26 and

Planning Guideline entitled Rare and Endangered Species: Habitat Protection, which were established to avoid or mitigate sensitive natural community, critical habitat, and primary habitat/ESHA impacts. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1d (Protective Measures for Western Snowy Plover), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)** would reduce impacts on sensitive natural communities, critical habitat, and primary habitat/ESHA as described for subsurface slant wells in Impact 4.6-2. Therefore, with these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirements.

Impact Conclusion

Operations of underground components and project facilities within previously disturbed project footprints, which do not support sensitive natural communities, ESHA, or primary constituent elements of critical habitat, are not expected to impact on sensitive natural communities. No mitigation is required.

Maintenance of the subsurface slant wells has potential to impact sensitive natural communities, primary habitat/ESHA, and critical habitat. Implementation of the proposed mitigation measures would reduce impacts on sensitive natural communities, primary habitat/ESHA and critical habitat to less than significant.

Foreseeable maintenance at the other facilities would not disturb any new areas. Therefore, no impact would result. No mitigation is required.

Overall, the project has potential to impact sensitive communities, which would be a significant impact. The impact would be less than significant with mitigation.

Mitigation Measures

Mitigation Measure 4.6-1a applies to the subsurface slant wells.

Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1b applies to the subsurface slant wells.

Mitigation Measure 4.6-1b: Construction Worker Environmental Awareness Training and Education Program.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1c applies to the subsurface slant wells.

Mitigation Measure 4.6-1c: General Avoidance and Minimization Measures.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1d applies to the subsurface slant wells.

Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1n applies to the subsurface slant wells.

Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-2a applies to subsurface slant wells.

Mitigation Measure 4.6-1p: Control Measures for Spread of Invasive Plants.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-2a applies to subsurface slant wells.

Mitigation Measure 4.6-2a: Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas.

(See Impact 4.6-2, above, for description.)

Mitigation Measure 4.6-2b applies to subsurface slant wells.

Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas.

(See Impact 4.6-2, above, for description.)

Impact 4.6-8: Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during project operations. (*Less than Significant with Mitigation*)

As described in Impact 4.6-3, waters of the U.S./waters of the state under the jurisdiction of the CCC, RWQCB, and/or USACE occur within and adjacent to the project area. Project operations would largely be confined to water transport within the new facilities and would not result in any new ground disturbance. Maintenance activities at the subsurface slant wells would include ground disturbance, which may result in impacts on waters of the U.S./waters of the state within or adjacent to the project area. Foreseeable maintenance activities at the remaining proposed facilities would not result in any new ground disturbance and would not result in impacts on waters of the U.S./waters of the state.

Subsurface Slant Wells

Maintenance of the subsurface slant wells would require cleaning of well heads approximately for a total duration of 9 to 18 weeks every 5 years. Maintenance activities would not occur in potential waters of the U.S./waters of the state.

The CEMEX settling ponds, potentially waters of the U.S./waters of the state, are located approximately 50 feet from the slant well Site 1. Indirect impacts on water quality are not expected as these ponds are surrounded by berms and slope should attenuate any potential project related discharges to these features. Furthermore, maintenance activities would disturb approximately 6 acres of land, and similar to construction activities, would require coverage under the NPDES Construction General Permit and preparation and implementation of a SWPPP. Mandatory compliance with the NPDES Construction General Permit, including implementation of the project-specific SWPPP, would further reduce the potential for water quality impacts. However, due to proximity, construction crews could inadvertently impact wetlands by walking or driving through them during maintenance, which would be a significant impact.

Implementation of the following mitigation measures would ensure that potential impacts on adjacent waters of the U.S./waters of the state would be reduced to less-than-significant levels: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, and **4.6-1c (General Avoidance and Minimization Measures).** These measures would reduce impacts on waters of the U.S./waters of the state from maintenance of the subsurface slant wells as described for subsurface slant wells in Impact 4.6-3.

All Other Facilities

Operations and maintenance of the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), new Transmission Main, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System–Hidden Hills Interconnection Improvements would include periodic inspections and repairs when needed. Any foreseeable disturbance associated with facility inspections, maintenance, and operations would be limited to developed areas that do not support waters of the U.S/waters of the state. No impact on waters of the U.S./waters of the state would result from maintenance and operations activities. No mitigation is required.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP operations could be inconsistent with applicable regulatory requirements related to waters of the U.S. and/or waters of the state. Specifically, the project could be inconsistent with the Sections 404 and 401 of the CWA, Section 10 of the Rivers and Harbors Act, the Porter-Cologne Act, the Coastal Act, City of Marina General Plan Policies 4.112, 4.114, 4.116, 4.118, and 2.10; City of Marina LCLUP Policy 26 and Planning Guidelines entitled Rare and Endangered Species: Habitat Protection, which were established to avoid or mitigate impacts on waters of the U.S. and/or waters of the state. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program),** and **4.6-1c (General Avoidance and Minimization Measures)** would reduce impacts on waters of the U.S. and/or waters of the state as described for subsurface slant wells in Impact 4.6-3. Therefore, with these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirements.

Impact Conclusion

Operations of underground components and project facilities within previously disturbed project footprints, which do not contain waters of the U.S./waters of the state, would result in no impact on waters of the U.S./waters of the state. No mitigation is required.

Maintenance of the subsurface slant wells has potential to impact potential waters of the U.S./waters of the state. Implementation of the proposed mitigation measures would reduce impacts on waters of the U.S/waters of the state to less than significant.

Foreseeable maintenance at the other facilities are not expected to disturb any new areas. Therefore, no impact is expected. No mitigation is required.

Overall, the project has potential to impact waters of the U.S./waters of the state, which would be a significant impact. The impact would be less than significant with mitigation.

Mitigation Measures

Mitigation Measure 4.6-1a applies to the subsurface slant wells.

Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1b applies to the subsurface slant wells.

Mitigation Measure 4.6-1b: Construction Worker Environmental Awareness Training and Education Program.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1c applies to the subsurface slant wells.

Mitigation Measure 4.6-1c: General Avoidance and Minimization Measures.

(See Impact 4.6-1, above, for description.)

Impact 4.6-9: Introduce or spread an invasive non-native species during project operations. (*Less than Significant with Mitigation*)

Periodic maintenance activities at the subsurface slant wells would include ground disturbance, which could contribute to the spread of invasive plants and/or introduce new invasive plants to the project area or adjacent lands with native plant communities through earth moving, transport of vehicles, equipment and materials, and unanticipated sediment dispersal during rain events, which would be a significant impact.

Implementation of **Mitigation Measure 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures) and 4.6-1p (Control Measures for Spread of Invasive Plants)** would reduce impacts to less than significant by designating a lead biologist to oversee and ensure implementation of special-status species and sensitive natural community protective measures and requiring implementation of measures, such as cleaning tools and equipment, to reduce the introduction or spread of invasive species.

Foreseeable maintenance activities at the remaining proposed facilities would not result in any new ground disturbance and would not spread or introduce invasive species.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP operations could be inconsistent with applicable regulatory requirements related to the introduction or spread of invasive species. Specifically, the project could be inconsistent with Executive Order 13112, which was established to avoid or mitigate impacts from the introduction or spread of invasive species. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)** and **4.6-1p (Control Measures for Spread of Invasive Plants)** would reduce impacts from the introduction or spread of invasive species by designating a lead biologist to oversee and ensure implementation of special-status species and sensitive natural community protective measures and requiring implementation of measures, such as cleaning tools and equipment, to reduce the introduction or spread of invasive species. Therefore, with these measures implemented, the MPWSP would be brought into conformance with Executive Order 13112.

Impact Conclusion

Operations of underground components and project facilities within previously disturbed project footprints would not have the potential to introduce or spread invasive species into native plant communities. Therefore, no impact would result from operations of these facilities and no mitigation is required.

Maintenance of the subsurface slant wells has potential to introduce or spread invasive species into native plant communities. Implementation of the proposed mitigation measures would reduce impacts from the introduction or spread of invasive species to less than significant.

Foreseeable maintenance at the other facilities would not disturb any new areas. Therefore, no impact is expected. No mitigation is required.

Overall, the project has potential to introduce or spread invasive species, which would be a significant impact. The impact would be less than significant with mitigation.

Mitigation Measures

Mitigation Measure 4.6-1a applies to the subsurface slant wells.

> **Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.**
>
> (See Impact 4.6-1, above, for description)

Mitigation Measure 4.6-1p applies to the subsurface slant wells.

> **Mitigation Measure 4.6-1p: Control Measures for Spread of Invasive Plants.**
>
> (See Impact 4.6-1, above, for description)

Impact 4.6-10: Be inconsistent with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan during construction or operations. (*Less than Significant with Mitigation*)

The proposed project's consistency with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan during construction or operations is addressed below. Impacts to HMP special-status species and sensitive natural communities with potential to occur and be impacted by the proposed project are addressed in Impacts 4.6-1, 4.6-2, 4.6-6, and 4.6-7 above.

New Transmission Main

The portion of the new Transmission Main along the Monterey Peninsula Recreational Trail is located within the HMP area. It is located within an area designated as Development with Reserve Areas or Development with Restrictions. This designation includes lands that are slated for development in the HMP that contain inholdings of habitat reserve land or require development restrictions to protect habitat within or adjacent to the parcel. The new Transmission Main would pass through the HMP's Caltrans State Route 1 Area within the Development with Reserve Areas or Development with Restrictions category. The management requirements for these parcels specify that in conjunction with any transportation work conducted by Caltrans, Caltrans will restore and enhance native coastal strand, dune scrub, and sand hill maritime chaparral habitats in the road shoulders and medians in areas that will not conflict with anticipated highway expansion, improvements, operations, or maintenance. Even though the HMP only describes the potential for Caltrans transportation in this corridor, for the purpose of this analysis, we assume that the intent of the measure was to ensure that any projects that temporarily disturbed native habitat would restore and enhance these areas following construction. Construction of the new Transmission Main would temporarily impact central dune scrub habitat, which would be inconsistent with the HMP, which is a significant impact.

Implementation of **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1n (Habitat Mitigation and Monitoring Plan),** and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)** would ensure that the proposed project is not inconsistent with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan and would reduce potential impacts to a less-than-significant level. These measures would reduce impacts by designating a lead biologist to oversee and ensure implementation of special-status species and sensitive natural community protective measures; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; and requiring measures to minimize and/or mitigate impacts on sensitive natural communities such as restoration of temporarily impacted sensitive communities, to ensure no net loss of habitat; and ensuring that measures that may be required to be implemented as part of the HMP are implemented for the proposed project.

Similar to the HMP, the new Transmission Main alignment is located within an area designated as a Development with Reserve Areas or Development with Restrictions. If the Draft HCP is approved and permitted before the proposed project is implemented, this facility may be subject to additional mitigation measures required under the approved HCP, which cannot be known at this time.

Since the new Transmission Main and the new Transmission Main using the optional alignment would have the same potential impacts, the same impacts and mitigation measures would apply to the new Transmission Main using the optional alignment as apply to the new Transmission Main.

Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline) and Staging Areas

The proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline) and some staging areas are located within the HMP area. However, these proposed facilities are located within designated development areas that do not border a NRMA. Per the HMP, no resource conservation or resource management requirements are associated with projects in these parcels. Therefore, construction of these facilities would be consistent with adopted habitat conservation plans or natural community conservation plans or other approved local, regional, or state habitat conservation plans. No impact is expected. Impacts to HMP special-status species and sensitive natural communities with potential to occur and be impacted by the proposed ASR Facilities are addressed in Impacts 4.6-1, 4.6-2, 4.6-6, and 4.6-7 above.

Similar to the HMP, the proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline) and some staging areas are located within Designated Development Areas in the Draft HCP. If the Draft HCP is approved and permitted before the proposed project is implemented, these facilities may be subject to additional mitigation measures required under the approved HCP, which cannot be known at this time.

All Other Proposed Project Facilities

Implementation of the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System–Hidden Hills Interconnection Improvements are not located within the HMP or HCP areas and therefore would not be subject to conformance with adopted habitat conservation plans, natural community conservation plans, or other approved local, regional, or state habitat conservation plans during construction as none occur at these facility sites. No impact is expected.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP construction and operations could be inconsistent with applicable regulatory requirements related to an approved HMP or HCP. Specifically, the project could be inconsistent with the City of Marina General Plan Policy 4.115, which was established to reduce impacts on species and habitat areas within an approved HMP or HCP. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1n (Habitat Mitigation and Monitoring Plan),** and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)** would reduce potential inconsistencies with an approved HMP or HCP as described above for the new Transmission Main. Therefore, with these measures implemented, the MPWSP would be consistent with the above-noted regulatory requirements.

Impact Conclusion

The portion of the new Transmission Main along the Monterey Peninsula Recreational Trail is located within the approved HMP area and construction and operations of this component could be inconsistent with the HMP, which would be a significant impact. Implementation of **4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1n (Habitat Mitigation and Monitoring Plan), and 4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)**would reduce potential impacts to a less-than-significant level by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring implementation of measures, such as cleaning tools and equipment, to reduce the introduction or spread of invasive species; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; and requiring measures to minimize and/or mitigate impacts on sensitive natural communities such as restoration of temporarily impacted sensitive communities, to ensure no net loss of habitat.

The proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline) and some staging areas are located within the HMP area. However, these proposed facilities are located within designated development areas and construction and operations of these facilities would be consistent with the HMP. The remaining facilities are not located within the HMP area and would not be subject to conformance with the HMP. No impact and no mitigation required.

Overall, the project would be inconsistent with the HMP, which would be a significant impact. The impact would be less than significant with mitigation.

Mitigation Measures

Mitigation Measure 4.6-1a applies to the New Transmission Main and New Transmission Main Optional alignment.

Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.

(See Impact 4.6-1, above, for description)

Mitigation Measure 4.6-1n applies to the New Transmission Main and New Transmission Main Optional alignment.

Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan.

(See Impact 4.6-1, above, for description)

Mitigation Measure 4.6-2b applies to the New Transmission Main and New Transmission Main Optional alignment.

Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas

(See Impact 4.6-2, above, for description)

4.6.6 Cumulative Effects of the Proposed Project

Impact 4.6-C: Cumulative impacts related to terrestrial biological resources (*Significant and Unavoidable*)

The geographic scope of analysis for cumulative impacts on terrestrial biological resources includes sites proposed for MPWSP components, as well as biologically linked terrestrial areas within approximately 5 miles of these sites. This cumulative impact analysis considers the incremental effects of the proposed project, when combined with the effects of past, present, and reasonably foreseeable projects (as listed in **Table 4.1-2** and shown on **Figure 4-1**) on special-status species, riparian habitat, critical habitat, or other sensitive natural communities, ESHA, wetlands or other waters of the U.S. or state, and trees protected by local tree ordinances.

Special-Status Species and Sensitive Natural Communities

Many of the projects within the geographic scope of analysis occur on former Fort Ord lands, including the East Garrison Specific Plan (No. 2), Cypress Knolls Senior Residential Project (No. 8), Marina Heights (No. 9), Marina Airport Economic Development Area (No. 11), Rockrose Gardens (No. 39), CSUMB North Campus Housing Master Plan (No. 13), ITCD Academic Building (CSUMB) (No. 40), The Seaside Resort (No. 16), Monterey Downs and Horse Park and Central Coast Veteran's Cemetery Specific Plan (No. 17), Main Gate Specific Plan (No. 18), Seaside Groundwater Basin Aquifer Storage and Recovery (Phase 1) (No. 29), Seaside Groundwater Basin Aquifer Storage and Recovery (Phase 2) (No. 30), and Fort Ord Dunes State Park Campground (No. 46). The Fort Ord HMP, which cover the former Fort Ord lands, has established designated development areas and habitat reserves on former Fort Ord lands to mitigate impacts from projects within development areas on biological resources, such as Monterey spineflower, sandmat manzanita, Smith's blue butterfly, black legless lizard, California red-legged frog, California tiger salamander, and western snowy plover, on a regional scale. The preservation of certain habitat types such as maritime chaparral and central dune scrub within these habitat reserves also protects habitat for other species not directly impacted by the HMP, such as coast horned lizard, globose dune beetle, Salinas kangaroo rat, and badger. The preservation of habitat reserves not only benefits these species within the former Fort Ord, but also benefits these same species on a regional scale within the southern Monterey Bay Area.

As noted, the HMP proposes actions that mitigate the effects of projects within the Fort Ord Reuse Plan area on habitat communities and associated species explicitly identified for conservation in the HMP. It is possible that the MPWSP and additional projects proposed within the HMP area could affect other habitat types that are not explicitly identified for conservation in the HMP (e.g., non-native grassland, coastal sage scrub, and oak woodland). If not properly mitigated, cumulative impacts from these projects on such habitats and dependent special-status species could be significant, and the proposed project could have a cumulatively significant contribution. As discussed in Impacts 4.6-1, 4.6-2, 4.6-6, and 4.6-7, most of the impacts from the MPWSP on such habitat communities would be temporary, although some permanent impact would result. As summarized in the following subsections, with mitigation, the residual effect of the MPWSP on these habitat types would be negligible. As a result, after implementation of mitigation, the MPWSP would have a less than significant cumulative impact on habitats within the HMP area.

Western Snowy Plover

As described in Impacts 4.6-1, 4.6-2, 4.6-6, and 4.6-7, and as summarized in **Table 4.6-6**, construction and operation of the MPWSP components could impact special-status species and the sensitive natural communities that support these species. The MPWSP would result in temporary and permanent impacts on western snowy plover that, given the sensitivity of this species, could result in a significant contribution to a significant cumulative impact. Cumulative projects identified in **Table 4.1-2** and within the geographic scope of cumulative impact analysis could also impact western snowy plover. Specifically, the CEMEX Removal Plan (No. 63), Monterey Shores Resort (No. 19), 90-Inch Bay Avenue Outfall Phase 1 (No. 43), Slant Test Well Project (No. 47), Moss Landing Community Plan (No. 37), and The Collection at Monterey Bay Resort (No. 56) would affect beach or dune areas that may support western snowy plover. Implementation of the CEMEX Removal Plan, Monterey Bay Shores Resort and Moss Landing Community Plan projects could occur at the same time as the proposed MPWSP construction and therefore could adversely affect western snowy plover and its habitat through heavy equipment use, dust generation, elevated noise levels, increased human activity, and loss of habitat. The exact acreage of western snowy plover habitat that would be impacted from these cumulative projects is unknown, but could be 40 to 60 acres of coastal dune habitat. Although not all of this is within mapped western snowy plover critical habitat, for purposes of comparison, this would be a small percentage compared to the approximately 1,600 acres of mapped western snowy plover critical habitat within the Monterey Bay area. Additionally, other coastal dune habitat provides habitat for western snowy plovers beyond this 1,600 acres of mapped critical habitat. While removal of structures required by the CEMEX Removal Plan could temporarily disturb snowy plover habitat, the plan also requires restoration of the affected area with grading and seeding; therefore, the CEMEX Removal Plan could eventually provide beneficial impacts to snowy plover habitat. However, these overall effects of these projects would be cumulatively significant. Implementation of **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures); 4.6-1b (Construction Worker Environmental Awareness Training and Education Program); 4.6-1c (General Avoidance and Minimization Measures); 4.6-1d (Protective Measures for Western Snowy Plover); 4.6-1n (Habitat Mitigation and Monitoring Plan); 4.6-1p (Control Measures for Spread of Invasive Plants); 4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas); 4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas); 4.6-6 (Installation and Monitoring of Bird Deterrents at the Brine Storage Basin); 4.12-1b (General Noise Controls for Construction Equipment);** and **4.14-2 (Site-Specific Nighttime Lighting Measures)** would reduce project-specific impacts to a less-than-significant level as described above under Impact 4.6-1, 4.6-2, 4.6-6, and 4.6-7. The proposed project would implement several measures including: avoiding work in the breeding season, ensuring any work that is conducted during the breeding season would not impact nesting western snowy plover, and implementing measures to minimize impacts on wintering western snowy plover. With implementation of these measures, the proposed project would minimize impacts on individual birds and would not adversely impact the western snowy plover population in the region. In regards to habitat impacts, the subsurface slant wells would be located within and adjacent to potential western snowy plover nesting habitat, and operation of the wells, including maintenance around the well heads could prevent use of the backdune habitat for nesting, which has been documented previously. Overall, the proposed project would result in 7 acres of permanent and 2 acres of temporary impact on western snowy plover habitat. Following implementation of **Mitigation Measure 4.6-1d**, residual temporary impacts on snowy plovers (i.e., during construction and subsurface slant well maintenance) would be minimal, and permanent loss of western snowy plover habitat would be compensated at a minimum 3:1 ratio through on-site or off-site creation, restoration, enhancement, or preservation of habitat for western snowy plover. Implementation of this measure would ensure that there is no overall permanent loss of available and functional western snowy plover habitat within the region. Thus, after mitigation, the permanent loss of snowy plover habitat attributable to the proposed project would be less than significant. The MPWSP Desalination Plant and Carmel Valley Pump Station also would have operational impacts beyond the construction phase, but are not located in western snowy plover habitat. For these reasons, with mitigation, the incremental effects of the MPWSP would have a less than significant contribution to cumulative effects on western snowy plover.

Migrating Waterfowl

As described in Impact 4.6-6, operation of the brine storage basin at the MPWSP Desalination Plant could impact migrating waterfowl. The Dredge Laguna Grande and Roberts Lake Project (No. 42) could potentially impact migratory waterfowl by disturbing them during dredging activities, but this would be a short-term effect. The exact acreage of disturbance is unknown, but may be up 20 acres. Through implementation of the CEMEX Removal Plan (No. 63), the existing dredge pond located at the CEMEX property, which provides habitat for migratory waterfowl, would be reclaimed by natural processes. This reclamation would result in the eventual loss of the 1.5-acre dredge pond. Although the impacts to migratory waterfowl would be short-term (for dredging of Laguna Grande and Roberts Lake) and small (for reclamation of the dredge pond), these projects could contribute to a significant cumulative impact on migrating waterfowl, when viewed in combination with the proposed project's significant impact. Implementation of **Mitigation Measure 4.6-6 (Installation and Monitoring of Bird Deterrents at the Brine Storage Basin)** would reduce project-specific impacts to a less-than-significant level as described above under Impact 4.6-6. Additionally, the potential residual impacts from the brine pond, which may include illness or mortality of a few birds that aren't deterred from the brine storage basin, would only occur when it is in use periodically. Thus, after mitigation, the effects of these projects would not combine to result in a significant cumulative impact on migrating waterfowl due to the intermittent and/or short-term nature of the impacts. Therefore, with mitigation, the residual effects of the MPWSP would have a less than significant contribution to the cumulative effect.

Sensitive Vegetation Types, ESHA, and Wildlife Habitat

Construction and operation of the MPWSP would temporarily impact approximately 11 acres and permanently impact approximately 16 acres of non-native grassland, temporarily impact approximately 17 acres and permanent impact approximately 7 acres of central dune scrub, temporarily impact approximately 0.2 acre and permanently impact approximately 0.06 acre of northern coastal scrub, temporarily impact approximately 11 acres of central maritime chaparral, and temporarily impact approximately 0.7 acre and permanently impact approximately 0.04 acre of oak woodland. Construction and operation of the MPWSP would temporarily impact approximately 29 acres and permanently impact approximately 7 acres of ESHA. Areas of ESHA overlap with the vegetation types described above in the coastal zone. Disruption to these habitat communities could also affect special-status species that rely upon these habitats, including: Monterey spineflower, robust spineflower, seaside bird's beak, Menzies' wallflower, sand gilia, Yadon's rein orchid, Smith's blue butterfly, California tiger salamander, California red-legged frog, Hickman's onion, Hooker's manzanita, Toro manzanita, Pajaro manzanita, sandmat manzanita, Monterey Coast paintbrush, Monterey ceanothus, Congdon's tarplant, branching beach aster, Eastwood's goldenbush, sand-loving wallflower, Kellogg's horkelia, Carmel Valley bush-mallow, marsh microseris, northern curly-leaved monardella, south coast branching phacelia, Michael's rein orchid, Monterey pine, Santa Cruz microseris, Santa Cruz clover, Pacific

Grove clover, globose dune beetle, black legless lizard, silvery legless lizard, coast horned lizard, Coast Range newt, western burrowing owl, Monterey dusky-footed woodrat, Monterey shrew, American badger, and special-status bats and birds (Impact 4.6-1). Cumulative projects identified in **Table 4.1-2** and within the geographic scope of cumulative impact analysis could also adversely affect the above-listed habitat communities and associated species. Specifically, the Salinas Valley Water Project Phase II (No. 1), Laguna Seca Villas (No. 3), Omni Enterprises, LLC (No. 4), Ferrini Ranch Subdivision (No. 5), Marina Downtown Vitalization Specific Plan (No. 10), Marina Station (No. 12), Monterey Bay Shores Resort (No. 19), Rancho Canada Village (No. 27), Rancho Canada Golf Club (No. 28), RUWAP Desalination Element (No. 31), RUWAP Recycled Water Element (No. 35), Moss Landing Community Plan (No. 37), TAMC Monterey Peninsula Light Rail Project (No. 38), Slant Test Well Project (No. 47), The Collection at Monterey Bay Resort (No. 56), and 90-Inch Bay Avenue Outfall Phase 1 (No. 43) could have impacts on non-native grassland, central dune scrub, northern coastal scrub, central maritime chaparral, and/or oak woodland as well as ESHA. Implementation of the CEMEX Removal Plan (No.63) may result in short-term impacts on central dune scrub (which may be considered ESHA), but overall would restore and enhance this sensitive resource. Concurrent construction and/or operation of these projects could result in a significant cumulative impact on sensitive habitat communities and associated special-status species and ESHA through vegetation trimming or removal, elevated noise and dust levels, and increased human presence. The exact acreage of these habitats that would be impacted from these cumulative projects is unknown. A review of other environmental documents prepared for some of these projects indicate that there could be several hundreds of acres of grassland impacted, 70 to 100 acres of central dune or coastal scrub impacted, and several hundreds of acres of oak woodland impacted. Most MPWSP effects would be limited to the 24-month construction phase, with restoration of temporarily disturbed areas to previous conditions or better at the end of construction. Implementation of **Mitigation Measures 4.6-1a; 4.6-1b; 4.6-1c; 4.6-1e (Avoidance and Minimization Measures for Special-status Plants); 4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly); 4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard); 4.6-1h (Avoidance and Minimization Measures for Western Burrowing Owl); 4.6-1i (Avoidance and Minimization Measures for Nesting Birds); 4.6-1j (Avoidance and Minimization Measures for American Badger); 4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat); 4.6-1l (Avoidance and Minimization Measures for Special-Status Bats); 4.6-1m (Avoidance and Minimization Measures for Native Stands of Monterey Pine); 4.6-1n; 4.6-1o (Avoidance and Minimization Measures for California red-legged frog and California tiger salamander); 4.6-1p (Control Measures for Spread of Invasive Plants), 4.6-2a; 4.6-2b; 4.6-6; 4.12-5 (Stationary Source Noise Controls)** and **4.14-2** would mitigate for any potential permanent effects and reduce project-specific impacts to less-than-significant levels as described in Impacts 4.6-1, 4.6-2, 4.6-6, and 4.6-7 above. The proposed project would implement several measures including conducting pre-construction surveys for special-status species and relocating species outside of the construction area, avoiding impacts to sensitive habitats, and, if direct impacts cannot be avoided, providing appropriate compensation in the form of on-site or off-site restoration, enhancement or preservation. Implementation of these measures would ensure that there is minimal injury or death of individuals and the project would not adversely impact special-status species populations in the region. Additionally, through restoration and compensation, implementation of these measures would ensure that impacts to functional special-status species and sensitive habitat would be adequately mitigated. Given the limited extent and duration of effects at any given MPWSP component site, the prevalence of such habitats within the geographic scope of analysis relative to the areas of MPWSP effect, the nearby availability of such habitats for use by species displaced during the construction period, and the required implementation of the proposed mitigation measures, the MPWSP's residual incremental contribution to cumulative effects on sensitive natural communities would be less than significant.

Construction of MPWSP components would temporarily impact approximately 0.06 acre of freshwater marsh and approximately 1.3 acre of riparian woodland and scrub. Disruption to these habitat communities could also affect special-status species reliant upon these habitats, such as western pond turtle and tricolored blackbird. Three foreseeable projects within the geographic scope of cumulative analysis could also affect freshwater marsh and riparian woodland and scrub habitats: the Ferrini Ranch Subdivision (No. 5), Rancho Canada Village (No. 27) and TAMC Monterey Peninsula Light Rail Project (No. 38). Construction of these projects could cause direct or indirect impacts on the sensitive freshwater marsh and riparian vegetation and wildlife habitat, and associated special-status species, resulting in a significant cumulative effect to which the proposed project could have a significant contribution. The exact acreage of freshwater marsh and riparian vegetation that would be impacted from these cumulative projects is unknown, but could be approximately 15 acres. The MPWSP would avoid two perennial water features (the Salinas River and Tembladero Slough) through attaching the pipeline to an existing bridge horizontal directional drilling (an option not available to the three cumulative projects), which would substantially minimize its contribution to cumulative impacts. Additionally, implementation of **Mitigation Measures 4.6-1a, 4.6-1b, 4.6-1c, 4.6-1i, 4.6-1n, 4.6-1p, 4.6-2a,** and **4.6-2b** would reduce the project-specific impacts to less-than-significant levels as described in Impacts 4.6-1 and 4.6-2 above. These mitigation measures would include installation of best management practices to reduce indirect impacts from erosion, ensuring equipment is fueled at least 50 feet from drainages, avoiding direct impacts to these features, and, if direct impacts cannot be avoided, requiring restoration of temporarily impacted areas and permanent compensation for permanent loss. Implementation of these measures would ensure that there would be minimal indirect impacts and there would be no net loss of available and functional wetland and riparian habitat. The Ferrini Ranch Subdivision is located over 5 miles from the MPWSP and, because of this distance, construction of these two projects would not impact the same specific sensitive habitat feature, although it could affect the same habitat type. Additionally, due to the limited duration of potential effects, the restoration of disturbed areas following construction, the availability of other similar habitats for use by displaced species during construction, and the required implementation of the proposed mitigation measures, the cumulative effects from the MPWSP would be less than significant.

Wetlands or Other Waters

As described in Impacts 4.6-3 and 4.6-8, MPWSP construction and operation could temporarily impact approximately 1.6 acre of federal wetlands, federal other waters, and/or waters of the state. These impacts would be temporary and, upon completion of construction, any affected wetlands would be restored to their approximate pre-construction condition. Many of the projects listed in **Table 4.1-2** could cause temporary or permanent impacts on federal wetlands, federal other waters, and/or waters of the state. Specifically, the TAMC Monterey Peninsula Light Rail Project (No. 38), Ferrini Ranch Subdivision (No. 5), Marina Station (No. 12), Moss Landing Community Plan (No. 37), Dredge Laguna and Roberts Lake (No. 42), Monterey Pacific Grove ASBS Stormwater Management Project (No. 45), and Route 156 West Corridor Project (No. 53) would result in temporary or permanent impacts on wetlands and other waters. Other projects listed in **Table 4.1-2** may have similar effects. The exact acreage of wetland and other waters that would be impacted from these cumulative projects is unknown, but could be 35 acres. Concurrent construction and/or operation of these projects could result in significant cumulative impacts on these resources through wetlands fill or draining and increased human presence, to which the proposed project could have a significant contribution. Implementation of **Mitigation Measures 4.6-1a, 4.6-1b, 4.6-1c,** and **4.6-3 (Avoid, Minimize, and or Mitigate Impacts to Wetlands)** would reduce the project-specific impacts to less-than-significant levels as described in Impacts 4.6-3 and 4.6-8, above. The proposed project would implement several measures including: installation of best management practices to reduce indirect impacts from erosion, ensuring equipment is fueled at least 50 feet from drainages, avoiding direct impacts to these features, and, if direct impacts cannot be avoided, requiring restoration of temporarily impacted areas and compensation for permanent loss. Implementation of these measures would ensure that there would be minimal indirect impacts and there would be no net loss of available and functional wetlands and waters. The MPWSP's effects on federal wetlands, federal other waters, and/or waters of the state would be temporary and limited to a small percentage of wetland habitat in the geographic scope of analysis – the MPWSP would potentially temporarily impact a maximum of approximately 1.6 acre of wetlands or other waters compared to approximately 5,500 acres of potential freshwater wetlands within the geographic scope of analysis as mapped by the National Wetland Inventory (USFWS, 2016). Additionally, a considerable amount of nearby wetlands habitat available for displaced species and ecological function would remain within the geographic scope of analysis, and the MPWSP effects would be temporary and fully restored upon completion of construction. Also, the Corps, RWQCB, CDFW, and/or the CCC may take jurisdiction over many of the water features that could be impacted by these other cumulative projects. If these other cumulative projects impact jurisdictional wetland or water features, those actions would be regulated by the Corps, RWQCB, CDFW, and/or the CCC and these agencies would impose measures to minimize and/or compensate for impacts on jurisdictional resources. Therefore, the MPWSP's incremental contribution to an adverse cumulative impact on wetlands habitat would be less than significant with mitigation.

City of Marina Local Coastal Program Land Use Plan

As described in Impact 4.6-4, construction of MPWSP components would be inconsistent with the City of Marina LCLUP since the project is not a resource-dependent use. Implementation of **Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover**, **Mitigation Measures 4.6-1e: Avoidance and Minimization Measures for Special-Status Plants**, **Mitigation Measure 4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly**, **Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat**, and **Mitigation**

Measure 4.6-1n: Habitat Mitigation and Monitoring Plan would reduce impacts on special-status species habitat, as described in Impact 4.6-4 above, but the project would still be inconsistent with the LCLUP.

The test slant well at the CEMEX site is a cumulative project that is within the geographic scope of this analysis. The test slant well was also found to be inconsistent with the City of Marina LCLUP. Implementation of the proposed project would have a significant contribution to this test slant well impact related to inconsistencies with the city of Marina LCLUP. No mitigation measures are available that would reduce this impact to a level that is less than significant (*significant and unavoidable*).

Local Tree Ordinances

A significant cumulative impact would result if the incremental effects of the MPWSP combined with those of cumulative projects to be inconsistent with local tree ordinances. As described in Impact 4.6-4, construction of MPWSP components could require trimming or removal of protected trees, inconsistent with local tree ordinances. Other projects identified in **Table 4.1-2** that are within the geographic scope of cumulative impacts analysis may also need to trim or remove trees that are subject to local tree protection ordinances. For example, the Ferrini Ranch Subdivision (No. 5), Monterey Downs and Horse Park and Central Coast Veteran's Cemetery Specific Plan (No. 17) and Route 156 West Corridor Project (No. 53) would involve removal of a substantial number of trees. Local governments with jurisdiction over the geographic scope of cumulative impacts analysis (e.g., Seaside and Monterey County) have tree ordinances established for the purpose of protecting important trees and compensating for their removal. If the MPWSP and cumulative projects within the geographic scope of cumulative impact analysis involved tree removal and failed to comply with applicable tree ordinances, a significant cumulative effect would result, to which the proposed project could have a significant contribution. Implementation of **Mitigation Measure 4.6-4 (Compliance with Local Tree Ordinances)** would reduce the project-level impacts to less-than-significant levels as described in Impact 4.6-4, above. Avoiding the removal of trees, or compliance with tree removal permit requirements by replacing protected trees at a minimum one-to-one ratio as required in Table 4.6-10, would minimize or mitigate impacts on locally protected trees such that residual impacts on trees would be minimal and would no longer be inconsistent with local tree ordinances. Therefore, with mitigation, the residual effects of the MPWSP regarding being inconsistent with local tree ordinances would be minimal and would have a less than contribution to a significant cumulative impact.

Inconsistent with an adopted Habitat Conservation Plan

As described in Impact 4.6-10, portions of the Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline) located east of General Jim Moore Boulevard, and portions of the new Transmission Main and new Transmission Main using the optional alignment are located within the *1997 Installation-Wide Multispecies* HMP. As described above, many cumulative projects occur on former Fort Ord lands within the boundaries of the HMP. Construction and operation of these projects may include activities subject to HMP resource conservation and management requirements. Failure of the MPWSP and one or more cumulative project to implement an applicable HMP conservation and/or management requirement would constitute a significant cumulative impact to which the proposed project could have a significant contribution. Installation of the new Transmission Main facilities would be required to comply with HMP-prescribed measures which would be implemented through project-level mitigation, including **4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), Mitigation Measures 4.6-1p (Control Measures for Spread of Invasive Plants), and 4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas)**. These measures would reduce project-level impacts to less-than-significant levels as described in Impact 4.6-10 above as the project would be consistent with the HMP. Therefore, with mitigation, the effects of the MPWSP regarding being inconsistent with an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan would be less than significant with mitigation.

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Zander Associates, 2014. Email from Leslie Zander, Zander Associates, to Chris Rogers, Environmental Science Associates regarding special status plant observations from the April 24, 2014 survey at CEMEX. May 9, 2014.

4.7 Hazards and Hazardous Materials

This section evaluates the potential for construction and operation of the Monterey Peninsula Water Supply Project (MPWSP or proposed project) to result in adverse impacts associated with hazards or hazardous materials, including releases of hazardous materials through routine use or accidents, being located near schools, airports, or within a high fire hazard area, or impairing emergency routes. The analysis is based on review of available hazards and hazardous materials websites, reports, and maps of the project area and vicinity, including reports and information posted on websites by the State Water Resources Control Board and the Department of Toxic Substances Control, and project-specific investigations conducted for various project components.

Comments received on the 2015 Draft EIR requested information on a hazardous materials site located along 1st Avenue in the City of Marina, noted the mis-location of one hazardous materials site on a figure and requested locating nearby schools on a map; the Fort Ord - University Villages site has been included and discussed in Section 4.7.1.1, the list and locations of hazardous materials sites has been updated and Figures 4.7-1 and 4.7-2 have been revised. Commenters requested a discussion on the possibility of frac-out during drilling, spill prevention measures, and a soil sampling and analyses for hazardous materials; these are now addressed in Impact 4.7-1 and Impact 4.7.2. Commenters requested the specific locations where trenchless drilling would be used for pipeline installation, and this is now discussed in Section 3.3.5.2.

As a result of comments received on the January 2017 Draft EIR/EIS, revisions have been made to this EIR/EIS section. Those changes include:

- *Additional language about CalAm's potential responsibility under CERCLA is the MPWSP were to adversely affect the ongoing cleanup activities.*

4.7.1 Setting/Affected Environment

The study area for evaluation of hazards and hazardous materials impacts includes the project components and the vicinity adjacent to the components. In addition, the vicinity up to 0.25 mile from project components is considered relative to schools and up to 2 miles relative to airports. There is no known soil or groundwater contamination or wildfire hazard within MBNMS, nor any existing hazardous material usage within MBNMS that could be affected by the proposed project. Therefore, MBNMS resources are not described in the environmental setting/affected environment.

4.7.1.1 Soil and Groundwater Conditions

This section assesses the potential for hazardous materials to be present in soil and groundwater in the project area as a result of past and present land uses, and documented releases of hazardous materials in the project vicinity. This discussion is based on review of regulatory agency databases and hazardous materials investigation reports available on regulatory agencies' websites, information available on the Fort Ord Reuse Authority (FORA) website, available environmental assessments prepared for the Transportation Agency for Monterey County (TAMC) corridor and the 46-acre MPWSP Desalination Plant site, and site reconnaissance.

Past and Present Land Uses in the Project Vicinity

Various past and current land uses associated with the use, generation, or disposal of hazardous materials exist in the project vicinity: the Monterey Regional Waste Management District (MRWMD) landfill, the Monterey Regional Water Pollution Control Agency (MRWPCA) Regional Wastewater Treatment Plant, the former Fort Ord military base, commercial buildings, gasoline stations, railroad tracks, agricultural fields, residences, and recreational and open spaces. In some cases, these land uses have contributed to subsurface contamination that could be exposed during project construction and result in adverse environmental and health effects.

There is a potential for the following land uses in the project vicinity to have caused soil and/or groundwater contamination in the project area:

- ***Commercial/Industrial Uses.*** Commercial and industrial land uses include former and current gasoline service stations, dry cleaners, and other facilities that typically involve the use and storage of fuel, lubricants and oil, solvents, and other hazardous materials. Facilities with known releases of hazardous materials that have affected soil or groundwater are discussed below under the heading, Regulatory Agency Database Searches.
- ***Agricultural Uses.*** Portions of the proposed Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, and Brine Discharge Pipeline are located within agricultural areas, and the proposed MPWSP Desalination Plant site is adjacent to agricultural fields. Historical agricultural land uses may leave behind residual levels of pesticides and herbicides in soils. In addition, farm equipment typically uses petroleum products and cleaning solvents (for equipment maintenance), which, in some cases, may have been released during use or storage. According to the Phase I Environmental Assessment for the 46-acre MPWSP Desalination Plant parcel,[1] the site was formerly owned by the Dole Food Company; however, the site appears to have historically been utilized as vacant land and no evidence of hazardous substances or petroleum products were noted (RBF Consulting, 2012).
- ***Railroad Operations.*** A preliminary environmental assessment of the Transportation Agency of Monterey County (TAMC) railroad corridor identified environmental concerns regarding the railroad alignment that would also overlap or be near portions of the proposed

[1] As described in Section 3.2.2 of Chapter 3, Description of the Proposed Project, the MPWSP Desalination Plant would be constructed on the upper terrace (approximately 25 acres) of the 46-acre parcel.

Castroville Pipeline, Source Water Pipeline, new Desalinated Water Pipeline, and the new Transmission Main Pipeline alignments (Kleinfelder, 2010). Soil along the railroad alignment may have been affected by fuel, oil, lubricants, and metals (e.g., cadmium, chromium, copper, nickel, and lead) leaking from railroad engines and cars over time. The railroad ties are typically wood that has been treated with creosote and less commonly copper, chrome, arsenic, and/or pentachlorophenol. Vegetation control is typically conducted using rail-mounted equipment that sprays herbicides along rail alignments.

- ***Sand Mining.*** The proposed Seawater Intake System and a portion of the Source Water Pipeline would be located within the CEMEX sand mining facility. Mining operations typically require the use of fuels and lubricants for equipment. The CEMEX facility was not listed as having a permitted UST or recorded releases in the regulatory agency database search discussed below under the heading, Regulatory Agency Database Searches.
- ***Former Fort Ord Military Base.*** Fort Ord was listed on the National Priorities List in 1990. Contaminated areas include munitions response sites; the Fritzsche Airfield Fire Drill Pit (Operable Unit [OU] 1); the Fort Ord landfill (OU2); firing ranges; hazardous waste storage areas; and unregulated disposal areas. Both soil and groundwater were impacted by contaminants in these areas, which have been investigated separately. The proposed ASR-5 and ASR-6 Wells, ASR Pipelines, and portions of the new Transmission Main would be within the Fort Ord Seaside Munitions Response site (LFR et al, 2011), which has potential unexploded ordnance hazards.[2] The former Fort Ord military base site is discussed in more detail below.

Regulatory Database Searches of Hazardous Materials Sites

Regulatory agency databases of hazardous materials sites that are compiled pursuant to Government Code Section 65962.5 were reviewed to identify documented releases of hazardous materials in soil and groundwater[3] within 0.25 mile (1,320 feet) of the project components, including the California State Water Resources Control Board (SWRCB) GeoTracker database and the California Department of Toxic Substances Control (DTSC) EnviroStor database. The relevant individual site documents are cited below. A 0.25-mile search radius from the project area was utilized to encompass the potential for migration of shallow groundwater contaminant plumes from typical leaking underground storage tank cases to adversely affect groundwater in the project area. Open environmental cases and their distance from project components are summarized in **Table 4.7-1** and shown on **Figures 4.7-1** and **4.7-2**. Leaking underground storage tank (LUST) sites that have been closed by the regulatory agency are not discussed because site closure indicates that the regulatory agency considers these sites to pose a low threat to human health and groundwater quality. The Fort Ord OU1 site was recently closed but is shown on Figure 4.7-1 for informational purposes. Some other closed sites located close to project components are also listed because they were closed some years ago and the older closure standards may result in residual contamination above current standards.

2 *Unexploded ordnance* refers to explosive weapons (bombs, bullets, shells, grenades, land mines, etc.) that did not explode when they were employed and still pose a risk of detonation, potentially many decades after they were used or discarded.

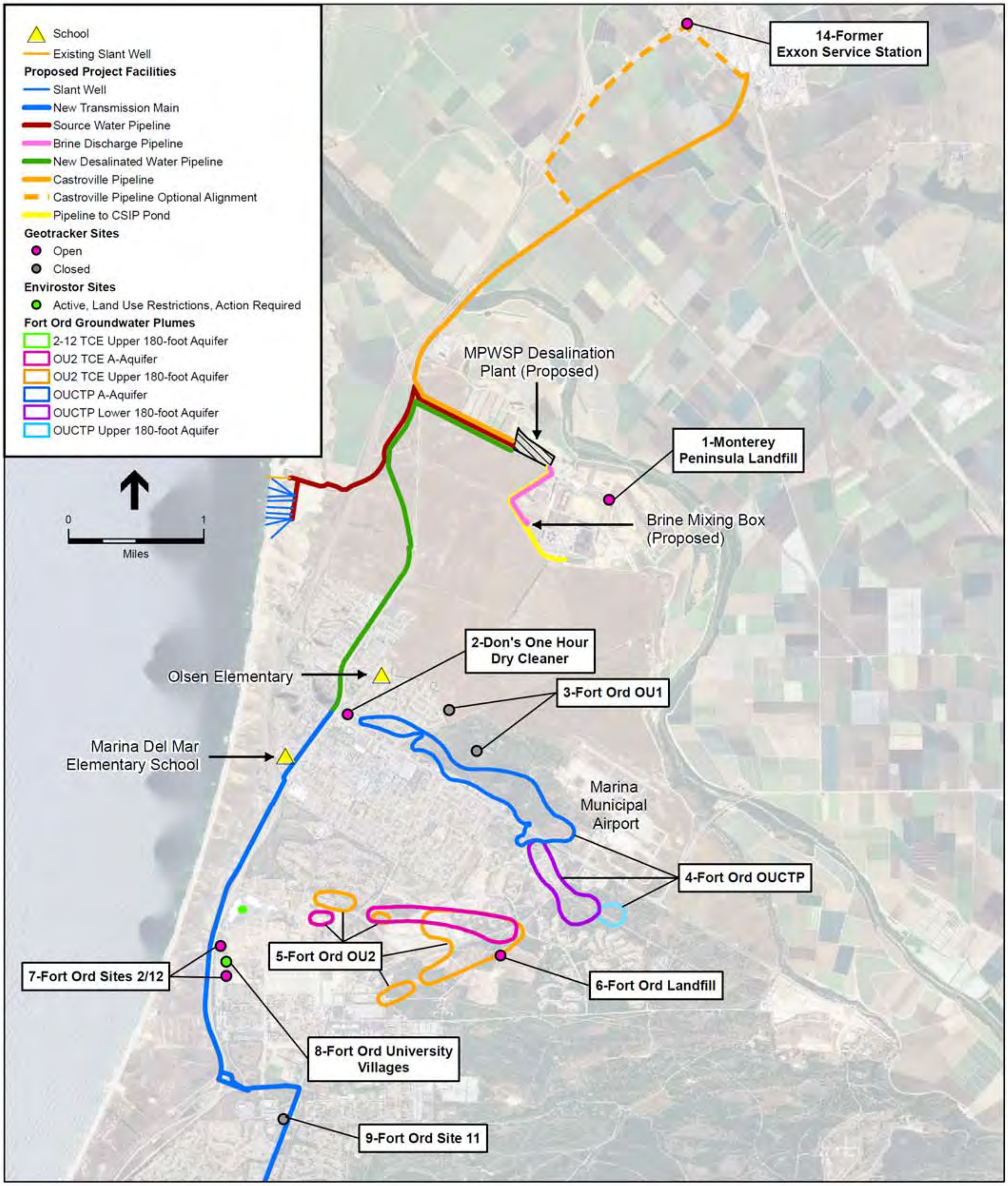
3 Unless listed in association with a documented release, it is assumed that facilities permitted to use, store, generate, or dispose of hazardous materials handle such materials in accordance with applicable laws and would not affect soil or groundwater in the project area.

TABLE 4.7-1
ENVIRONMENTAL CASES IDENTIFIED WITHIN 0.25 MILE OF THE PROJECT AREA

Map ID	Site Name/Address	Approximate Distance and Direction from Project Area	Status and Comments
1	Monterey Peninsula Class III Landfill	0.5 mile east of pipeline to CSIP Pond, Brine Discharge Pipeline, and Brine Mixing Box	Active – No environmental issues outside of landfill; does not underlie project components
2	Don's One Hour Dry Cleaners	530 feet east of new Desalinated Water Pipeline & new Transmission Main Pipeline	Active – Groundwater remediation in progress; does not underlie project components
3	Fort Ord OU1	0.9 mile east of new Desalinated Water Pipeline	Closed – Groundwater cleanup completed
4	Fort Ord OUCTP	1,100 feet east of new Desalinated Water Pipeline	Active – Groundwater remediation in progress; does not underlie project components
5	Fort Ord OU2	0.6 mile east of new Transmission Main Pipeline	Active – Groundwater remediation in progress; does not underlie project components
6	Fort Ord Sanitary Landfill	Two miles east of new Transmission Main Pipeline	Active – Groundwater remediation in progress; does not underlie project components
7	U.S. Army Fort Ord Sites 2 and 12	425 feet east of new Transmission Main Pipeline	Active – Groundwater remediation in progress; does not underlie project components
8	U.S. Army Fort Ord University Villages	800 feet east of new Transmission Main Pipeline	Active – Areas adjacent to Highway 1 have been remediated; does not underlie project components
9	Fort Ord Site 11	At staging area at northwest corner of General Jim Moore Blvd. & Gigling Road	Closed – Removed USTs and cleanup completed
10	Fort Ord Site 39 – Inland Ranges	0.5 mile east of ASR facilities	Closed – Cleanup complete along General Jim Moore Boulevard
11	Fort Ord Military Base Seaside Munitions Response Area	Within project area (ASR-5/ASR-6 wastewater infiltration area, southern part of new Transmission Main)	Closed – Cleanup complete along General Jim Moore Boulevard
12	Fort Ord Del Rey Oaks	0.8 mile north of Ryan Ranch-Bishop Interconnection Improvements	Closed in project area; still open inland – Cleanup complete along General Jim Moore Boulevard
13	Fort Ord York School Agreement	1,200 feet northeast of Ryan Ranch-Bishop Interconnection Improvements	Closed – Cleanup complete
14	Former Exxon Service Station	Adjacent to Castroville Pipeline Optional Alignment on northeast side of Merritt Street (Highway 183)	Active – Soil and groundwater remediation in progress

NOTE: Map ID numbers keyed to Figures 4.7-1 and 4.7-2.

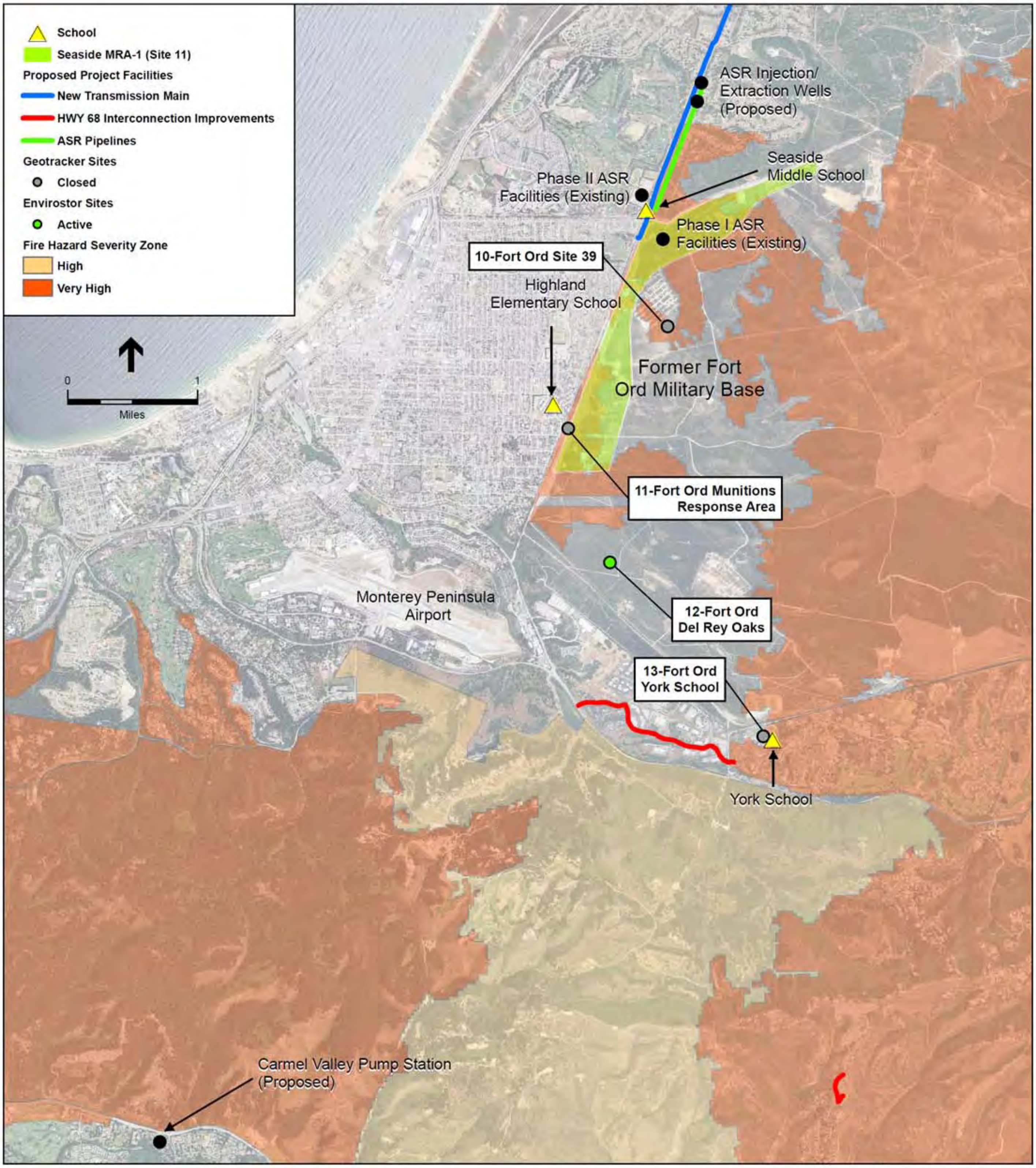
SOURCES: Ahtna, 2016a, 2016b, 2016c; FORA, 2015; FORA, 2016a, 2016b; FOSET, 2007; LFR et al, 2008, 2011; Regenesis, 2016; RMC Geoscience, 2016; RRM, 2016; RWQCB, 2016; U.S. Army, 1997, 2012; USEPA, 2016; West, 2007



SOURCE: ESRI, 2007; RMC Geoscience, 2016; RWQCB, 2016; Regenesis, 2016; Ahtna, 2016a, 2016b, 2016c; West, 2007; FORA, 2016b

205335.01 Monterey Peninsula Water Supply Project

Figure 4.7-1
Environmental Cases Near Project Components - Northern Portion



SOURCE: CAL FIRE, 2007; CAL FIRE 2008; DTSC, 2016; ESRI, 2013; USEPA, 2016; FORA, 2015; U.S. Army, 1997; Arcadis, 2016; Leidos, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.7-2

Environmental Cases Near Project Components - Southern Portion

Sites associated with past hazardous materials use and environmental cases identified during the regulatory agency database review that are considered to have a high potential to impact soil and/or groundwater in the project area based on remedial investigation findings, proximity to individual project component sites, and/or groundwater gradient (i.e., the site is upgradient from the project area with respect to the direction of groundwater flow) are discussed below with Map ID numbers keyed to Table 4.7-1, and Figures 4.7-1 and 4.7-2.

Monterey Peninsula Class III Landfill

Non-hazardous waste has been deposited since 1966 in both unlined and lined areas of the Monterey Peninsula Class III Landfill (**Map ID 1**) (RMC Geoscience, 2016). On-going monitoring includes groundwater, surface water, leachate, and landfill gas. Groundwater flow in the -2-Foot Aquifer is generally from the Salinas River toward the landfill (southwesterly), although flow direction reversals have occurred. The flow direction in the perched 35-Foot Aquifer generally flows to the northeast and produces a series of intermittent springs and seeps along the bluff face along the northeast side of the landfill. This water is managed using a series of subdrains and surface drains that discharge or drain to a storm water percolation pond. Trace detections of volatile organic compounds (VOCs) are occasionally detected in groundwater within the interior of the landfill but not at the perimeter detection monitoring wells.

Former Don's One Hour Dry Cleaners

Don's One Hour Dry Cleaners is a former dry cleaning operation that is undergoing remediation for dry cleaning solvents released to groundwater beneath the site (**Map ID 2**) (Regenesis, 2016). Groundwater was treated with a proprietary compound injected into groundwater to remediate perchlorothene (aka tetrachloroethene; PCE) and its degradation daughter products (trichloroethene, 1,2-dichloroethene, vinyl chloride). Injections of proprietary compounds to treat dry cleaning solvents is a common method accepted by regulatory agencies. Post-treatment monitoring indicates that only vinyl chloride is still present at a low concentration in one onsite well. Regenesis has proposed to conduct a follow-up injection to complete the site remediation.

Fort Ord Military Base Seaside Munitions Response Area Including Site 39 Inland Ranges and Former Fort Ord York School

From 1917 until its deactivation in 1994, the Fort Ord military base served as a training and staging facility for United States Army (U.S. Army) infantry troops. Industrial chemicals, and munitions and explosives of concern (MECs) have been detected in soil and groundwater at numerous locations across the former base. In 1990, the United States Environmental Protection Agency (USEPA) placed the military base on the National Priorities List, indicating that the Superfund cleanup process would be applied to the site. This action was taken primarily due to the presence of unexploded ordnance (UXO) on the surface and subsurface of the property (USEPA, 2016).

Investigations regarding the locations of MEC were initiated by the U.S. Army in 1993. These investigations resulted in the delineation of Munitions Response Areas (MRAs) that include approximately 12,000 acres of the former Fort Ord military base (U.S. Army, 2012). Smaller units, known as Munitions Response Sites (MRS), are defined within the MRA. Cleanup at the former Fort Ord military base is the responsibility of the U.S. Army, which is conducting ordnance cleanup for 8,000 acres. The U.S. Army has also entered into an Environmental Services Cooperative Agreement (ESCA) with the Fort Ord Reuse Authority (FORA) for MEC remediation and transfer of the remaining 3,340 acres (USEPA, 2016; FORA, 2015). These 3,340 acres, referred to as the Seaside MRA, will be available for redevelopment under a redevelopment plan adopted by FORA once remediation is complete. The Terminal Reservoir, and its inlet and outlet pipelines are proposed within the Seaside MRA (**Map ID 11** on **Figure 4.7-2**), specifically within the Munitions Response Site 1 (MRS-15 SEA 01), which is adjacent to and extends east of General Jim Moore Boulevard. The southern 700 feet of the new Transmission Main just south of Eucalyptus Boulevard/Coe Avenue is within MRS-15 SEA 03; however, the Transmission Main alignment would be within the west side of the previously cleared and constructed General Jim Moore Boulevard (FORA, 2017). The remaining pipeline alignments, the proposed ASR Pipelines, and the ASR-5 and ASR-6 Wells are not within delineated MRSs. The Inland Ranges (Site 39; **Map ID 10**) and the Del Rey Oaks site (**Map ID 12**) are located further inland and further away from all project components.

Beginning in 1997, the U.S. Army performed sampling and removal investigations on the four Seaside MRSs (MRS-15 SEA 01 through 04). During these investigations, 4,900 MEC items, 50,000 pounds of munitions debris, and 115,000 pounds of Army cultural debris were identified and removed from the MRSs (FORA, 2015). As of 2015, the MEC remediation field activities have been completed and the regulatory agencies have agreed that remediation is complete. Phase II investigations in the Seaside MRA took place initially for the roadway alignment and utility corridor along General Jim Moore Boulevard (LFR et al, 2008) and then subsequently for the areas outside the roadway alignment and utility corridor (LFR et al, 2011). Together, these actions resulted in removal of detected MEC to a depth of 4 feet, except in a few areas where anomalies were left in place because they were likely the result of existing infrastructure (e.g., transmission towers, culverts, fence posts, monitoring wells), and completed the Phase II removal action for the Seaside MRA (LFR et al, 2011).

The Findings of Suitability for Early Transfer (FOSET) agreement (FOSET, 2007) was established to restrict the use of the Seaside MRS parcels for any purposes other than investigation and remediation of MEC and installation of utilities (including water supply infrastructure) until site remediation activities were deemed complete by the responsible agencies. FORA will retain ownership of the Seaside MRS parcels until remediation is complete and the parcels are transferred to the City of Seaside. As of 2016, the remediation has been deemed complete and the parcels are ready for transfer. The Final Remedial Investigation Report for the Seaside MRA concluded that “assessment of the available literature, grid sampling and removal results, and equipment performance results indicate that the investigations and removal actions conducted in the Seaside MRA successfully detected, excavated, and recovered MEC items that may present an imminent safety hazard. It is possible, however, for residual MEC to remain undetected in the Seaside MRA” (FORA, 2017).

Documentation of the completed remediation activities and transfer of the property is anticipated to be complete by 2019 (FORA, 2016a). Until then, all ground-disturbing activity in this area requires a Right of Entry agreement with FORA and compliance with the Ordnance Remediation District Regulations of the City of Seaside.

The former Fort Ord York School also is within an inland range area that was investigated for the presence of MECs (U.S. Army, 1997). The Wilson Road portion of the Ryan Ranch Bishop Interconnection Improvements extends into this former range area (**Map ID 13**). Investigations of this local area did not identify any MECs and the property was cleared for transfer to the County of Monterey.

Former Fort Ord Groundwater Contamination Sites

In addition to hazards related to UXO and military munitions, groundwater in the aquifers located beneath the former Fort Ord military base is contaminated with volatile organic compounds (VOCs), mostly trichloroethene (TCE) and carbon tetrachloride (CT). Investigation and remediation of these contaminant plumes have been organized into operable units (OUs), as discussed below. These plumes have undergone investigation, source removal, and remedial action, including continued operation of groundwater treatment systems. The groundwater contamination plumes currently above action levels, and undergoing investigation and remediation are shown on **Figure 4.7-1**. The status of each plume is summarized below.

- **Fort Ord OU1 (Fritzsche Army Airfield Fire Drill Area; Onsite and Offsite Plumes) (Map ID 3):** The Fire Drill Area was established in 1962 as a training area for the Fort Ord Fire Department. This area consisted of an unlined burn pit, a drum loading area, a storage tank, and underground piping that connected the storage tank to a discharge nozzle. During training exercises, fuel was pumped into the burn pit, ignited, and then extinguished. Training activities ceased in 1985. These training activities are believed to have resulted in the release of contaminants to soil and groundwater. This site previously had VOCs in groundwater consisting mostly of TCE, perfluorooctanoic acid, and perfluorooctane sulfonate (RWQCB, 2016). The site has been remediated and chemical concentrations are below action levels. The site is awaiting documentation of formal closure.

- **Fort Ord OUCTP (Map ID 4):** The status of the OUCTP plume is documented in the *Fourth Quarter 2014 through Third Quarter 2015 Groundwater Monitoring Report* (Ahtna, 2016a). Carbon tetrachloride was apparently disposed of at a location near what is now Lexington Court (within the former Fort Ord) possibly sometime in the 1950s as part of various training and maintenance activities where carbon tetrachloride and other solvents were used. Carbon tetrachloride and other VOCs to a lesser extent entered the underlying A-Aquifer and migrated north along the western edge of a groundwater divide, then west-northwest parallel to Reservation Road. The A-Aquifer is being treated using enhanced in situ bioremediation, followed by monitored natural attenuation. This method involves enhancing naturally-occurring microbes to metabolize (break down) the contaminants to non-toxic compounds and does not require the extraction of groundwater.

  The carbon tetrachloride plume migrated downward into the Upper 180-Foot Aquifer through two known vertical conduits in the Fort Ord-Salinas Valley Aquitard (FO-SVA), creating two distinct parallel plumes. These vertical conduits (monitoring wells installed with inadequate sanitary seals) were decommissioned in 1999 and 2005. The two parallel plumes commingled and continued to migrate southeastward toward a natural vertical conduit (a discontinuity in the Intermediate 180-Foot Aquitard) south of monitoring well

MW-OU2-64-180. Since the decommissioning of the two monitoring wells, carbon tetrachloride concentrations in the southern Upper 180-Foot Aquifer plume have attenuated, and only the northern plume remains. The Upper 180-Foot Aquifer groundwater remedy has been in operation since September 2011 and includes one groundwater extraction well (EW-OU2-09-180) connected to the OU2 groundwater treatment system (GWTS) where extracted groundwater is treated with granular activated carbon (GAC).

Carbon tetrachloride migrated further downward into the Lower 180-Foot Aquifer likely through the same vertical conduit through which it entered the Upper 180-Foot Aquifer, and also through the natural hole in the 180-Foot Aquitard, creating two distinct plumes: one north and one south of Reservation Road. VOC concentrations associated with OUCTP in the Lower 180-Foot Aquifer south of Reservation Road are commingled with VOC concentrations associated with the OU2 plume. Monitored natural attenuation was implemented as the groundwater remedy for the Lower 180-Foot Aquifer in March 2011. Additionally, there is a contingency plan for treatment of groundwater (via granular activated carbon or air stripping) extracted from the Lower 180-Foot Aquifer by potable water supply wells at the well-head if chemicals associated with OUCTP are detected in these wells.

- **Fort Ord OU2 and Former Sanitary Landfill (Map IDs 5 and 6):** The status of the OU2 plume is documented in the *Fourth Quarter 2014 through Third Quarter 2015 Groundwater Monitoring and Treatment System Report* (Ahtna, 2016b). The former Fort Ord Landfills were active from 1955 to 1987 and were used for residential and on-base waste disposal typical of municipal landfills during that time. Waste was placed in parallel trenches 10 to 30 feet deep and then covered over with the native dune sand excavated during trenching operations. Detailed disposal records are not available; however, information gathered during field activities and from other sources indicates that household and on-base commercial refuse, dried sewage sludge, construction debris, and small amounts of chemical waste (such as paint, oil, pesticides, electrical equipment, ink, and epoxy adhesive) were placed in the Fort Ord Landfills. These activities led to release of contaminants to the underlying unconfined A-Aquifer. The OU2 plume, primarily consisting of TCE, migrated west to the edge of the FO-SVA where it migrated downward into the Upper 180-Foot Aquifer, then east, and then down into the Lower 180-Foot Aquifer through a natural discontinuity in the intermediate 180-Foot Aquitard. Low concentrations of chemicals associated with OU2 plume co-mingle in the Lower 180-Foot Aquifer with the OUCTP plume, discussed above. The groundwater treatment system consists of a groundwater pump and treatment system with twenty-five extraction wells, two injection wells and two infiltration galleries. Groundwater is treated using granular activated carbon and reinjected or recharged back into the aquifer.

- **Fort Ord Sites 2/12 (Map ID 7)**: The status of the Fort Ord Sites 2/12 plume is documented in *Sites 2 and 12 Fourth Quarter 2014 through Third Quarter 2015 Groundwater Monitoring and Soil Gas Monitoring and Treatment System Report* (Ahtna, 2016c). The groundwater aquifer of interest within Sites 2/12 is the unconfined Upper 180-Foot Aquifer. Depth to groundwater in the Upper 180-Foot Aquifer is between 45 and 260 feet below ground surface (bgs). Groundwater in the Upper 180-Foot Aquifer generally flows southwest. The original source of the chemical plume is assumed to be historical use and improper disposal of solvents in the Site 12 area. The Upper 180-Foot Aquifer chemical plume appears to have originated within Site 12 and was subsequently transported over 3,000 feet to the southwest by groundwater flow, passing beneath Highway 1 and into the Site 2 area. The Sites 2/12 groundwater plume is characterized by the presence of eight VOCs in groundwater at concentrations above their respective action levels: chloroform, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, total 1,3-dichloropropene, PCE, TCE, and vinyl chloride. TCE and PCE concentrations are used to define the extent of the groundwater plume in the Sites 2/12 area. VOCs are also present in soil gas in the vadose zone[4] above the groundwater. Soil gas is being remediated using soil gas extraction and treatment where the soil gas is pumped out of the ground and through granular activated carbon that captures the VOCs. Groundwater is being remediated using groundwater extraction and treatment where groundwater is pumped out of the ground and through granular activated carbon followed by secondary treatment by air stripper, both of which capture the VOCs. The treated water is then recharged back into the aquifer using two injection wells and three infiltration galleries.

Fort Ord University Villages

The US Army investigated pre-1978 structures to assess the potential presence of lead in soil from historical use of lead-based paint (West, 2007). The soil investigations revealed the presence of lead from lead-based paint in soil at various locations, including the Fort Ord University Villages, located just east of Highway 1 (**Map ID 8**). Soil with lead-based paint around former buildings was excavated and removed from the portions along Highway 1 where the new Transmission Main pipeline would be located.

Fort Ord Site 11

The USTs at the former Fort Ord fueling station were previously located in the southern portion of the current service station located on the west side of General Jim Moore Boulevard, just north of the northwest corner of General Jim Moore Boulevard and Gigling Road (**Map ID 9**) (FORA, 2016b). The previous USTs were removed and the site remediated prior to 1998. The site was subsequently rebuilt to the current service station configuration.

Former Exxon Service Station

A fuel service station formerly occupied the eastern corner of the intersection of Merritt Street (Highway 183), Haro Street, and the on and off ramps for Highway 156 (**Map ID 14**) (RRM, 2016). The underground storage tanks, contaminated soil, and buildings site have been removed, and the site is being remediated using air sparging and soil vapor extraction. The depth to groundwater ranged from about 24 to 33 feet below ground surface from 2009 to 2016. The Castroville Pipeline Optional Alignment would pass just west of and adjacent to this site.

4.7.1.2 Structural and Building Components

Hazardous materials, such as asbestos, lead, and polychlorinated biphenyls, may occur in older building materials and be released during demolition or renovation of existing facilities. Because the proposed project does not include demolition or renovation of existing facilities, buildings, or structures, hazardous materials in building debris would not be encountered and, therefore, are not discussed in detail in this section.

[4] The vadose zone is the unsaturated soil zone above the water table. Soil gas is located in the spaces between soil particles.

4.7.1.3 Existing Hazardous Materials Usage

Hazardous materials are currently used at the existing ASR injection/extraction wells (ASR-1, ASR-2, ASR-3, and ASR-4) and existing California American Water Company (CalAm) pump station sites. Operation of the ASR wells involves the storage and use of carbon dioxide, lime, sodium hypochlorite solution (bleach), and other substances required for water treatment. Existing CalAm pump stations are powered by electricity, but may store fuel for backup emergency generators, and minor amounts of solvents and lubricants for maintenance.

4.7.1.4 Nearby Airports

The new Desalinated Water Pipeline would be located 1.7 miles west of the Marina Municipal Airport, which is north of the intersection of Reservation Road and Imjin Road in Marina (see **Figure 4.7-1**). The new Transmission Main Pipeline would be located 0.3 miles north of the Monterey Peninsula Airport, which is east of Highway 1 and north of Highway 68 in Del Rey Oaks (see **Figure 4.7-2**).

4.7.1.5 Nearby Schools

Schools are considered sensitive receptors for hazardous materials because children are more susceptible than adults to the effects of hazardous materials. Schools that are located within 0.25 mile of the project are listed in **Table 4.7-2** and shown on **Figures 4.7-1** and **4.7-2**.

TABLE 4.7-2
SCHOOLS IN THE VICINITY OF PROJECT COMPONENTS

Project Component	Schools within 0.25 Mile of Project Components
New Desalinated Water Pipeline	• Olsen Elementary 261 Beach Road, Marina
New Transmission Main	• Marina Del Mar Elementary School 3066 Lake Drive, Marina • Seaside Middle School 999 Coe Avenue, Seaside
ASR Pipelines	Seaside Middle School 999 Coe Avenue, Seaside
Ryan Ranch-Bishop Interconnection Improvements	• York School 9501 York Rd, Monterey
Castroville Pipeline, Source Water Pipeline, and Brine Discharge Pipeline; Main System-Hidden Hills Interconnection Improvements; Carmel Valley Pump Station	None

SOURCE: MPUSD, 2016; NMCUSD, 2016.

4.7.1.6 Wildfire Hazards

California Department of Forestry and Fire Protection (CAL FIRE) maps identify fire hazard severity zones in state and local responsibility areas for fire protection. Portions of the southern project area are situated either within or near a Very High or High Fire Hazard Severity Zone (CAL FIRE, 2007, 2008). Project components located within and near these areas include the new Transmission Main, ASR Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station (see Figure 4.7-2).

4.7.2 Regulatory Framework

This section provides an overview of notable federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as "regulatory requirements") relevant to hazards and hazardous materials. A brief summary of each is provided, along with a finding regarding the project's conformity with those regulatory requirements. The conformity findings concern the project as proposed, without mitigation. Where the project, as proposed, would be consistent with the applicable regulatory requirement, no further discussion of project consistency with that regulatory requirement is provided. Where the project, as proposed, would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to a specific impact topic within EIR/EIS Section 4.7.5, Direct and Indirect Effects of the Proposed Project, where the potential inconsistency is addressed in more detail. Where applicable, the discussion in Section 4.7.5 includes identification of feasible mitigation that would resolve or minimize the potential inconsistency.

4.7.2.1 Federal Regulations

Comprehensive Environmental Response, Compensation, and Liability Act, Superfund Amendments and Reauthorization Act of 1986 (42 USC Section 9601 et seq.)

The Comprehensive Environmental Response, Compensation, and Liability Act, also known as CERCLA, created the federal Superfund program that provides for the response and cleanup of hazardous substances that may endanger public health or the environment. The Superfund Amendments and Reauthorization Act (SARA) amended CERCLA in 1986 to increase state involvement and required Superfund actions to consider state environmental laws and regulations. SARA also established a regulatory program for the Emergency Planning and Community Right-to-Know Act. The applicable part of SARA for the MPWSP is Title III, otherwise known as the Emergency Planning and Community Right-To-Know Act of 1986. Title III requires states to establish a process for developing local chemical emergency preparedness programs and to receive and disseminate information on hazardous substances present at facilities in local communities. The law provides primarily for planning, reporting, and notification concerning hazardous substances. Key provisions require notification when extremely hazardous substances are present above their threshold planning quantities, immediate notification to the local emergency planning committee and the state emergency response commission when a hazardous material is released in excess of its reportable quantity, and that material safety data sheets for all hazardous materials or a list of all hazardous materials be submitted to the state and local emergency planning agencies and local fire department. Contractors during construction activities and CalAm during operations would be required to prepare Hazardous Materials Business Plans, as required under the state Hazardous Materials Release Response Plans and Inventory Act, described below, which would make the proposed project consistent with CERCLA as amended by SARA.

The cleanup projects being conducted at the former Fort Ord, described above in Section 4.7.1 Setting/Affected Environment, are being conducted under CERCLA. If the MPWSP were to adversely affect the ongoing cleanup activities, CalAm may be considered a potentially responsible party as defined in CERCLA.

Toxic Substances Control Act (15 USC 2605)/Resource Conservation and Recovery Act (42 USC 6901 et seq.)/Hazardous and Solid Waste Act

The federal Toxic Substances Control Act of 1976 and the Resource Conservation and Recovery Act of 1976 authorized the USEPA to regulate the generation, transportation, treatment, storage, and disposal of hazardous waste. The Resource Conservation and Recovery Act was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the "cradle to grave" system of regulating hazardous wastes. Contractors would be required to comply with state regulations including the Hazardous Materials Release Response Plans and Inventory Act, Unified Hazardous Waste and Hazardous Materials Management Regulatory Program, License to Transport Hazardous Materials, and Hazardous Materials Storage and Handling, which would make the proposed project consistent with the Toxic Substances Control Act.

U.S. Department of Transportation Hazardous Materials Transport Act (49 USC 5101)

The U.S. Department of Transportation, in conjunction with the USEPA, is responsible for enforcement and implementation of federal laws and regulations pertaining to transportation of hazardous materials. The Hazardous Materials Transportation Act of 1974 directs the U.S. Department of Transportation to establish criteria and regulations regarding the safe storage and transportation of hazardous materials. 49 CFR 171–180, regulates the transportation of hazardous materials, types of material defined as hazardous, and the marking of vehicles transporting hazardous materials. Contractors would be required to comply with state regulations including the Hazardous Materials Release Response Plans and Inventory Act, Unified Hazardous Waste and Hazardous Materials Management Regulatory Program, License to Transport Hazardous Materials, and Hazardous Materials Storage and Handling, which would make the proposed project consistent with the U.S. Department of Transportation Hazardous Materials Transport Act.

Occupational Safety and Health Act (29 USC 15)

The Occupational Safety and Health Act of 1970 was passed to address employee safety in the workplace. The Act created the Occupational Safety and Health Administration (OSHA), whose mission is to ensure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health. The OSHA staff establishes and enforces protective standards and reaches out to employers and employees through technical assistance and consultation programs. Contractors would be required to comply with California OSHA regulations, described below, which would make the proposed project consistent with the federal OSHA.

4.7.2.2 State Regulations

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) provides for the long-term management of lands within California's coastal zone boundary. Of primary relevance to hazards and hazardous materials is a Coastal Act policy concerning oil and hazardous substance spills. A preliminary assessment of project consistency with this priority is provided here. Final determinations regarding project consistency are reserved for the Coastal Commission. The MPWSP would be required to prepare a Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan and comply with the California Fire Code, both of which would provide procedures to store hazardous materials and respond to accidents. With implementation of this required plan, the project would be consistent with Coastal Act policy concerning oil and hazardous substance spills.

Safe Drinking Water and Toxics Enforcement Act, Proposition 65 - Health and Safety Code, Section 25249.5 et seq.

This law identifies chemicals that cause cancer and reproductive toxicity, provides information for the public, and prevents discharge of the chemicals into sources of drinking water. Lists of the chemicals of concern are published and updated periodically. Businesses are required to notify Californians about the chemicals in products they purchase, in the workplace, or that are released to the environment. By providing this information, individuals are able to make informed decisions about protecting themselves from exposure to these chemicals. Contractors would be required to comply with state regulations including the Hazardous Materials Release Response Plans and Inventory Act, Unified Hazardous Waste and Hazardous Materials Management Regulatory Program, and Hazardous Materials Storage and Handling, which would make the proposed project consistent with the state Safe Drinking Water and Toxics Enforcement Act.

Aboveground Petroleum Storage Act - Health and Safety Code, Section 25270

Health and Safety Code Sections 25270 to 25270.13 ensure compliance with the federal Clean Water Act. The law applies to facilities that operate a petroleum aboveground storage tank with a capacity greater than 660 gallons or combined aboveground storage tanks capacity greater than 1,320 gallons or oil-filled equipment where there is a reasonable possibility that the tank(s) or equipment may discharge oil in "harmful quantities" into navigable waters or adjoining shore lands. If a facility falls under these criteria, it must prepare a Spill Prevention Control and Countermeasure Plan which would make the proposed project consistent with the Aboveground Petroleum Storage Act.

Hazardous Materials Release Response Plans and Inventory Act - Health and Safety Code, Section 25500 et seq.

The Hazardous Materials Release Response Plans and Inventory Act of 1985, also known as the Business Plan Act, requires businesses using hazardous materials to prepare a Hazardous Materials Business Plan that describes their facilities, inventories, emergency response plans, and training programs. Business plans contain basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed. This Act and the related regulations in Title 19 of the California Code of Regulations (CCR) Section 2620, et seq., require local governments to regulate local business storage of hazardous materials in excess of certain quantities. The law also requires that entities storing hazardous materials be prepared to respond to releases. Those using and storing hazardous materials are required to submit a Hazardous Materials Business Plan (HMBP) to their local Certified Unified Program Agency (CUPA) and to report releases to their CUPA and the State Office of Emergency Services. The California Office of Emergency Services is responsible for implementing the accident prevention and emergency response programs established under the Act and its implementing regulations. Contractors would be required to prepare and submit Hazardous Materials Business Plans, which would make the proposed project consistent with the Hazardous Materials Release Response Plans and Inventory Act.

Hazardous Waste Control Act – Health and Safety Code, Section 25100 et seq.

The Hazardous Waste Control Act of 1972 created the State hazardous waste management program, which is similar to but more stringent than the federal Resource Conservation and Recovery Act program. The Act is implemented by regulations contained in Title 26 of the CCR,[5] which describes the following required aspects for the proper management of hazardous waste: identification and classification; generation and transportation; design and permitting of recycling treatment, storage and disposal facilities; operation of facilities and staff training; and closure of facilities and liability requirements. These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under the Hazardous Waste Control Act and its implementing regulations in Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with the DTSC. Contractors would be required to comply with the Hazardous Waste Control Act, which would make the proposed project consistent.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) – Health and Safety Code Sections 25404 et seq.

This program requires the administrative consolidation of six hazardous materials and waste programs (Program Elements) under one agency, a CUPA. The following Program Elements are consolidated under the Unified Program:

- Hazardous Waste Generator and On-site Hazardous Waste Treatment Programs (a.k.a. Tiered Permitting)
- Aboveground Petroleum Storage Tanks
- Hazardous Materials Release Response Plans and Inventory Program (a.k.a. Hazardous Materials Disclosure or “Community-Right-To-Know”)

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[5] Title 26 is a compilation of all environmental and hazardous waste regulations issued by state regulatory agencies published in a single title of the California Administrative Code. These toxics regulations are also found in the original titles assigned to each agency, and are repeated in Title 22 and in Title 23.

- California Accidental Release Prevention Program
- UST Program
- Uniform Fire Code Plans and Inventory Requirements

The Unified Program is intended to provide relief to businesses complying with the overlapping and sometimes conflicting requirements of formerly independently managed programs. The Unified Program is implemented at the local government level by CUPAs. Most CUPAs have been established as a function of a local environmental health or fire department. The local CUPA for this project is the Monterey County Environmental Health Division. Some CUPAs have contractual agreements with another local agency, a participating agency, which implements one or more Program Elements in coordination with the CUPA. Contractors would be required to comply with the Unified Hazardous Waste and Hazardous Materials Management Regulatory Program, which would make the proposed project consistent.

California Occupational Safety and Health Act – California Labor Code, Section 6300 et seq.

The California Occupational Safety and Health Act of 1973 addresses California employee working conditions, enables the enforcement of workplace standards, and provides for advancements in the field of occupational health and safety. The Act also created the California Occupational Safety and Health Administration (Cal OSHA), the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. Cal OSHA's standards are generally more stringent than federal regulations. Under the former, the employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings. All contractors are required to comply with Cal OSHA, which would make the proposed project consistent.

License to Transport Hazardous Materials – California Vehicle Code, Section 32000.5 et seq.

A valid Hazardous Materials Transportation License, issued by the California Highway Patrol, is required by the State of California Vehicle Code Section 32000.5 for transportation of hazardous materials shipments for which the display of placards is required by State regulations; or hazardous materials shipments of more than 500 pounds.

Additional requirements on the transportation of explosives, inhalation hazards, and radioactive materials are enforced by the California Highway Patrol under the authority of the State Vehicle Code Sections 32100 – 33002. Transportation of explosives generally requires consistency with additional rules and regulations for routing, safe stopping distances, and inspection stops (Title 14, CCR, Chapter 6, Article 1, Sections 1150-1152.10). Inhalation hazards face similar, more restrictive rules and regulations (Title 13, CCR, Chapter 6, Article 2.5, Sections 1157-1157.8). Contractors that transport hazardous materials are required to acquire the license for and comply with the requirements of the License to Transport Hazardous Materials regulations, which would make the proposed project consistent.

Water Main Separation – California Code of Regulations, Title 22, Section 64572

California Code of Regulations, Title 22, Section 64572 states that new water mains and supply lines shall not be within the same trench as, and must be located least 10 feet horizontally from, any parallel pipeline conveying sewage, secondary-treated recycled water, and hazardous fluids such as fuels, industrial wastes, and wastewater sludge. In addition, new water mains may not be installed within 100 horizontal feet of any sanitary landfill, wastewater disposal pond, or hazardous waste disposal site, or within 25 horizontal fee of the nearest edge of any cesspool, septic tank, sewage leach field, underground hazardous material storage tank, or groundwater recharge site. None of the proposed project's pipelines will be co-located with sewer lines; contractors are required to comply with the water main separation regulations, which would make the proposed project consistent.

Utility Notification Requirements – California Code of Regulations, Title 8, Section 1541

Title 8 CCR Section1541 requires excavators to determine the approximate locations of subsurface installations, such as sewer, telephone, fuel, electric, and water lines (or any other subsurface installations that may reasonably be encountered during excavation work) prior to opening an excavation. The California Government Code (Section 4216 et seq.) requires owners and operators of underground utilities to become members of and participate in a regional notification center. According to Section 4216.1, operators of subsurface installations who are members of, participate in, and share in the costs of a regional notification center, such as Underground Services Alert, are in compliance with this section of the code. Underground Services Alert (known as USA North 811) receives planned excavation reports from public and private excavators and transmits those reports to all participating members of USA North that may have underground facilities at the location of excavation. Members will mark or stake their facilities, provide information, or give clearance to dig (USA North, 2016). Contractors are required to comply with the Utility Notification Requirements, which would make the proposed project consistent.

Prohibited Activities in Forests, Forestry and Range and Forage Lands – California Public Resources Code, Section 4411 et seq.

The California Public Resources Code (PRC) restricts the use of internal combustion engines in forest-, brush-, and grass-covered lands; specifies requirements for the safe use of gasoline-powered tools in fire hazard areas; and specifies fire suppression equipment that must be provided onsite for various types of work in fire-prone areas. More specifically, the PRC requires the following:

- Earthmoving and portable equipment with internal combustion engines must be equipped with a spark arrestor[6] to reduce the potential for igniting a wildland fire (PRC Section 4442).

[6] A spark arrestor is a device that prohibits exhaust gases from an internal combustion engine from passing through the impeller blades where they could cause a spark. A carbon trap is commonly used to retain carbon particles from the exhaust.

- Appropriate fire suppression equipment must be maintained during the highest fire danger period—from April 1 to December 1 (PRC Section 4428).
- On days when a burning permit is required, flammable materials must be removed to a distance of 10 feet from any equipment that could produce a spark, fire, or flame, and the construction contractor must maintain the appropriate fire suppression equipment (PRC Section 4427).
- On days when a burning permit is required, use of portable tools powered by gasoline-fueled internal combustion engines are prohibited within 25 feet of any flammable materials (PRC Section 4431).

Contractors would be required to comply with state restrictions regarding the use of internal combustion engines in forest-, brush-, and grass-covered lands, which would make the proposed project consistent.

Hazardous Materials Storage and Handling, California Fire Code, California Code of Regulations, Title 24, Part 9, Section 2700 et seq.

The California Fire Code (Chapter 27) includes specific requirements for the safe storage and handling of hazardous materials. These requirements reduce the potential for a release of hazardous materials and for mixing of incompatible chemicals, and specify the following specific design features to reduce the potential for a release of hazardous materials that could affect public health or the environment:

- Separation of incompatible materials with a noncombustible partition, or appropriate distance separation.
- Spill control in all storage, handling, and dispensing areas.
- Separate secondary containment for each chemical storage system. The secondary containment must hold the entire contents of the tank, plus the volume of water needed to supply the fire suppression system for a period of 20 minutes in the event of a catastrophic spill.

The California Fire Code (Chapter 14) also addresses fire safety during construction and demolition and includes requirements for smoking, waste disposal, cutting and welding, fire protection equipment, fire reporting, access for firefighting. Contractors would be required to comply with the Hazardous Materials Storage and Handling regulations, which would make the proposed project consistent.

Screening Levels for Hazardous Materials in Soil or Groundwater

The RWQCB Environmental Screening Levels (ESLs) are guidelines used to evaluate the potential risk associated with chemicals found in soil or groundwater where a release of hazardous materials has occurred. The RWQCB has established ESLs for both residential and commercial/industrial land uses, and for construction workers. Residential screening levels are the most restrictive; soil with chemical concentrations below these levels generally would not require remediation and would be suitable for unrestricted uses if disposed of offsite.

Commercial/industrial screening levels are generally less restrictive than residential screening levels because they are based on potential worker exposure to hazardous materials in the soil (and these are generally less than residential exposures). Screening levels for construction workers are also less restrictive than for commercial/industrial workers because construction workers are only exposed to the chemical of concern during the duration of construction, while industrial workers are assumed to be exposed over a working lifetime.

The California Environmental Project Agency (Cal/EPA) has also developed screening levels for human exposure to potentially hazardous chemicals. The California Human Health Screening Levels (CHHSLs) are concentrations of 54 hazardous chemicals in soil or soil gas that Cal/EPA considers to be below thresholds of concern for risks to human health. The CHHSLs can be used to screen sites for potential human health concerns where releases of hazardous chemicals have occurred. The presence of a chemical at concentrations in excess of a CHHSL does not indicate that adverse impacts are occurring or will occur, but suggests that further evaluation is warranted. The CHHSLs are guidance, and not regulatory cleanup standards. The proposed project could be inconsistent with soil or groundwater screening levels for hazardous materials if the screening levels were not applied during soil excavation activities. This is addressed below in Impact 4.7-2.

4.7.2.3 Local Regulations

Table 4.7-3 describes the regional and local land use plans, policies, and regulations pertaining to hazards and hazardous materials that are relevant to the MPWSP and that were adopted for the purpose of avoiding or mitigating an environmental effect. Also included in Table 4.7-3 is an analysis of project consistency with such plans, policies, and regulations. Where the analysis concludes the proposed project would not conflict with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes the proposed project may conflict with the applicable plan, policy, or regulation, the reader is referred to Section 4.7.5, Direct and Indirect Effects of the Proposed Project, for additional discussion. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

TABLE 4.7-3
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO HAZARDS AND HAZARDOUS MATERIALS

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone)	City of Marina Local Coastal Program Land Use Plan	Policies	Subsurface Slant Wells, Source Water Pipeline, New Desalinated Water Pipeline, and New Transmission Main	***Policy 20:*** The policy of the City of Marina shall be: To seek assistance and direction in protecting Marina's beach resources from destruction by oil spills and other hazardous substances.	The intent of this policy is to protect beach resources from the damaging effects of hazardous material releases.	Consistent: The project would be required to prepare a Hazardous Materials Business Plan and comply with the California Fire Code, both of which would provide procedures to store hazardous materials and respond to accidents.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface Slant Wells, Source Water Pipeline, New Desalinated Water Pipeline, and New Transmission Main	***Policy 4.103:*** To protect the public from heath threats posed by hazardous materials, the following policies shall be adhered to: 1. The City shall support all local, regional and state efforts directed at preventing injuries and avoiding environmental contamination due to the uncontrolled release of hazardous substances. The City shall follow all applicable regulations and procedures related to the use, storage and transportation of toxic, explosive and other hazardous materials to prevent uncontrolled discharges. 2. The City shall require discretionary review and approval of all commercial and industrial uses which will generate more than 27 gallons of hazardous wastes monthly (the limitation imposed by Monterey Regional Waste Management District for non-household hazardous wastes). City approval of these uses shall be contingent upon preparation and approval by the County Health Department of a hazardous-waste-disposal plan for these uses prepared in accordance with the requirements of the Monterey County Health Department. 3. All uses involving the handling of significant amounts of hazardous materials shall be subject to discretionary approval. Hazardous materials management and disposal plans shall be prepared in accordance with the requirements of the Monterey County Health Department for all such projects prior to the granting of any entitlements by the City. The City shall ensure that proposed industrial or commercial projects that will use or generate hazardous materials shall be compatible with surrounding uses as designated by the General Plan. Residential uses and other sensitive uses such as schools shall be adequately buffered from adjoining uses which involve the use or generation of hazardous materials.	This policy is intended to protect the public and the environment from health risks associated with the use, storage, transport, and uncontrolled release of hazardous materials.	Consistent: The project would be required to prepare a Hazardous Materials Business Plan and comply with the California Fire Code, both of which would provide procedures to store hazardous materials and respond to accidents.
City of Marina (coastal zone and inland areas)	Marina Municipal Code	Chapter 15.56 - Digging and Excavation the Former Fort Ord	Subsurface Slant Wells Source Water Pipeline, New Desalinated Water Pipeline, and New Transmission Main	***Chapter 15.56 - Digging and Excavation the Former Fort Ord*** establishes special standards and procedures for digging and excavation on those properties in the former Fort Ord which are suspected of containing ordnance and explosives. This ordinance requires that a permit be obtained from the City for any excavation, digging, development or ground disturbance of any type involving the displacement of ten cubic yards or more of soil. The permit requirements include providing each site worker a copy of the notice; complying with all requirements placed on the property by the Army and DTSC; obtaining ordnance and explosives construction support; ceasing soil disturbance activities upon discovery of suspected ordnance, and reporting of project findings.	This section of municipal code is intended to protect the public, workers, and the environment from uncontrolled detonation of ordnance.	Consistent: Some of the project components would result in excavation in areas within the Former Fort Ord. Although cleanup activities have removed known contamination, previously-unknown contamination may be discovered. This issue is addressed in **Impact 4.7-2**, which requires compliance with relevant regulations**.**
City of Marina (coastal zone and inland areas)	Marina Municipal Code	Chapter 8.12 – Hazardous Materials Storage and Registration	Subsurface Slant Wells, Source Water Pipeline, New Desalinated Water Pipeline, and New Transmission Main	***Section 8.12.050: Hazardous materials registration form.*** Any person who owns or operates an establishment that contains at any one time during the year, hazardous materials as defined in Section 8.12.020 shall file a completed hazardous material registration form with the health department within ninety days of the effective date of this chapter (1983).	This policy is intended to protect the public and the environment from health risks associated with uncontrolled releases of hazardous materials.	Consistent: There would be no facilities within the City of Marina that store hazardous materials.
City of Monterey (inland areas)	Monterey City Code	Chapter 13 – Fire Protection	Ryan Ranch-Bishop Interconnection Improvements	***Chapter 13:*** Defines standards for fire protection, hazardous substances clean up, and the establishment of fire hazard severity zones within the City of Monterey. The City of Monterey has adopted the 2013 California Fire Code, with amendments. The Fire Chief may require that fire hydrants be installed on private property if the Chief determines that development of the property creates an additional fire hazard that cannot be adequately served by publicly maintained fire hydrants.	The intent of this city code is to protect the public and the environment from fire hazards and uncontrolled hazardous material releases.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and comply with the California Fire Code, all of which would provide procedures to store hazardous materials and respond to accidents.
City of Monterey (inland areas)	Monterey City Code	Chapter 9 – Building Regulations	Ryan Ranch-Bishop Interconnection Improvements	***Chapter 9, Article 8:*** Contains digging and excavation standards that apply to land once part of the former Fort Ord, including prohibition of digging, excavation, and development of this land until ordnance or explosive remediation is completed.	This policy is intended to protect the public, workers, and the environment from uncontrolled detonation of ordnance.	Potentially Inconsistent: Some of the project components would result in excavation in areas within the Former Fort Ord. Although cleanup activities have removed known contamination, previously-unknown contamination may be discovered. This issue is addressed in **Impact 4.7-2**.

TABLE 4.7-3 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO HAZARDS AND HAZARDOUS MATERIALS

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Safety	New Transmission Main, ASR Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Policy S-2.2:*** Minimize the risk to community associated with hazardous materials.	The intent of this policy is to protect the public and the environment from health risks associated with hazardous materials.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan, and comply with the California Fire Code, all of which would provide procedures to store hazardous materials and respond to accidents.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Safety	New Transmission Main, ASR Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Implementation Plan S-2.2.1:*** Hazardous Materials. Minimize public health risk and environmental risks from the use, transport, storage, and disposal of hazardous materials by: • Cooperating with federal, State, and County agencies to effectively regulate the management of hazardous materials and hazardous waste, especially on the former Fort Ord; • Cooperating with the County of Monterey to reduce the per capita production of household hazardous waste in accordance with the County Hazardous Waste Management Plan; • Identifying roadway transportation routes for conveyance of hazardous materials (the City does not exercise jurisdiction over transportation of freight along railroad right-of-way or state highways); • Implementing a Multihazard Emergency Plan for accidents involving hazardous materials; and • Cooperating with the Certified Unified Program Agency (CUPA) for Seaside (the County of Monterey, Environmental Health Division) and the Seaside Fire Department to administer Risk Management Plans for businesses within the City.	This plan is intended to protect the public and the environment from health risks associated with the use, storage, transport, and uncontrolled release of hazardous materials.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan, and comply with the California Fire Code, all of which would provide procedures to store hazardous materials and respond to accidents.
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 15.34 - Digging and Excavation the Former Fort Ord	New Transmission Main, ASR Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Chapter 15.34: Digging and Excavation the Former Fort Ord*** contains the "Ordnance Remediation District Regulations of the City" (Ord. 924 (part)) and establishes special standards and procedures for digging and excavation on those properties in the former Fort Ord military base which are suspected of containing ordnance and explosives. This ordinance requires that a permit be obtained from the City for any excavation, digging, development, or ground disturbance of any type involving the displacement of ten cubic yards or more of soil. The permit requirements include providing each site worker a copy of the Ordnance and Explosives Safety Alert; complying with all requirements placed on the property by an agreement between the City, FORA, and DTSC; obtaining ordnance and explosives construction support; ceasing soil disturbance activities upon discovery of suspected ordnance and notifying the Seaside Police department, the Presidio law enforcement, the Army and DTSC; coordinating appropriate response actions with the Army and DTSC; and reporting of project findings.	The intent of this code is to protect the public, workers, and the environment from health risks associated with uncontrolled ordnance detonation.	Potentially Inconsistent: Some of the project components would result in excavation in areas within the Former Fort Ord. Although cleanup activities have removed known contamination, previously-unknown contamination may be discovered. This issue is addressed in **Impact 4.7-2**.
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 8.50 – Hazardous Materials Registration	New Transmission Main, ASR Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Chapter 8.50: Hazardous Materials Registration*** requires that any person who owns or operates an establishment that contains hazardous materials any time during the year file a completed hazardous material registration form with the department of health. This form must be updated annually to ensure that the City has current information regarding hazardous substances and materials being used in the city.	This policy is intended to protect the public and the environment from health risks associated with the use, storage, transport, and uncontrolled release of hazardous materials.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan, and comply with the California Fire Code, all of which would provide procedures to store hazardous materials and respond to accidents.
County of Monterey (coastal zone)	North County Land Use Plan	2.3 Environmentally Sensitive Habitats	Source Water Pipeline and New Desalinated Water Pipeline	***2.3.3.B.8*** Oil and other toxic substances shall not be allowed to enter or drain into the estuarine system. Oil spill and toxic substance discharge contingency plans shall be developed by the appropriate agencies of Monterey County to coordinate emergency procedure for clean-up operations of all foreseeable conditions. New development shall be permitted adjacent to estuarine areas only where such development does not increase the hazard of oil spill or toxic discharge into the estuaries.	This policy is intended to protect estuaries from the unintended release of hazardous substances.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan, and comply with the California Fire Code, all of which would provide procedures to store hazardous materials and respond to accidents.
County of Monterey (coastal zone)	North County Land Use Plan	2.8 Hazards	Source Water Pipeline and New Desalinated Water Pipeline	***2.8.2 (1):*** All development shall be sited and designed to minimize risk from geologic, flood, tsunami or fire hazards to a level generally acceptable to the community. Areas of a parcel which are subject to high hazard(s) shall generally be considered unsuitable for development. Any proposed development in high hazard areas shall require the preparation of an environmental or geotechnical report prior to County review of the project.	This policy is intended to protect the public and property from natural hazards.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and comply with the California Fire Code, which would provide procedures to store hazardous materials, reduce fire hazards, and respond to accidents. Geologic and flood hazards are addressed in Section 4.2, Geology, Soils, and Seismicity.

TABLE 4.7-3 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO HAZARDS AND HAZARDOUS MATERIALS

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 10.65 – Hazardous Materials Registration	Source Water Pipeline, MPWSP Desalination Plant, New Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Carmel Valley Pump Station Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Chapter 10.65: Hazardous Materials Registration*** requires that any person who owns or operates an establishment that contains hazardous materials at any one time during the year file a completed hazardous materials registration form to the Department of Health. An updated completed hazardous material form must be submitted to the Department of Health annually.	The intent of this policy is to protect the public and the environment from health risks associated with the use, storage, transport, and uncontrolled release of hazardous materials.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan, and comply with the California Fire Code, all of which would provide procedures to store hazardous materials and respond to accidents.
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 10.67 - Hazardous Materials Emergency Response	Source Water Pipeline, MPWSP Desalination Plant, New Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Carmel Valley Pump Station Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Chapter 10.67: Hazardous Materials Emergency Response*** establishes a surcharge that applies to businesses that use, store, or otherwise handle hazardous materials. The surcharge funds current or future Fire Hazardous Material Emergency Response Teams that would respond to threats to life, property, or natural resources arising from the use, storage, or handling of hazardous materials by these businesses.	This code is intended to protect public health and the environment from risks associated with the uncontrolled release of hazardous materials from businesses that use, store, or handle these substances.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan, and comply with the California Fire Code, all of which would provide procedures to store hazardous materials and respond to accidents.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	MPWSP Desalination Plant Carmel Valley Pump Station	***Policy S-4.11:*** The County shall require all new development to be provided with automatic fire protection systems (such as fire breaks, fire-retardant building materials, automatic fire sprinkler systems, and/or water storage tanks) approved by the fire jurisdiction.	This policy is intended to protect the public and the environment from fire hazards associated with New development.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and comply with the California Fire Code, which would provide procedures to store hazardous materials, reduce fire hazards, and respond to accidents.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	MPWSP Desalination Plant	***Policy S-4.13:*** The County shall require all new development to have adequate water available for fire suppression. The water system shall comply with Monterey County Code Chapter 18.56, NFPA Standard 1142, or other nationally recognized standard. The fire authority having jurisdiction, the County Departments of Planning and Building Services, and all other regulatory agencies shall determine the adequacy and location of water supply and/or storage to be provided.	The intent of this policy is to ensure that New development would be served by water supplies adequate to protect the public and the environment from fire hazards.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and comply with the California Fire Code, which would provide procedures to store hazardous materials, reduce fire hazards, and respond to accidents.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, New Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Carmel Valley Pump Station Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-4.14:*** Water systems constructed, extended, or modified to serve a new land use or a change in land use or an intensification of land use, shall be designed to meet peak daily demand and recommended fire flow.	This policy is intended to ensure that water utility systems have capacity to protect the public and the environment from fire hazards associated with changes in land use within the County.	Consistent: As described in the Description of the Proposed Project, the purpose of this project is to replace public water supply that would be constrained by the state Cease and Desist Order limitations to the use of Carmel River water.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, New Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Carmel Valley Pump Station Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-4.21:*** All permits for residential, commercial, and industrial structural development (not including accessory uses) shall incorporate requirements of the fire authority having jurisdiction.	The intent of this policy is to protect the public and the environment from fire hazards.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the California Fire Code.

TABLE 4.7-3 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO HAZARDS AND HAZARDOUS MATERIALS

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, New Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Carmel Valley Pump Station Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-4.22:*** Every building, structure, and/or development shall be constructed to meet the minimum requirements specified in the current adopted state building code, state fire code, Monterey County Code Chapter 18.56, and other nationally recognized standards.	This policy is intended to protect the public and the environment from hazards associated with structures, including fire hazards and seismic hazards.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the California Fire Code. Compliance with the California Building Code is addressed in Section 4.2, Geology, Soils, and Seismicity.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Carmel Valley Pump Station Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-4.26***: When public facilities and above-ground utilities are located in high or very high fire hazard areas, special precautions shall be taken to mitigate the risks from wildfire and to ensure uninterrupted operation.	This policy is intended to protect the public, the environment, and utility systems from wildfire hazards.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the California Fire Code, which would reduce fire hazards.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Carmel Valley Pump Station Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-4.31:*** A zone that can inhibit the spread of wildland fire shall be required of New development in fire hazard areas. Such zones shall consider irrigated greenbelts, streets, and/or Fuel Modification Zones in addition to other suitable methods that may be used to protect development. The County shall not preclude or discourage a landowner from modifying fuel within the Fuel Modification Zone, or accept any open space easement or other easement over land within a Fuel Modification Zone that would have that effect.	The intent of this policy is to protect people and structures from risk of loss, injury, or death associated with wildland fires.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the California Fire Code, which would reduce fire hazards.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Carmel Valley Pump Station Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-4.32:*** Property owners in high, very high, and extreme fire hazard areas shall prepare an overall Fuel Modification Zone plan in conjunction with permits for new structures, subject to approval and to be performed in conjunction with the CDFFP and/or other fire protection agencies in compliance with State Law.	The intent of this policy is to protect people and structures from risk of loss, injury, or death associated with wildland fires.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the California Fire Code, which would reduce fire hazards.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Safety	New Transmission Main, ASR Conveyance Pipelines, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Hazardous and Toxic Materials Safety Policy C-1:*** The City of Seaside shall require hazardous materials management and disposal plans for any future projects involving the use of hazardous materials.	This policy is intended to protect the public and the environment from health risks associated with the use, storage, transport, and uncontrolled release of hazardous materials.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan that would provide procedures to store, manage, and dispose of hazardous materials.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Safety	Ryan Ranch–Bishop Interconnection Improvements	***Hazardous and Toxic Materials Safety Policy C-1:*** The County of Monterey shall require hazardous materials management and disposal plans for any future projects involving the use of hazardous materials.	This policy is intended to protect the public and the environment from health risks associated with the use, storage, transport, and uncontrolled release of hazardous materials.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan, and comply with the California Fire Code, all of which would provide procedures to store hazardous materials and respond to accidents.

SOURCES: City of Marina, 2006, 2013; City of Seaside, 2004; FORA, 1997; Monterey County, 1999, 2010

4.7.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to hazards and hazardous materials if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school;
- Be located on a site, which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment;
- Be located within an area covered by an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, and would result in a safety hazard for people residing or working in the project area;
- Be located within the vicinity of a private airstrip and would result in a safety hazard for people residing or working in the project area;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Based on the nature of the proposed project, there would be no impacts related to the following criteria for the reasons described below:

- ***Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school during operations.*** The project components that would be located within 0.25 mile of a school would be underground pipelines. There would be no storage or use of hazardous materials associated with the pipelines; therefore, no release of hazardous emissions would occur within 0.25 mile of a school during operations.
- ***Be located within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the project area.*** The proposed project would not be located within the vicinity of a private airstrip; therefore, no safety hazard would result from project implementation.
- ***Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.*** The Monterey County Emergency Operations Plan provides an overview of agency roles and responsibilities during emergencies (Monterey County Office of Emergency Services, 2011). The proposed project would not interfere with the designated agency responsibilities and reporting in the event of an emergency

because no roads would be completely closed, and some work activities would not occur on public roads.

- ***Increase risk of wildland fire during operations.*** Operation of the proposed project would not introduce potentially flammable activities in fire-prone areas. Project components that would be located within high fire hazard areas consist of underground water pipelines. Operation of the Carmel Valley Pump Station, which is located just south of an area of high fire hazard, could require temporary and intermittent use of a diesel-powered generator that would be stored onsite. This backup generator would be installed in accordance with applicable NFPA standards and other requirements for generators, and its operation would not be expected to increase wildfire risk. Accordingly, there would be no increased risk of wildland fire hazards.

4.7.4 Approach to Analysis

Hazards and hazardous materials information for the project area was derived from various sources and compiled in this chapter to develop a comprehensive understanding of the potential constraints and hazards associated with project construction and operations. Information sources include findings resulting from regulatory agency database searches, review of hazardous materials investigation reports, site reconnaissance, applicable regulations and guidelines, and proposed project construction and operations. Significant impacts would occur if the location or activities of project components resulted in conflicts with known hazardous materials sites.

As described in more detail below, the analysis of hazards and hazardous materials impacts in this section takes into account the various existing federal, state, and local regulations that apply to hazards and hazardous materials. Through compliance with the existing regulations, CalAm would be required to use, transport, store, and dispose of hazardous materials using procedures that would avoid hazards or reduce the potential for hazardous materials incidents.

4.7.5 Direct and Indirect Effects of the Proposed Project

Table 4.7-4 summarizes the proposed project's impacts and significance determinations related to hazards and hazardous materials.

TABLE 4.7-4
SUMMARY OF IMPACTS – HAZARDS AND HAZARDOUS MATERIALS

Impacts	Significance Determinations
Impact 4.7-1: Create a significant hazard to the public or the environment through the routine transport, use, disposal, or accidental release of hazardous materials during construction.	LS
Impact 4.7-2: Encountering hazardous materials from other hazardous materials release sites during construction.	LSM
Impact 4.7-3: Project facilities would be located on a known hazardous materials site.	LS
Impact 4.7-4: Handle hazardous materials or emit hazardous emissions within 0.25 mile of a school during construction.	LS
Impact 4.7-5: Increased risk of wildland fires during construction.	LS

TABLE 4.7-4 (Continued)
SUMMARY OF IMPACTS – HAZARDS AND HAZARDOUS MATERIALS

Impacts	Significance Determinations
Impact 4.7-6: Create a significant hazard to the public or the environment through the routine transport, use, disposal, or accidental release of hazardous materials during project operations.	LS
Impact 4.7-C: Cumulative impacts related to hazards and hazardous materials.	LSM

NOTES:
LS = Less than Significant impact, no mitigation proposed
LSM = Less than Significant impact with Mitigation

4.7.5.1 Construction Impacts

Impact 4.7-1: Create a significant hazard to the public or the environment through the routine transport, use, disposal, or accidental release of hazardous materials during construction. (*Less than Significant*)

All Project Components

Petroleum products, such as gasoline, diesel fuel, lubricants, and cleaning solvents would be utilized to fuel and maintain construction vehicles and equipment for all project components. As discussed in Section 3.3.2.1, the proposed slant wells would be drilled using mud rotary drilling techniques. Drilling fluids, such as bentonite mud, would be used to drill through the shallow dry dune sands to prevent loose dry sand from locking up the drill bit inside the conductor casing. Once the drill bit reaches groundwater, the construction contractor would pump out all of the sand-bentonite mud slurry and put it in a storage container for offsite hauling and disposal. Below the top of the groundwater table, only the water already present in the sand, and possibly additional potable water, would be used to circulate the drill cuttings. As discussed in Section 3.3.2.2, Wells ASR-5 and ASR-6 would be installed using a reverse rotary drilling technique. Bentonite drilling fluids would not be used during ASR well drilling; however, non-corrosive, environmentally inert, biodegradable additives might be used to keep the borehole open, as discussed in Section 4.4, Groundwater Resources. The well drilling methods would not use pressurized drilling techniques, and frac-out events are not anticipated. The routine use or reasonably foreseeable upset and accident conditions could result in inadvertent releases of small quantities of hazardous materials, which could adversely affect construction workers, soil, and surface water. Neither of the drilling methods would use fracking techniques or the chemicals used in fracking.[7]

Construction activities are required to comply with numerous hazardous materials and stormwater regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety, and to reduce the potential for a release of construction-related fuels or other hazardous materials to affect stormwater and downstream receiving water bodies (see Section 4.7.2, Regulatory Framework). The HMBP would require that

[7] Hydraulic fracturing (also fracking, hydrofracturing or hydrofracking) is a well-stimulation technique in which rock is fractured by a pressurized liquid.

hazardous materials used for construction are stored in appropriate containers, with secondary containment to contain a potential release. The California Fire Code would require measures for the safe storage and handling of hazardous materials. As discussed in Section 4.3, Surface Water Hydrology and Water Quality, the construction contractor would be required to prepare a Stormwater Pollution Prevention Plan (SWPPP) for construction activities according to the National Pollutant Discharge Elimination System (NPDES) General Construction Permit requirements. The SWPPP would list the hazardous materials (including petroleum products) proposed for use during construction and describe spill prevention measures, equipment inspections, equipment and fuel storage, and protocols for responding immediately to spills. In addition, the drilling operations would not be conducted using pressure methods and would only use water or non-corrosive, environmentally inert, biodegradable additives.

Impact Conclusion

Through compliance with applicable hazardous materials storage, disposal, and stormwater permitting regulations, hazardous materials impacts associated with potential releases from the routine transport, use, or disposal of hazardous materials or the accidental release of hazardous materials during construction would be less than significant for all project components.

Mitigation Measures

None proposed.

Impact 4.7-2: Encountering hazardous materials from other hazardous materials release sites during construction. (*Less than Significant with Mitigation*)

All Pipelines and Conveyance Facilities

The proposed project involves excavation, trenching, and grading for the construction of water conveyance pipelines, building footings, and utilities. As identified in **Table 4.7-1**, some sites with known soil and/or groundwater contamination are located within 0.25 mile of project facilities and may have affected subsurface conditions at various locations along the project area. In addition, although previous site cleanup activities have remediated known contamination at some sites, it is still possible that undiscovered contamination may be present, given the land use history in the project area. The contaminants anticipated to be encountered during project construction activities include petroleum hydrocarbons, VOCs, PAHs, and metals from gasoline service stations, and dry cleaners. Construction activities conducted within the former Fort Ord military base, a National Priorities List site, could result in exposure to UXO, which is discussed separately under Impact 4.7-3, below. Soil disturbance during construction could further disperse existing contamination into the environment and expose construction workers and the public to contaminants. If substantial hazardous materials are present in excavated soils, health and safety risks to workers and the public could occur. Such risks could occur from stockpiling, handling, or transportation of soils that have been contaminated by hazardous materials from previous spills or leaks. The dewatering of contaminated groundwater could also present risks to public health and safety, and the environment, if the contaminated groundwater (i.e., dewatering effluent) is not handled properly. The potential for contaminated soil and groundwater to be released into the environment during project construction would be considered a significant impact.

Impacts resulting from the potential release of or exposure to hazardous materials in soil or groundwater would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.7-2a (Health and Safety Plan)** and **4.7-2b (Soil and Groundwater Management Plan)**. **Mitigation Measure 4.7-2a** would require that construction contractors prepare a health and safety plan in accordance with Cal OSHA regulations. The plan would specify personal protective equipment for workers, outline construction measures to reduce the potential for workers' exposures to hazardous materials in soil and groundwater, and describe procedures for handling accidental hazardous materials releases and unanticipated contamination. **Mitigation Measure 4.7-2b** requires construction contractors to comply with all relevant environmental regulations and plan appropriately for the safe and lawful handling and disposal of excavated soil and groundwater, when encountered. With implementation of **Mitigation Measures 4.7-2a** and **4.7-2b**, the potential for harmful exposure to hazardous materials present in soil or groundwater during pipeline and other conveyance facility construction would be reduced to a less-than-significant level.

All Other Project Components

Although hazardous materials sites are not currently identified in proximity to other proposed project components, newly discovered sites may arise prior to the time of construction that could affect subsurface conditions in the project area. Encountering unanticipated soil or groundwater contamination could result in potential exposures to construction workers, the public, or the environment, resulting in a significant impact. However, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.7-2a** and **4.7-2b**.

Consistency with Plans & Policies

As discussed above, the construction of the project has the potential to discover previously unknown contamination from previous land uses. This would be inconsistent with the City of Marina's Chapter 15.56; and the City of Monterey's Chapter 9, Article 8, as discussed above in Table 4.7-3. The construction of the project would be made consistent with the implementation of **Mitigation Measures 4.7-2a** and **4.7-2b**, and through compliance with applicable hazardous materials laws and regulations.

Impact Conclusion

There is a potential to encounter contaminated soil and/or groundwater during construction of all proposed project components. Thus, the potential for contaminated soil and groundwater to be released into the environment during project construction is considered a significant impact for all project components. However, with implementation of **Mitigation Measures 4.7-2a (Health and Safety Plan)** and **4.7-2b (Soil and Groundwater Management Plan)**, and through compliance with applicable hazardous materials laws and regulations, the potential for exposure to hazardous materials in soil and groundwater during construction would be reduced to a less-than-significant level and the MPWSP would be brought into conformance with the above-noted policies.

Mitigation Measures

Mitigation Measure 4.7-2a applies to all project components.

Mitigation Measure 4.7-2a: Health and Safety Plan.

The construction contractor(s) shall prepare and implement a site-specific Health and Safety Plan as required by and in accordance with 29 CFR 1910.120 to protect construction workers and the public during all excavation and grading activities. This plan shall be submitted to the California Public Utilities Commission for review prior to commencement of construction. The Health and Safety Plan shall include, but is not limited to, the following elements:

- Designation of a trained, experienced site safety and health supervisor who has the responsibility and authority to develop and implement the site health and safety plan;
- A summary of all potential risks to construction workers and maximum exposure limits for all known and reasonably foreseeable site chemicals;
- Specified personal protective equipment and decontamination procedures, if needed;
- Emergency procedures, including route to the nearest hospital; and
- Procedures to be followed in the event that evidence of potential soil or groundwater contamination (such as soil staining, noxious odors, debris or buried storage containers) is encountered. These procedures shall be in accordance with hazardous waste operations regulations and specifically include, but are not limited to, the following: immediately stopping work in the vicinity of the unknown hazardous materials release, notifying Monterey County Department of Environmental Health, and retaining a qualified environmental firm to perform sampling and remediation.

Mitigation Measure 4.7-2b applies to all project components.

Mitigation Measure 4.7-2b: Soil and Groundwater Management Plan.

In support of the Health and Safety Plan described above, CalAm or its contractor shall develop and implement a Soil and Groundwater Management Plan that includes a materials disposal plan specifying how the construction contractor will remove, handle, transport, and dispose of all excavated material in a safe, appropriate, and lawful manner. The plan must identify protocols for soil testing and disposal, identify the approved disposal site, and include written documentation that the disposal site will accept the waste. Contract specifications shall mandate full compliance with all applicable local, state, and federal regulations related to the identification, transportation, and disposal of hazardous materials, including those encountered in excavated soil or dewatering effluent.

As part of the Soil and Groundwater Management Plan, CalAm or its contractor shall develop a groundwater dewatering control and disposal plan specifying how contaminated groundwater (dewatering effluent), if encountered, will be handled and disposed of in a safe, appropriate and lawful manner. The plan must identify the locations at which groundwater dewatering is likely to be required, the method to analyze groundwater for hazardous materials, and the appropriate treatment and/or disposal methods. If the dewatering effluent contains contaminants that exceed the requirements of the *General WDRs for Discharges with a Low Threat to Water Quality* (Order No. R3-2011-0223, NPDES Permit No. CAG993001), the construction contractor shall contain the dewatering effluent in a portable holding tank for appropriate offsite disposal or discharge (see Section 4.5.3 in Section 4.3, Surface Water Hydrology and Water Quality, for more information regarding this NPDES permit). The contractor can either dispose of the contaminated effluent at a permitted waste management facility or discharge the effluent, under permit, to a publicly owned treatment works such as the MRWPCA Regional Wastewater Treatment Plant. This plan shall be submitted to the California Public Utilities Commission and Monterey Bay National Marine Sanctuary for review and approval prior to commencement of construction.

Impact 4.7-3: Project facilities would be located on a known hazardous materials site. (*Less than Significant*)

Portions of New Transmission Main

As discussed above in Section 4.7.1.1, Soil and Groundwater Conditions, the southern 700 feet of the new Transmission Main would be located in the former Fort Ord Seaside MRA. This is a known former hazardous materials site and is identified on the National Priorities List. However, the pipeline alignment would be entirely with General Jim Moore Boulevard, a previously disturbed area (roadway construction) and cleared of UXO by the U.S. Army (FORA, 2017). Although the U.S. Army has conducted UXO investigation and removal in this area, the U.S. Army also states that undetected UXO may still be present. Construction activities within this area have the potential to encounter undiscovered UXO, which, if not identified and properly handled, could cause injury to or death of construction workers.

As discussed in the setting section, above, the investigations and remedial actions conducted for the Seaside MRSs are complete within the footprint of the project components. However, specific regulations still apply to any ground-disturbing activities within these areas, including the City of Seaside's Ordnance Remediation District regulations and the environmental protection provisions of the FOSET agreement. Prior to construction within the southernmost portion of the new Transmission Main, the applicant or its contractor would need to obtain a Right of Entry agreement from FORA and obtain a permit for digging and excavation from the City of Seaside. As part of the permit application, CalAm or its contractors would be required to provide proposed project plans, a technical summary of ordnance removal activities performed on the property in the past (see FORA, 2017), a soils management plan, a UXO support workplan, an oversight reimbursement agreement, and confirmation of DTSC approval. Compliance with the City of Seaside digging and excavation permit and FORA Right of Entry requirements would ensure that all personnel authorized to access the former Fort Ord Seaside MRAs receive MEC recognition training, coordinate with a qualified Ordnance and Explosive Safety Specialist during all activities on the site, and comply with all requirements placed on the property by an agreement between the City of Seaside, FORA, and DTSC. All permits require ceasing soil disturbance activities and notification to the Seaside Police Department, the Presidio law enforcement, the

U.S. Army, and DTSC of any suspected UXO immediately upon discovery. Compliance with the foregoing regulations for construction work at the former Fort Ord military base would ensure the potential impact of encountering UXO during project construction would be less than significant.

All Other Project Components

None of the other project components would be located on known hazardous materials sites. Therefore, no impact associated with the siting of these facilities on a known hazardous materials site would occur. The potential for contaminated soil or groundwater from nearby hazardous materials sites to migrate into the project area and then be encountered during project construction is addressed above under Impact 4.7-2.

Impact Conclusion

Portions of the New Transmission Main within the Seaside MRA would be located on a known hazardous materials site. However, with compliance with the above-described regulations, the project would ensure the impact is less than significant. None of the other project components are located within a known hazardous materials site.

Mitigation Measures

None proposed.

Impact 4.7-4: Handle hazardous materials or emit hazardous emissions within 0.25 mile of a school during construction. (*Less than Significant*)

New Desalinated Water Pipeline, new Transmission Main, ASR Pipelines, and Ryan Ranch-Bishop Interconnection Improvements

These project components would be located within 0.25 mile of a school. As discussed above under Impact 4.7-1, project construction could require the use of small quantities of fuel, lubricants, paints, and solvents.

The hazardous materials storage and stormwater permitting requirements discussed under Impact 4.7-1, above, impose performance standards on the construction activities that would ensure the risk of release of hazardous materials during construction would be low. Therefore, the potential for a hazardous materials release during construction to result in increased exposure to hazardous materials at the nearby schools (see Figure 4.7-1 and 4.7-2) is remote; therefore, this impact is less than significant.

Hazardous air emissions are toxic air contaminants identified by the California Air Resources Board. Construction would result in the short-term emissions of diesel particulate matter (DPM), a toxic air contaminant, within 0.25 mile of schools. However, based on a screening-level analysis discussed in Section 4.10, Air Quality, DPM emissions would be less than the Monterey Bay Unified Air Pollution Control District's increased cancer risk threshold. Thus, this would be a less-than-significant impact.

All Other Project Components

None of the other proposed project components are located within 0.25-mile of a school. No impact would result.

Impact Conclusion

The new Desalinated Water Pipeline, new Transmission Main, ASR Pipelines, and Ryan Ranch-Bishop Interconnection Improvements Pipeline would result in a less-than-significant impact from the handling of hazardous materials within 0.25 mile of schools during construction.

Mitigation Measures

None proposed.

Impact 4.7-5: Increased risk of wildland fires during construction. (*Less than Significant*)

New Transmission Main, ASR Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station

As illustrated in **Figure 4.7-2**, the new Transmission Main, ASR Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station are proposed in or near areas classified by CAL FIRE as High or Very High Fire Hazard Severity Zones.

California regulations governing the use of construction equipment in fire prone areas are designed to minimize the risk of wildland fires during construction activity (e.g., PRC Sections 4411 et seq.). These regulations restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors on construction equipment that has an internal combustion engine; specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and specify fire suppression equipment that must be provided onsite for various types of work in fire prone areas. In addition, the California Fire Code addresses the fire safety of general construction operations. The construction contractor must comply with these regulations and any additional requirements imposed by CAL FIRE or the local fire protection departments. With compliance, the impact associated with an increased risk of wildland fires during construction of the Highway 68 interconnection improvements and the Carmel Valley Pump Station would be less than significant.

Further, as noted above under Impact 4.7-3, portions of the New Transmission Main and ASR Pipelines are located in an area with the potential for undiscovered UXO. This area is also a Very High Fire Hazard Severity Zone as shown on Figure 4.7-2. Explosions of ordnance could result in wildfires that could be severe. As described under Impact 4.7-3, compliance with permit requirements from the City of Seaside would ensure that if UXO is encountered, it is safely handled, reducing the risk of wildfire caused by accidental detonation of UXO to a level that is less than significant.

All Other Proposed Facilities

None of the other project facilities are located within or near an area classified by CAL FIRE as a High or Very High Fire Hazard Severity Zone; however, construction activities could temporarily increase fire risk. With compliance with California Fire Code regulations for construction, the potential impact associated with an increased risk of fire during construction of all other project components would be less than significant.

Impact Conclusion

The proposed project would result in a less-than-significant impact from potential increased fire risk during construction.

Mitigation Measures

None proposed.

4.7.5.2 Operational and Facility Siting Impacts

Impact 4.7-6: Create a significant hazard to the public or the environment through the routine transport, use, disposal, or accidental release of hazardous materials during project operations. (*Less than Significant*)

Project components that would involve the storage and use of hazardous materials are discussed below.

Subsurface Slant Wells

Periodic maintenance of the subsurface slant wells would be required every 5 years. Maintenance workers would lower mechanical brushes into the slant wells to mechanically clean the screens. If chemical cleaning products are needed for maintenance, only environmentally inert products would be used.

Access to and the use of cleaning equipment for well maintenance would require the use of the same types of vehicles and equipment used during construction. Similar to construction, petroleum products, such as gasoline, diesel fuel, lubricants, and cleaning solvents could be utilized to fuel and maintain maintenance vehicles and equipment. The routine use or reasonably foreseeable upset and accident conditions could result in inadvertent releases of small quantities of these hazardous materials into soil and surface water. However, compliance with the various regulations regarding the safe transport, use, and storage of hazardous materials (see Section 4.7.2, Regulatory Framework) as well as the NPDES General Construction Permit requirements would ensure this impact is less than significant, similar to as discussed above in Impact 4.7-1. The SWPPP would identify the hazardous materials to be used during slant well maintenance and would describe spill prevention measures, equipment inspection requirements, equipment and fuel storage, and spill response protocols. No mitigation measures are proposed.

MPWSP Desalination Plant

The operation of the MPWSP Desalination Plant is discussed in Section 3.2.2., The desalination process would use chemicals during the pretreatment of the seawater, the post treatment of the desalination water and for cleaning the membranes; they are listed in Table 4.7-5 and include sodium hypochlorite, sodium bisulfite, sodium hydroxide, zinc orthophosphate, strong bases or acids, carbon dioxide, lime, sodium hydroxide, and flocculating agents.

The MPWSP Desalination Plant operations would involve the use and storage of chemicals to remove performance-reducing deposits from the pretreatment filtration system and reverse osmosis (RO) membranes, as well as chemicals to adjust product water quality. The types and amounts of chemicals that would be utilized in the MPWSP Desalination Plant treatment processes are listed in **Table 4.7-5**.

TABLE 4.7-5
MPWSP DESALINATION PLANT (9.6 MGD) – WATER TREATMENT CHEMICALS

Chemical	Application	Approximate Chemical Usage (pounds/year)
Sodium Hypochlorite	Pretreatment / Post-treatment	140,000 / 55,000
Sodium Bisulfite	Pretreated source water	85,000
Carbon Dioxide	Post-treatment	420,000
Lime	Post-treatment	960,000
Sodium Hydroxide	Post-treatment	55,000
Orthophosphate	Post-treatment	30,000
RO Cleaning Chemicals (various)	RO membrane cleaning	To be determined
Coagulant (if needed)	Pretreatment	To be determined

SOURCE: RBF Consulting, 2013; CalAm, 2014.

Pretreatment Process. As discussed in Section 3.2.2 of Chapter 3, Description of the Proposed Project, source water would be pretreated using pressure filters or multimedia gravity filters to remove suspended solids, microbes, and other contaminants such as iron and manganese. Routine backwashing of the pretreatment filters would occur each day. Backwashing the pretreatment filters would require that a chlorine solution (sodium hypochlorite, similar to bleach) be added to the backwash water supply to control bacterial growth on the filters. If data collected during the pilot program indicates that a chemical coagulant (e.g., ferric chloride, a commonly used coagulant) is needed in the pretreatment process, the backwash effluent would be treated to remove the coagulant chemical prior to discharge. Waste effluent produced during backwashing would flow by gravity from the pretreatment filters to two 0.25-acre, 6-foot-deep lined backwash settling basins. Suspended solids in the waste effluent would settle to the bottom of the basins, and the clarified water would be decanted. Approximately 0.4 million gallons per day (mgd) of decanted backwash water may be pumped to the Brine Discharge Pipeline, blended with brine produced by the RO system in the Brine Mixing Box, and discharged to the existing MRWPCA ocean outfall. Alternatively, the decanted backwash water could be blended with source water before undergoing pretreatment and the RO process. Sludge formed by the solids in the backwash effluent would be periodically removed from the backwash settling basin and disposed of at a sanitary landfill.

RO System. The RO system would remove salts and other minerals from the seawater. The RO membranes would be cleaned to remove the accumulation of silts or scale, which reduces membrane performance. The RO system is expected to require cleaning two to three times per year. The RO membranes would be cleaned by circulating a cleaning solution (comprised of strong bases or acids) through the membranes and then flushing the membranes with clean water to remove the spent cleaning solution and waste effluent from the RO system. The spent cleaning solution and waste effluent would be discharged into a collection sump, chemically neutralized, then pumped into tank trucks and transported to an offsite disposal site.

Desalination Plant Post-Treatment Process. Desalinated water would be disinfected and treated with chemicals to adjust alkalinity and hardness. The primary disinfectant is a solution of sodium hypochlorite.

Bulk storage of these chemicals would be located in various 5,000- to 10,000-gallon tanks with secondary containment located within the process and electrical building. The capacity of the chemical storage tanks would vary by chemical. The design of the process and electrical building would incorporate all regulatory requirements for hazardous materials storage, such as spill containment features that exceed the capacity of the tanks; segregation of individual chemicals to prevent mixing in the case of accidental spillage; and appropriate alarm and fire sprinklers. Chemicals that have specific reactivity risks with one another will be stored at opposite ends of the storage area to reduce the potential risk of mixing. Lime and carbon dioxide would be used for post-treatment. In addition, a 750-kilowatt (KW) emergency diesel-gas powered generator and 2,000-gallon double-walled, aboveground diesel storage tank would be installed adjacent to the process and electrical building for emergency backup.

CalAm would be required to implement the project in accordance with all applicable laws and regulations governing hazardous materials storage, handling, and disposal. These regulations are designed to protect worker safety, provide for the safe storage and use of hazardous materials, reduce the potential for accidental releases, track and clean up accidental releases, and ensure that hazardous wastes are disposed of appropriately. A summary of these laws and regulations is provided in Section 4.7.2, Regulatory Framework. For example, California Fire Code, Article 80, requires all chemical storage and handling systems be designed and constructed to ensure the safe storage and handling of hazardous materials. Some of the requirements specifically applicable to the proposed project include spill control in all storage, handling and dispensing areas, separate secondary containment for each chemical storage system, and separation of incompatible materials with a non-combustible partition. These requirements reduce the potential for a release of hazardous materials and for mixing of incompatible materials that could pose a risk to workers, the public, and the environment.

As required by law, CalAm would submit a HMBP for the proposed project to the Monterey County Environmental Health Division prior to the start of project operations. The HMBP is required to include information on hazardous material handling and storage, including containment, site layout, and emergency response and notification procedures in the event of a spill or release. In addition, the plan requires annual employee health and safety training. The plan must be approved by the County prior to commencement of project construction and the proposed project would be subject to post-construction compliance inspections. The HMBP would also provide the local agencies with the information they need to plan appropriately for a chemical release, fire, or other incident, which would reduce the potential for an accidental release to cause harmful health effects to workers or the public or substantial degradation to soil or water quality.

Transportation and disposal of wastes, such as spent cleaning solutions, would also be subject to regulations for the safe handling, transportation, and disposal such as the California Labor Code, Section 6300 et seq., California Vehicle Code Sections 32000 et seq., and Health and Safety Code, Sections 25100 et seq. Transporters licensed to haul hazardous wastes are required to meet requirements for training, secondary containment, and placarding to reduce the potential for a release of hazardous materials during transport to disposal facilities. Compliance with these various regulations would ensure this impact is less than significant. No mitigation measures are proposed.

ASR-5 and ASR-6 Wells

Water recovered from the two proposed ASR injection/extraction wells would be chlorinated using sodium hypochlorite for disinfection prior to being conveyed into the distribution system. The existing disinfection system has sufficient capacity to treat ASR product water extracted from all six ASR injection/extraction wells (e.g., the four existing ASR injection/extraction wells [ASR-1, ASR-2, ASR-3, and ASR-4] and the two new wells [ASR-5 and ASR-6] proposed under the MPWSP). The disinfection chemicals for the proposed ASR-5 and ASR-6 wells would be stored at the existing chemical/electrical control building at the Phase I ASR facilities site. The existing disinfection system includes a 5,000-gallon sodium hypochlorite tank with double containment, vent fume neutralizers, and a forced-air ventilation system. The proposed project would increase the annual quantity of sodium hypochlorite handled by the disinfection system, but the amount stored on-site would be the same. Sodium hypochlorite solution (12.5 percent NaOCl) would be delivered to the existing ASR disinfection facility by tanker trucks approximately once per month to replenish the system. With all six wells in operation, the expected chemical use would be less than 150 gallons per day of sodium hypochlorite.

Additional chemicals of concern are generated from the injection of chlorinated water into a groundwater aquifer. This process is known to result in the formation of disinfection byproducts (DBPs) including trihalomethanes (THMs) and haloacetic acids (HAAs) from reactions with organic matter present in the aquifer. Studies regarding the fate and stability of DBPs injected into the groundwater aquifer at the MPWMD Santa Margarita Test Injection Well (Pueblo Water Resources, 2013) indicate that THMs appear to increase during the first 60 days of storage, then decline slowly over the following 90 to 150 days to below initial injection levels. According to the studies, HAAs declined steadily during aquifer storage, reaching non-detectable levels within 90 days. Groundwater extracted for drinking water supply would be required to meet drinking water requirements. The DBP data collected during the 2012 water year show that THMs were below regulatory limits for drinking water. Refer to Section 4.4, Groundwater Resources, for further discussion of groundwater quality.

With compliance with applicable regulations, the potential impact resulting from an accidental release of hazardous materials used during operation the ASR-5 and ASR-6 Wells would be less than significant.

Carmel Valley Pump Station

A portable 50 kW portable diesel-powered generator would be stored at the Carmel Valley Pump Station to provide backup power in the event of a power outage. The generator would be operated in compliance with all hazardous materials regulations. Therefore, the potential impact related to release of hazardous materials during operation of the Carmel Valley Pump Station would be less than significant.

All Other Proposed Facilities

Operation of all pipelines, Ryan Ranch-Bishop Interconnection Improvements, and the Main System-Hidden Hills Interconnection Improvements would not involve the routine storage or use of hazardous materials. No impact related to the inadvertent release of hazardous materials during operation of these project components would result.

Impact Conclusion

Through compliance with existing state and federal laws and regulations regarding hazardous materials storage and management, the potential for environmental impacts due to the accidental release of hazardous materials associated with project operations would be less than significant.

Mitigation Measures

None proposed.

4.7.6 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects. As discussed in Section 4.7.3, above, the project would have no impact with respect to the use of hazardous materials within 0.25 mile of a school (during operations), the location of project components within 2 miles of an airport, interference with an adopted emergency response plan or emergency evacuation plan, or wildland fire hazards (during operations). Accordingly, the proposed project could not contribute to cumulative impacts related to these topics.

Impact 4.7-C: Cumulative impacts related to hazards and hazardous materials. (*Less than Significant with Mitigation*)

The geographic scope of analysis for cumulative hazards and hazardous materials impacts encompasses the project area and nearby areas that: (1) could affect soil and groundwater conditions within the project area; or (2) are in or near areas classified by CAL FIRE as High or

Very High Fire Hazards Severity Zones. The former types of impacts are generally site-specific and depend on past, present, and future land uses and existing soil, sediment, and groundwater conditions. The latter tend to be in suburban or rural areas, within or adjacent to large tracts of densely vegetated upland open spaces. The timeframe during which the MPWSP could contribute to cumulative hazards and hazardous materials effects includes the construction and operations phases.

Cumulative Impacts during Project Construction

Significant cumulative impacts related to hazards could occur if the incremental impacts of the MPWSP combined with the incremental impacts of one or more projects identified in **Table 4.1-2** to: (1) substantially increase risk that people or the environment would be exposed to hazardous materials (as described in Impacts 4.7-1 through 4.7-4); or (2) substantially increase risk of wildfire (as described in Impact 4.7-5).

The following cumulative projects described in Table 4.1-2 in Section 4.1 would potentially be geographically adjacent to or overlap with components of the proposed project, and could result in ground disturbance and construction activities that would overlap in time with project construction:

- Laguna Seca Villas (No. 3)
- Marina Downtown Vitalization Specific Plan (No. 10)
- Marina Station (No. 12)
- Main Gate Specific Plan (No. 18)
- TAMC's Monterey Peninsula Light Rail Project (No. 38)
- CEMEX Removal Plan and Restoration Plan (No. 63)

Because potential impacts related to the release of hazardous materials and risk of wildfire are highly site-specific, this analysis first addresses the potential for impacts of the proposed project and the above projects to combine at these specific locations, and then describes the potential cumulative impacts that could occur if the impacts do combine.

The Laguna Seca Villas Project would be located approximately 350 feet from the eastern end of the Ryan Ranch-Bishop Interconnection Improvements pipeline. Although the construction schedule for the Laguna Seca Villas Project is currently unknown, the likelihood that both projects would be under construction at the same time is remote because construction of the Ryan Ranch-Bishop Interconnection pipeline would proceed at about 250 feet per day, and so would only be in the immediate vicinity of the Laguna Seca project location for several days at most, while construction of the Laguna Seca project is unknown and could occur after the proposed project construction has been completed in this location. As described in Section 4.7.1.1 and shown in Figure 4.7-2, there is one site (former Fort Ord York School) within 0.25 mile of this location that was investigated for the presence of MECs, but none were identified and the property was cleared for transfer; therefore, no existing environmental contamination, including contaminated groundwater, is expected to be present at this location.

The reasonably foreseeable physical environmental changes associated with the proposed Marina Downtown Vitalization Specific Plan include construction on the east side of Del Monte Boulevard at Reservation Road, where the new Desalinated Water Pipeline would connect to the new Transmission Main. Although the construction schedule for this component of the specific plan is currently unknown, the likelihood that both projects would be under construction at the same time is remote because the specific plan has not been adopted and no projects have been approved at this intersection, and because construction of the new Desalinated Water Pipeline and new Transmission Main would proceed at about 250 feet per day, and so would only be in the immediate vicinity of the Del Monte Boulevard/Reservation Road intersection for several days. As described in Section 4.7.1.1 and shown in Figure 4.7-2, the former Don's One Hour Dry Cleaners site is undergoing remediation for dry cleaning solvents released to groundwater beneath the site, located at the Del Monte Boulevard/Reservation Road intersection. While the specific plan project on the north side of Reservation Road at Del Monte Boulevard would be located on the remediation site, as noted in Table 4.7-1, the groundwater remediation at this location does not underlie proposed project components. Therefore, the proposed project would not contribute to a potential cumulative impact associated with disturbing or dewatering contaminated groundwater at this location.

The Marina Station project would be located along Del Monte Boulevard in the vicinity of the new Desalinated Water Pipeline. For the same reasons described for the Marina Downtown Vitalization Specific Plan above, the potential for construction of the new Desalinated Water Pipeline to occur at the same time as the proposed Marina Station project is remote. No existing environmental contamination, including contaminated groundwater, is expected to be present within 0.25 mile of the Marina Station project.

The adopted Main Gate Specific Plan is located near the junction of Highway 1 and Lightfighter Drive in the vicinity of the new Transmission Main. For the same reasons described for the Marina Downtown Vitalization Specific Plan above, the potential for construction of the new Transmission Main to occur at the same time as the proposed Main Gate Specific Plan projects is remote. No existing environmental contamination, including contaminated groundwater, is expected to be present within 0.25 mile of the location of the Main Gate Specific Plan projects.

TAMC's Monterey Peninsula Light Rail Project would be located adjacent to approximately 9 miles of proposed project pipelines, including portions of the Castroville Pipeline, new Desalinated Water Pipeline, and new Transmission Main. Because the light rail project is on hold indefinitely until TAMC can secure funding, its construction schedule is unknown. Because that project must undergo environmental review and permitting prior to construction. The U.S. Army Fort Ord Sites 2 and 12 and University Villages are located on the other side of Highway 1 from the TAMC right-of-way, and as shown in Table 4.7-1, remediation for those sites does not underlie proposed project components and therefore also does not underlie the TAMC right-of-way.

Activities associated with implementation of the CEMEX Removal Plan and Reclamation Plan would be located adjacent to the subsurface slant wells, and removal and reclamation activities would be completed between 2020 and 2025; therefore, this project would occur in the same geographic location and timeframe as slant well construction. Removal of some structures could cause accidental release of hazardous materials that are stored onsite. The Removal Plan is required to provide a contingency plan that addresses potential spills of fuel or other hazardous releases that may result from the use of mechanized equipment and responses to a potential spill, and the discharge of hazardous materials into any receiving waters is prohibited (CCC, 2017).

All of the above projects would be subject to the same regulatory requirements as the proposed project, including the implementation of health and safety plans and soil and groundwater management plans (implemented as **Mitigation Measures 4.7-2a** and **4.7-2b** for the proposed project), and therefore any cumulative projects involving releases of hazardous materials also would be required to remediate their respective sites to established regulatory standards. This would be the case regardless of the number, frequency, or size of the release(s), or the residual amount of chemicals present in the soil from previous spills. Therefore, while it is possible that the proposed project and other projects in the cumulative could result in releases of hazardous materials at the same location, the responsible party associated with each spill would be required to remediate site conditions to the same established regulatory standards. The proposed project would result in a significant impact resulting from the potential release of or exposure to hazardous materials in soil or groundwater that could have a significant contribution to a potentially significant cumulative impact resulting from such releases from more than one project. However, the proposed project's impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.7-2a** and **4.7-2b**, which would require that construction contractors prepare a health and safety plan in accordance with Cal OSHA regulations and comply with all relevant environmental regulations and plan appropriately for the safe and lawful handling and disposal of excavated soil and groundwater, when encountered. The residual less-than-significant effects of the proposed project that would remain after mitigation would not combine with the potential residual effects of cumulative projects to cause a potential significant cumulative impact because residual impacts would be highly site-specific and, as described above, are highly unlikely to occur within the same timeframe such that multiple releases could occur before containment and/or mitigation can be implemented. Accordingly, with implementation of mitigation measures, the project would have a less than significant contribution to a cumulative impact with respect to the release of hazardous materials during construction.

As also described in Section 4.7.5.1, proposed project components located in or near areas classified by CAL FIRE as High or Very High Fire Hazard Severity Zones include Main System Hidden Hills Interconnection Improvements, Ryan Ranch-Bishop Interconnection Improvements, and Carmel Valley Pump Station (CAL FIRE, 2007; 2008). As described in Impact 4.7-5, compliance with CAL FIRE's regulations governing the use of construction equipment in fire-prone areas (see Section 4.7.2, Regulatory Framework) and compliance with the state fire code would reduce the project-specific incremental impact to a less-than-significant level.

Two of the cumulative projects identified in **Table 4.1-2** – Rancho Cañada Village and Golf Club (Nos. 27 and 28) – are proposed for the Very High Fire Hazard Severity Zone within which the Carmel Valley Pump Station is proposed. Although the Rancho Cañada projects' construction schedules are unknown, there is some possibility that they could overlap with the timing of the

Carmel Valley Pump Station construction, and would involve the use of construction equipment or other vehicles with internal combustion engines and/or gasoline powered tools that are capable of producing a spark, flame, or fire. Concurrent activities could result in a cumulative increase in wildland fire risk in this location. This compounded increase in risk could place an additional burden on local fire departments, particularly if access for emergency vehicles were impeded. CAL FIRE’s fire prevention regulations related to the use of construction equipment in fire-prone areas also would apply to all cumulative projects involving construction. The Rancho Cañada Village and Golf Club projects would be required to comply with these fire prevention regulations, including the use of spark arrestors and fire suppression equipment. Compliance with these regulations would reduce the potential for a significant cumulative impact with respect to substantial increase in wildfire risk, and would ensure that the project’s incremental contribution is less than significant.

Cumulative Impacts during Project Operations

Significant cumulative impacts related to operational hazards could occur if the incremental impacts of the proposed project combined with those of one or more of the projects identified in **Table 4.1-2** to cause a substantial increase in risk that people or the environment would be exposed to hazardous materials used or encountered during the operations phase (Impact 4.7-6).

As discussed in Section 4.7.5.2, Subsurface Slant Wells, maintenance of the proposed subsurface slant wells would require use of cleaning materials and vehicles, introducing potential for inadvertent releases of hazardous materials into the soil and groundwater. MPWSP Desalination Plant operation would require the use of hazardous materials, such as fuels and water treatment chemicals, to be stored onsite. The ASR injection/extraction wells would require disinfection chemicals stored at the Phase I ASR facilities site to be used at a higher rate, but would not cause an increase in onsite storage volume. Compliance with the various regulations regarding the safe transport, use, and storage of hazardous materials (see Section 4.7.2, Regulatory Framework) would reduce the project-specific incremental impact to a less-than-significant level.

Many of the cumulative projects identified in **Table 4.1-2** also would require the transport, use, and storage of hazardous chemicals. However, none of the cumulative projects would be expected to store or handle large quantities of hazardous materials on or adjacent to sites of proposed project components that would also require storage or handling of such materials. As a result, no significant cumulative impact would occur in association with the storage or handling of hazardous materials. However, significant cumulative impacts involving hazardous materials releases could occur along transportation corridors used by the MPWSP and cumulative projects.

For all project components involving the handling, storage, and disposal of hazardous materials, CalAm and/or its contractors would be required to implement a Hazardous Materials Business Plan and comply with applicable regulations, including those governing containment, site layout, and emergency response and notification procedures in the event of a spill or release. Transportation and disposal of wastes, such as spent cleaning solutions, would also be subject to regulations for the safe handling, transportation, and disposal of chemicals and wastes (see Section 4.7.2, Regulatory Framework). As noted previously, such regulations include standards to which parties responsible for hazardous materials releases must return spill sites, regardless of location, frequency, or size of release, or existing background contaminant concentrations. Therefore, compliance with existing laws and regulations regarding hazardous materials transport would reduce the risk of environmental or human exposure to such materials. The combined effects of the proposed project and cumulative projects would result in a less than significant cumulative impact.

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4.8 Land Use, Land Use Planning, and Recreation

Sections	Figures	Tables
4.8.1 Setting/Affected Environment 4.8.2 Regulatory Framework 4.8.3 Approach to Analysis 4.8.4 Evaluation Criteria 4.8.5 Direct and Indirect Effects of the Proposed Project 4.8.6 Cumulative Effects of the Proposed Project	4.8-1 Coastal Zone 4.8-2 Recreational Opportunities in the Northern Project Area 4.8-3 Recreational Opportunities in the Southern Project Area	4.8-1 Overview of Designated Land Uses and Recreational Facilities within 0.25 mile of the Proposed Facilities 4.8-2 Applicable Regional and Local Land Use Plans and Policies Relevant to Land Use and Recreation 4.8-3 Summary of Impacts – Land Use and Recreation

This section analyzes the potential for the Monterey Peninsula Water Supply Project (MPWSP or proposed project) to affect established land uses and recreational facilities, and evaluates project consistency with applicable plans, policies, and ordinances governing land use in the project area. Potential impacts on agricultural land uses are evaluated separately in Section 4.16, Agriculture.

Comments received on the April 2015 Draft EIR related to Land Use, Land Use Planning, and Recreation concern offshore/nearshore and beach recreational uses and access to the Monterey Bay National Marine Sanctuary, the MPWSP's relationship to and compatibility with Fort Ord Dunes State Park, as well as MPWSP consistency with applicable regulatory requirements. This section has been modified to address these comments. Revisions pertaining to land uses and recreational opportunities are presented in Section 4.8.1, Setting /Affected Environment. Revisions concerning compatibility with applicable regulatory requirements and potential effects of the proposed project are presented in Sections 4.8.2, Regulatory Framework and, 4.8.5, Direct and Indirect Effects of the Proposed Project, respectively.

4.8.1 Setting/Affected Environment

The study area for evaluation of land use and recreation impacts includes the lands on which MPWSP facilities are proposed, the adjacent lands, and recreational facilities and resources located within 0.25 mile of the proposed facility sites.

The project area extends approximately 10 miles, from the northern reach of the Castroville Pipeline on Merritt Street in Castroville, to the southern terminus of the new Transmission Main in Seaside, with proposed components extending further south for approximately 6 miles into the Carmel Valley and east to the unincorporated community of Hidden Hills along Highway 68. The project area includes portions of the cities of Marina, Seaside, Monterey, and unincorporated Monterey County, and federal lands (e.g., Presidio of Monterey, the Ord Military Community[1]). With the exception of the federal lands, land uses in the project area are generally governed by the local coastal programs, general plans, and zoning codes of the local jurisdictions. Land uses on federal lands are governed by the respective managing federal agency (e.g., U.S. Army).

[1] These are lands retained by the U.S. government, following the Fort Ord Base Closure and Reuse Plan.

Lands within the former Fort Ord military reservation have mostly been transferred to state and local governments and are now subject to state and local land use plans and regulations. However, local agency land use decisions affecting transferred lands within the former Fort Ord remain subject to discretionary review by the Fort Ord Reuse Authority (FORA).

Land uses in the northern portion of the project area are dominated by agricultural and industrial uses; the remaining portions of the project area are generally urbanized and include residential, commercial, institutional, quasi-public, and industrial land uses. The westernmost portions of the project area lie within the coastal zone, as defined in the California Coastal Act and regulated by the California Coastal Commission (CCC).

There are a variety of recreational resources throughout Monterey County—from federal preserves to state beaches and small neighborhood parks. These resources include the Monterey Bay National Marine Sanctuary (MBNMS), along with designated parks, trails, and open spaces that provide for a diversity of active and passive recreational opportunities. Public access to the area's unique natural resources is an important component of recreation in Monterey County. The Monterey Bay shoreline hosts one of the most significant and rare dune landforms on the west coast. Public access to beaches, dunes, and hiking trails is available from numerous locations along the coast. There are also several designated bikeways throughout the project area that serve as both recreational facilities and alternative transportation routes.[2]

A more detailed overview of existing land uses, land use jurisdictions, and recreational resources adjacent to or within the vicinity (0.25 mile) of MPWSP components is provided in **Table 4.8-1** and described below. Many of the proposed project components would be buried entirely underground, and predominantly within existing public rights-of-way and at existing public water/wastewater facility sites. These include the Source Water Pipeline and optional alignment, new Desalinated Water Pipeline and optional alignment, Castroville Pipeline and optional alignments, Brine Discharge Pipeline, Pipeline to CSIP Pond, ASR Conveyance Pipelines, new Transmission Main and optional alignment, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

Figure 4.8-1 presents the various local government jurisdictional boundaries and the extent of the coastal zone relative to the project area. **Figures 4.8-2** and **4.8-3** present parks and other recreational facilities in the project area.

[2] "Bikeway" is a general term used to refer to facilities that provide primarily bicycle travel. The Caltrans Bikeway Planning and Design section (Chapter 1000 of the State of California Highway Design Manual) categorizes bikeways into three types:

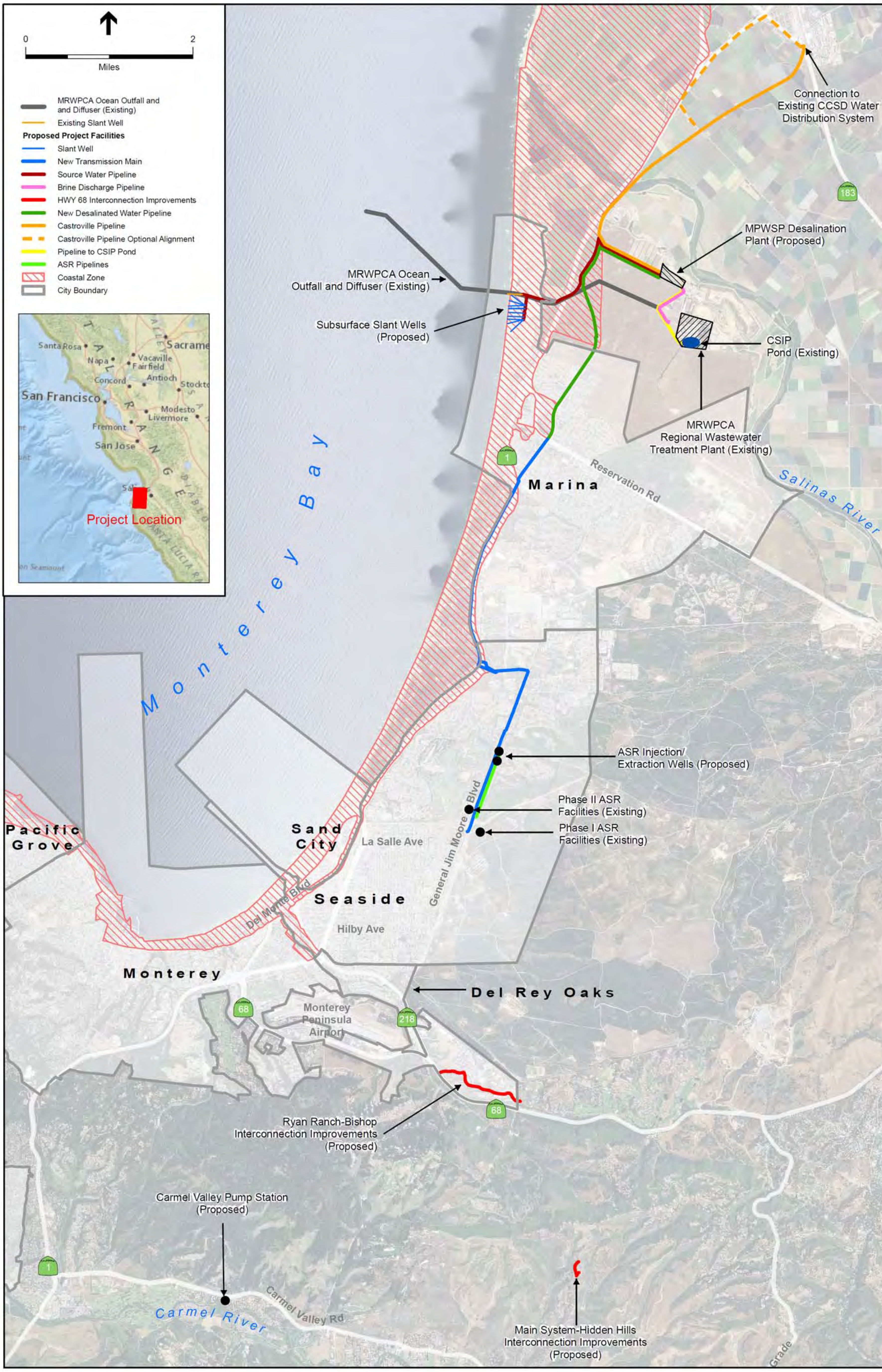
- Class I bikeways are bike paths and provide a completely separated right-of-way for the exclusive use of bicycle and pedestrian traffic with cross-flow minimized. Class I bikeways exist along General Jim Moore Boulevard between Normandy Road and Coe Avenue. The Monterey Peninsula Recreational Trail (also known as the Monterey Bay Coastal Trail), which extends approximately 18 miles between Castroville and Pacific Grove, is also a Class I bikeway.
- Class II bikeways are bike lanes and are indicated by a striped lane for one-way bike travel on a street or highway, typically with signage placed along the street segment. A Class II bikeway exists along General Jim Moore Boulevard between Coe Avenue and Canyon del Rey Boulevard.
- Class III bikeways are bike routes that involve shared use of the roadway with motor vehicle traffic. Typically these facilities are city streets with signage indicating the designated bike route without additional striping or improvements for bicyclists.

TABLE 4.8-1
OVERVIEW OF DESIGNATED LAND USES AND RECREATIONAL FACILITIES WITHIN 0.25 MILE OF THE PROPOSED FACILITIES

Proposed Facility	Location	Jurisdiction	Adjacent Land Uses	Public Recreational Areas Within 0.25 mile
Subsurface Slant Wells	On a 376-acre coastal parcel in north Marina, within a former CEMEX mining area.	City of Marina (coastal zone)	Agricultural / Industrial / Recreation (to the west)	Publicly accessible beach and MBNMS, west of CEMEX property
MPWSP Desalination Plant	On the upper 25-acre terrace of a 46-acre vacant parcel on Charles Benson Road, northwest of the Monterey Regional Water Pollution Control Agency (MRWPCA) Regional Wastewater Treatment Plant.	Monterey County	Agricultural, Light Industrial, Public / Quasi-Public	None within 0.25 mile
Source Water Pipeline & Optional Alignment	Between the proposed subsurface slant wells in a former CEMEX mining area and the CEMEX building located approximately 0.5 mile inland.	City of Marina (coastal zone)	Agricultural / Industrial	Publicly accessible beach and MBNMS
	Between the CEMEX building and the intersection of Del Monte Boulevard and Charles Benson Road.	Monterey County (coastal zone)	Agricultural, Railroad	Monterey Peninsula Recreational Trail
	From the intersection of Del Monte Boulevard and Charles Benson Road to the proposed MPWSP Desalination Plant site.	Monterey County (inland)	Agricultural, Light Industrial, Public / Quasi-Public	Monterey Peninsula Recreational Trail
New Desalinated Water Pipeline & Optional Alignment	From the proposed MPWSP Desalination Plant site, west along Charles Benson Road, and south along Lapis Road and Del Monte Boulevard to the boundary between the city of Marina and unincorporated Monterey County.	Monterey County (inland and coastal zone)	Agricultural, Light Industrial, Public / Quasi-Public, Railroad	Monterey Peninsula Recreational Trail
New Desalinated Water Pipeline & Optional Alignment	From the boundary between the city of Marina and unincorporated Monterey County, south along Del Monte Boulevard to Reservation Road.	City of Marina (inland and coastal zone)	Residential, Commercial, Parklands Light Industrial	Monterey Peninsula Recreational Trail, Locke-Paddon Park, and Vince DiMaggio Park
Castroville Pipeline	From the proposed MPWSP Desalination Plant site, north to Merritt Street via Monte Road.	Monterey County (inland)	Agricultural, Light Industrial, Public / Quasi-Public, Railroad	Monterey Peninsula Recreational Trail
Castroville Pipeline Optional Alignment	From the proposed MPWSP Desalination Plant site, north to Merritt Street via Monte Road, Nashua Road, and Highway 156.	Monterey County (inland)	Agricultural, Light Industrial, Commercial, Residential, and Public / Quasi-Public, Railroad	Monterey Peninsula Recreational Trail and Cato Phillips Park
Brine Discharge Pipeline	Between the MPWSP Desalination Plant site and the headworks to the MRWPCA ocean outfall at the MRWPCA Regional Wastewater Treatment Plant.	Monterey County (Inland)	Agricultural, Light Industrial, Public / Quasi-Public	None within 0.25 mile
Brine Mixing Box	Between the Brine Discharge Pipeline and the headworks to the MRWPCA ocean outfall at MRWPCA Regional Wastewater Treatment Plant.	Monterey County (Inland)	Light Industrial, Public / Quasi-Public	None within 0.25 mile

TABLE 4.8-1 (Continued)
OVERVIEW OF DESIGNATED LAND USES AND RECREATIONAL FACILITIES WITHIN 0.25 MILE OF THE PROPOSED FACILITIES

Proposed Facility	Location	Jurisdiction	Adjacent Land Uses	Public Recreational Areas Within 0.25 mile
Pipeline to CSIP Pond	Between the proposed MPWSP Desalination Plant site and the existing CSIP pond located at the southern end of the MRWPCA Regional Wastewater Treatment Plant.	Monterey County (inland)	Agricultural, Light Industrial, Public / Quasi-Public	None within 0.25 mile
ASR-5 and ASR-6 Wells and ASR Conveyance Pipelines	Along General Jim Moore Boulevard between Ardennes Circle and Coe Avenue in the Fitch Park military housing area.	City of Seaside (the ASR-5 and ASR-6 Well sites are owned by U.S. Army; local land use regulations have limited application; inland) Presidio of Monterey – Ord Military Community (U.S. Army)	Residential, Open Space, Recreational, Public/Quasi-Public	Class I and II bikeway (General Jim Moore Boulevard); Bayonet and Blackhorse Golf Course
New Transmission Main & Optional Alignment	From Reservation Road south along the west side of Del Monte Boulevard to the Highway 1 undercrossing/onramp.	City of Marina (inland)	Residential, Commercial, Light Industrial, Public / Quasi-Public, Parklands, Railroad, Highway	Monterey Peninsula Recreational Trail, Locke-Paddon Park, Marina State Beach, Fort Ord Dunes State Park, Bayonet and Blackhorse Golf Course
New Transmission Main & Optional Alignment	From the Del Monte/Highway 1 undercrossing south to the Lightfigher Drive/Highway 1 undercrossing.	City of Marina (coastal zone)	Parklands, Railroad, Highway, Public/Quasi-Public	Monterey Peninsula Recreational Trail, Fort Ord Dunes State Park, Marina State Beach
New Transmission Main & Optional Alignment	From the Lightfigher Drive/Highway 1 undercrossing west and south to terminus at Coe Avenue/General Jim Moore Boulevard intersection.	City of Seaside (inland and coastal zone)	Parklands, Railroad, Highway, Public/Quasi-Public, Commercial, Recreational	Fort Ord Dunes State Park, Monterey Peninsula Recreational Trail, Stilwell Park, Class I and II bikeway (General Jim Moore Boulevard), Bayonet and Blackhorse Golf Course
Carmel Valley Pump Station	In Monterey County, near the Carmel Valley Road/Rancho San Carlos Road intersection	Monterey County (inland)	Open Space, Residential	Class II bikeway (Carmel Valley Road)
Ryan Ranch–Bishop Interconnection Improvements	Along Ragsdale Drive, Lower Ragsdale Drive, and Wilson Road.	City of Monterey (inland)	Residential, Commercial, Open Space/Parkland	Ryan Ranch Park, Class II bikeways (Ragsdale Drive, Lower Ragsdale Drive, and Wilson Road)
Main System–Hidden Hills Interconnection Improvements	Tierra Grande Drive	Monterey County (inland)	Residential, Open Space	None within 0.25 mile



SOURCE: ESA, 2016, CCC, 2014

205335.01 Monterey Peninsula Water Supply Project

Figure 4.8-1
Coastal Zone

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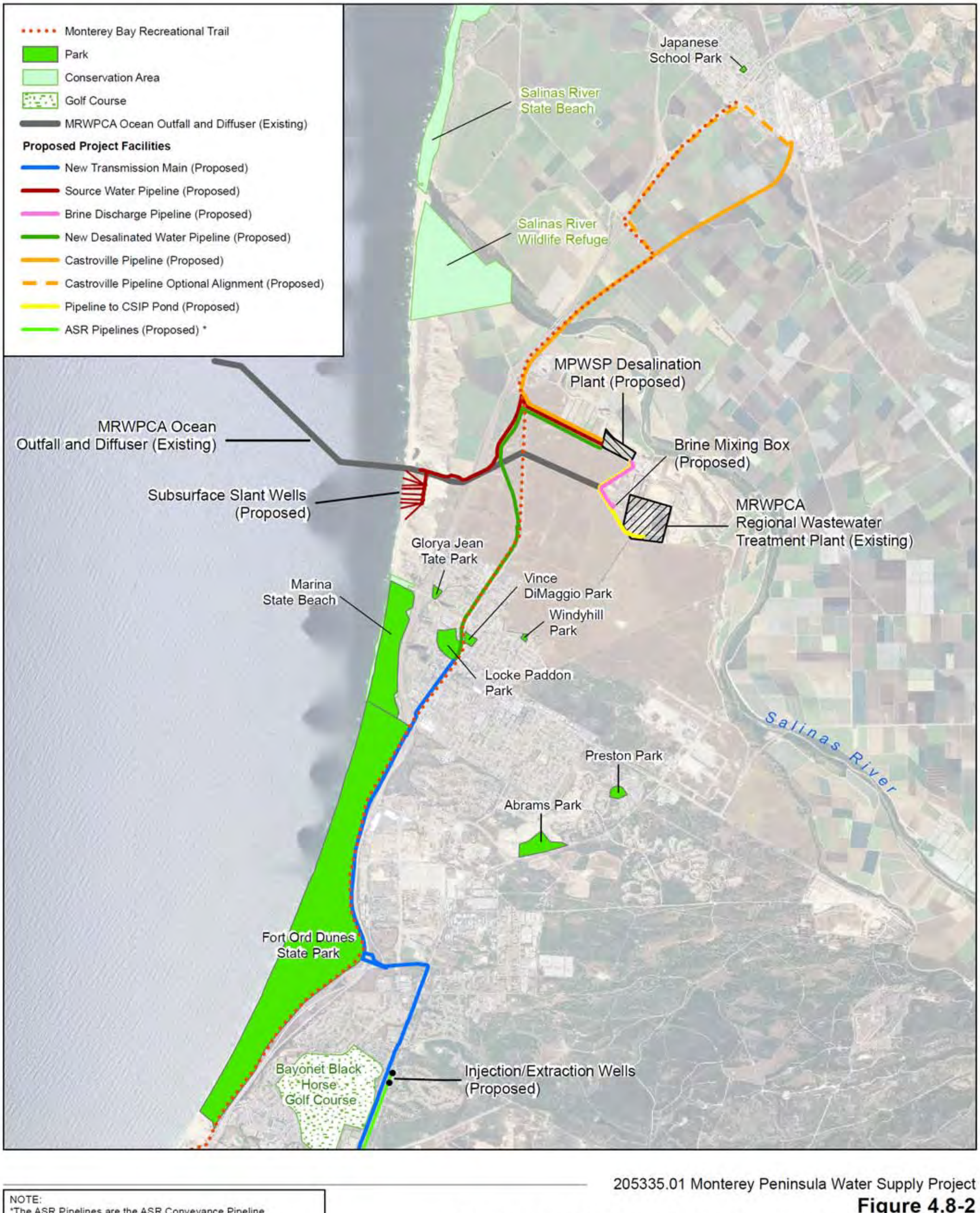
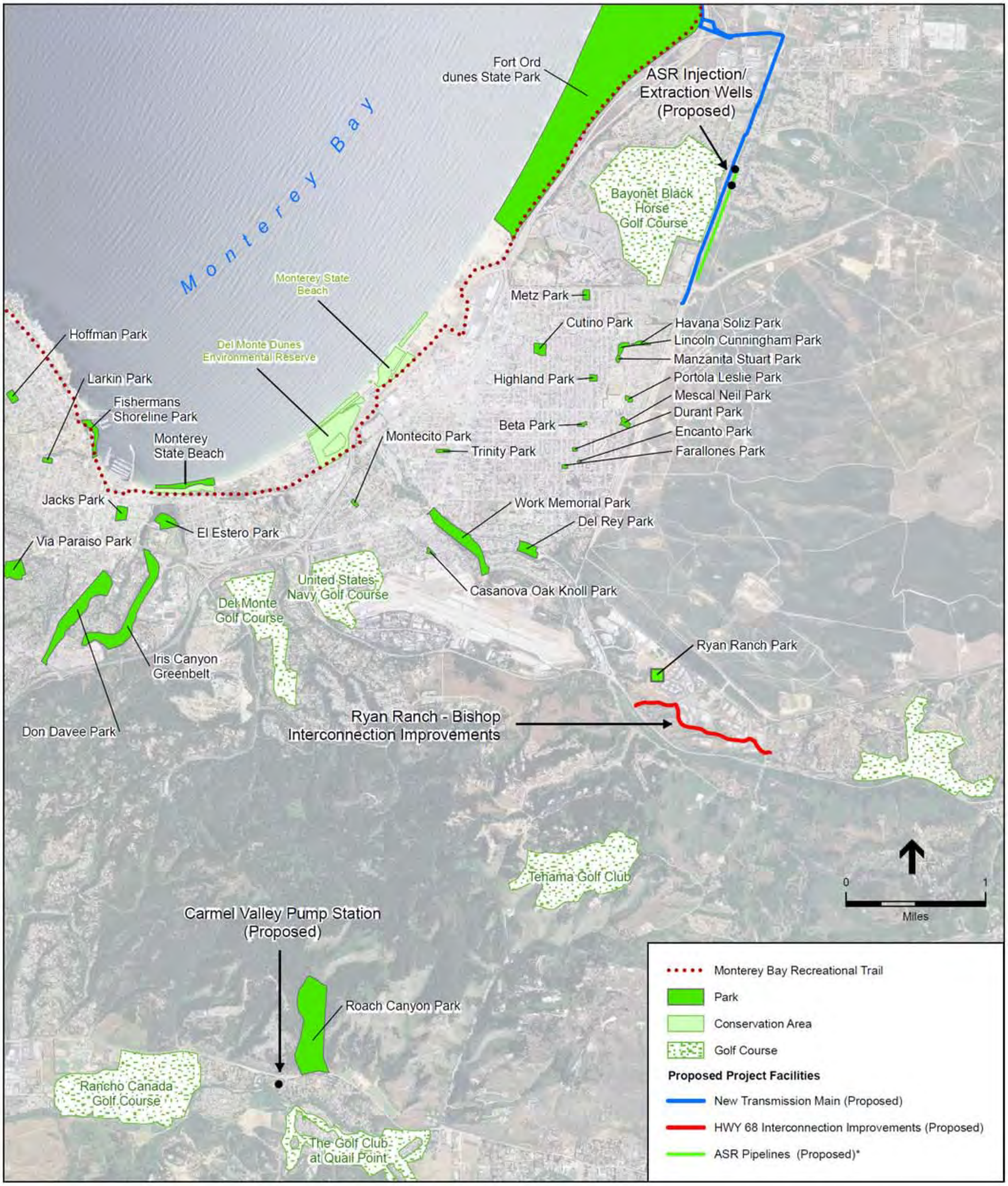


NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

205335.01 Monterey Peninsula Water Supply Project

Figure 4.8-2
Recreational Opportunities in the Northern Project Area

SOURCE: GlobeXplorer, 2006; ESRI, 2007; ESA, 2016



NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

SOURCE: GlobeXplorer, 2006; ESRI, 2007; ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.8-3

Recreational Opportunities in the Southern Project Area

4.8.1.1 Subsurface Slant Wells

Land Use. A portion of the subsurface slant wells would be constructed above the maximum high-tide elevation, within the 376-acre CEMEX sand mining facility located on the coast in north Marina (Figure 3-3). CEMEX owns the coastal land above mean high tide; the California State Lands Commission owns the land below mean high tide. The sand mining operations at the CEMEX facility have been in existence since 1906. The sand mining facility is bounded to the west by beach and the Pacific Ocean, to the north and south by vegetated sand dunes, and to the east by open space, grazing and croplands, and Highway 1.

Recreation. The beach bordering the western edge of the CEMEX property is publicly accessible from paths to the beach which are located off public roads approximately 1 mile south at Marina Dunes Preserve and 1.25 miles north at the Salinas River National Wildlife Refuge. The Monterey Peninsula Recreational Trail is located approximately 1 mile east of the slant well site. The CEMEX property abuts the mean high water line representing the boundary of MBNMS, which extends out to approximately 30 miles offshore, and provides for a diversity of recreational opportunities, including swimming, kayaking, fishing, surfing, scuba diving, wildlife viewing, among many others. There are no other recreational resources on the site of the subsurface slant wells.

4.8.1.2 MPWSP Desalination Plant

Land Use. The MPWSP Desalination Plant would be constructed on an upper 25-acre portion of a 46-acre vacant parcel located on Charles Benson Road, in unincorporated Monterey County (see Figure 3-5). The site of the proposed MPWSP Desalination Plant is bounded to the west and north by open space, grazing, and agricultural lands, and to the east and south by public facility and industrial uses at the Monterey County Landfill and the Monterey Regional Water Pollution Control Agency (MRWPCA) Regional Wastewater Treatment Plant.

Recreation. There are no parks or recreational facilities in the vicinity of the MPWSP Desalination Plant site.

4.8.1.3 Source Water Pipeline

Land Use. The Source Water Pipeline would traverse portions of northern Marina and unincorporated Monterey County (see Figures 3-3, 3-4, and 3-5). Lands adjacent to the proposed and optional alignments are used primarily for open space, grazing, and row crop farming, agricultural operations, and public/quasi-public uses (e.g. Monterey County Landfill and The Last Chance Mercantile Reuse Store).

Recreation. The Source Water Pipeline and optional alignment would cross the Monterey Peninsula Recreational Trail at the intersection of Del Monte Boulevard and Charles Benson Road. There are no parks or other recreational facilities in the vicinity of the proposed Source Water Pipeline alignment.

4.8.1.4 New Desalinated Water Pipeline

Land Use. The approximately 0.8-mile segment of the new Desalinated Water Pipeline between Del Monte Boulevard and the proposed MPWSP Desalination Plant site would be co-located with the Source Water Pipeline and the Castroville Pipeline and follow one of the two routes (proposed or optional alignments). The northern portion of the proposed alignment would cross both coastal and inland portions of unincorporated Monterey County; in the vicinity of Lapis Road and Del Monte Boulevard, the pipeline would be constructed within the Transportation Agency for Monterey County (TAMC) right-of-way (see Figures 3-4, 3-5 and 3-6).

Land uses in the vicinity of the Monterey County portion of the proposed new Desalinated Water Pipeline and optional alignment include primarily open space, grazing, and row crop farming, and public/quasi-public uses. The southern portion of the proposed alignment crosses portions of inland and coastal Marina (see Figures 3-6 and 3-7). Land uses in the vicinity of the Marina segment of the proposed new Desalinated Pipeline and optional alignment include residential, light industrial, commercial, parks, and public facilities.

Recreation. The new Desalinated Water Pipeline and optional alignment would cross the Monterey Peninsula Recreational Trail at the intersection of Del Monte Boulevard and Charles Benson Road. In addition, the segment between the Lapis Road/Del Monte Boulevard (southern) intersection and Del Monte Boulevard Reservation Road intersection would be constructed parallel to and west of the Monterey Peninsula Recreational Trail. Locke-Paddon (within Marina’s coastal zone) and Vince DiMaggio Parks are located adjacent to the west and east, respectively, of the new Desalinated Water Pipeline proposed and optional alignment near its junction with the transmission main at Reservation Road.

4.8.1.5 Castroville Pipeline

Land Use. The Castroville Pipeline would be constructed within unincorporated Monterey County. The segment of the proposed alignment extending from Del Monte Boulevard to the CCSD Well #3 on Merritt Street would follow the TAMC right-of-way along Monte Road. The Castroville Pipeline Optional Alignment 1 would follow other public rights-of-way (see Figures 3-11 and 3-12). Land uses in the vicinities of both alignment options are predominantly agricultural, with adjacent lands primarily used for row crop production and grazing. Public and quasi-public and light industrial (e.g., Monterey County Landfill and former Dole Fresh Vegetables packaging plant) also occur along the proposed and optional alignments. Residential and commercial land uses are more prevalent along the segment of the Castroville Pipeline Optional Alignment 1 that extends along Merritt Street in Castroville.

Recreation. The Castroville Pipeline and Castroville Pipeline Optional Alignment 1 would cross the Monterey Peninsula Recreational Trail at the intersection of Del Monte Boulevard and Charles Benson Road. In addition, the segment of the Castroville Pipeline Optional Alignment 1 along Highway 156 between the Nashua Road and Merritt Street would be constructed parallel to and west of the Monterey Peninsula Recreational Trail. Optional alignment 1 would also pass within 0.25 mile of Cato Phillips Park.

4.8.1.6 Brine Discharge Pipeline and Brine Mixing Box

Land Use. The Brine Discharge Pipeline would extend from the MPWSP Desalination Plant to the Brine Mixing Box, which would connect to the MPWPCA outfall at the existing MRWPCA Regional Wastewater Treatment Plant (see Figure 3-5). The proposed Brine Discharge Pipeline alignment and Brine Mixing Box are within unincorporated Monterey County. Lands in the vicinity of these two components are used for open space, grazing, and the industrial operations of the Monterey County Landfill and MRWPCA Regional Wastewater Treatment Plant.

Recreation. There are no parks or recreational facilities in the vicinity of the proposed Brine Discharge Pipeline alignment or the Brine Mixing Box.

4.8.1.7 Pipeline to CSIP Pond

Land Use. The Pipeline to CSIP Pond would extend from the MPWSP Desalination Plant to a point of connection with the Castroville Seawater Intrusion Project, located within the MRWPCA Regional Wastewater Treatment Plant (see Figure 3-5). The proposed alignment is within unincorporated Monterey County. As with the Brine Discharge Pipeline, lands adjacent to the Pipeline to CSIP Pond alignment are used for open space, grazing, and the Monterey County Landfill and MRWPCA Regional Wastewater Treatment Plant.

Recreation. There are no parks or recreational facilities in the vicinity of the proposed Pipeline to CSIP Pond alignment.

4.8.1.8 Aquifer Storage and Recovery Facilities

Land Use. The proposed ASR injection/extraction wells (ASR-5 and ASR-6 Wells) would be located east of General Jim Moore Boulevard and south of Ardennes Circle, in the Fitch Park military housing area (Figure 3-9). These MPWSP components would be constructed in the former Fort Ord military base (Ord Military Community) on land owned by the U.S. Army. The sites of the proposed facilities are presently undeveloped. The ASR-5 and ASR-6 Wells would be constructed within 50 feet of existing residences. The ASR Recirculation Pipeline, ASR Conveyance Pipeline, and ACR Pump-to-Waste Pipeline (ASR pipelines) would be installed within the General Jim Moore Boulevard right-of-way, within city of Seaside jurisdiction. The alignment would connect the proposed ASR-5 and ASR-6 Wells with existing infrastructure near the General Jim Moore/Coe Avenue intersection. Land uses in the vicinity of these facilities are predominantly residential, recreational (e.g., Bayonet and Black Horse Golf Courses), and public/quasi-public (e.g., Seaside Middle School) in nature.

Recreation. Class I and II bikeways exists along General Jim Moore Boulevard, between Coe Avenue and Normandy Road. The ASR injection/extraction well sites and pipeline alignments occur within 0.25 miles of the Bayonet and Blackhorse Golf Courses.

4.8.1.9 New Transmission Main

Land Use. The new Transmission Main and optional alignment would extend approximately 6 miles from the new Desalinated Water Pipeline connection at the intersection of Del Monte Boulevard and Reservation Road in Marina to a connection with existing infrastructure near the General Jim Moore/Coe Avenue intersection (Figures 3-7, 3-8, and 3-9). Portions of the proposed and optional pipeline alignments would be located within the Marina and Seaside land use jurisdictions. Land use patterns along the alignment east of Highway 1 are within Marina, and are defined primarily by medium-density commercial and residential development. Public and quasi-public land uses also occur in this area (e.g., Marina Del Mar Elementary School). West of Highway 1, the pipeline would be constructed within the TAMC right-of-way. Land uses in this area include parklands and railroad to the west and highway to the east. Land use patterns along the alignment east of Highway 1 within Seaside are predominantly residential, recreational (e.g., Bayonet and Black Horse Golf Courses), public/quasi-public (e.g., CSUMB and Dual Language Academy of the Monterey Peninsula, and Ord Military Community).

Recreation. The segment of the new Transmission Main and optional alignment between the Del Monte Boulevard/Reservation Road intersection and Highway 1/Lightfigher Drive undercrossing would be constructed parallel to and west of the Monterey Peninsula Recreational Trail. The pipeline would also pass within 0.25 mile of Bayonet and Black Horse Golf Courses, Locke-Paddon Park, Marina State Beach, Fort Ord Dunes State Park, Stilwell Park, Monterey Peninsula Recreational Trail, and Class I and II bikeways (General Jim Moore Boulevard).

4.8.1.10 Carmel Valley Pump Station

Land Use. The Carmel Valley Pump Station would be located approximately 250 feet south of Carmel Valley Road and 500 feet west of Rancho San Carlos Road, in unincorporated Monterey County (Figure 3-10c). Land uses in the vicinity of the pump station site include low density residential development and open space.

Recreational. A Class II bikeway exists along Carmel Valley Road.

4.8.1.11 Interconnection Improvements for Highway 68 Satellite Systems

Land Use. The Ryan Ranch–Bishop Interconnection Improvements would be located within the city of Monterey adjacent to lands used for office park, light industrial, and parks and open space (Figure 3-10a). The proposed Main System–Hidden Hills Interconnection Improvements would be located in unincorporated Monterey County adjacent to low-density residential development, surrounded by open space (Figure 3-10b).

Recreation. The proposed Ryan Ranch–Bishop Interconnection Improvements would be located adjacent to Ryan Ranch Park (accessible via Ryan Ranch Road), an open space area with a network of unpaved hiking trails that is managed by the City of Monterey Parks Department. Class II bikeways also exist along Ragsdale Drive, Lower Ragsdale Drive, and Wilson Road. The Laguna

Seca Recreation Area is within 3 miles of the proposed Main System–Hidden Hills Interconnection Improvements.

4.8.2 Regulatory Framework

This section provides an overview of applicable federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as "regulatory requirements") relevant to land use and recreational resources. A brief summary of each is provided, along with a finding regarding the project's conformity with those regulatory requirements. The conformity findings concern the project as proposed, without mitigation. Where the project, as proposed, would be consistent with the applicable regulatory requirement, no further discussion of project consistency with that regulatory requirement is provided. Where the project, as proposed, would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to a specific impact topic within EIR/EIS Section 4.8.5, Direct and Indirect Effects of the Project, where the potential inconsistency is addressed in more detail. Where applicable, the discussion in Section 4.8.5 includes the identification of feasible mitigation that would resolve or minimize the potential inconsistency.

4.8.2.1 Federal Regulations

Marine Protection, Research, and Sanctuaries Act of 1972

The Marine Protection, Research, and Sanctuaries Act of 1972, also known as the National Marine Sanctuaries Act (Act), provides for the identification, designation, and management of marine areas that are of special significance due to their recreational, ecological, historical, research, educational, or aesthetic qualities. Accordingly, a primary purpose of the Act's implementing regulations (15 CFR 922) is to protect, preserve, and manage recreational resources of national marine sanctuaries. The importance of recreation is further emphasized in the 2008 MBNMS *Final Management Plan*, which includes a desalination action plan and strategies to guide siting and development of desalination projects in a manner that is protective of MBNMS resources, including recreational opportunities. In addition, MBNMS worked with the National Marine Fisheries Service (NMFS) to develop desalination guidelines (NOAA, 2010). See EIR/EIS Section 6.4, Project Consistency with Monterey Bay National Marine Sanctuary Desalination Guidelines, for additional discussion.

Activities that would be subject to MBNMS jurisdiction, which extends seaward from the mean high water line out to approximately 30 miles, are generally limited to drilling the subsurface seawater intake pipelines into the submerged lands of MBNMS, and the discharge of brine from an existing ocean outfall, which is approximately two miles off shore and 90-110 feet below sea level. No MPWSP facilities are proposed for or would involve construction that would impede access to, or use of the MBNMS as a recreational resource. As proposed, implementation and operation of the MPWSP could have water quality and marine biological resources impacts that could affect recreational opportunities. Additional discussion of MPWSP effects related to water quality and marine biological resources is provided in EIR/EIS Section 4.3, Surface Water Hydrology and Water Quality, and Section 4.5, Marine Biological Resources.

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972 provides for management of the nation's coastal resources, including the Great Lakes, and balances economic development with environmental conservation. The California Coastal Commission has jurisdiction for CZMA implementation throughout the state.[3] The California Coastal Act contains numerous enforceable policies that are directed at protecting and, where feasible, restoring coastal resources. The California Coastal Commission applies the Coastal Act's policies when reviewing applications for coastal development permits in California state waters. The Coastal Commission also applies land use policies when reviewing federally licensed and permitted activities to ensure they are consistent with the State's coastal management program in accordance with the CZMA federal consistency provision. The Coastal Commission considers an application for a coastal development permit to cover the requirement for an applicant submitting a consistency certification to the Coastal Commission. Typically, the Coastal Commission will provide its response (concurrence, conditional concurrence, or objection) in its staff report for the coastal development permit.

Real Property Master Plan – Presidio of Monterey

The U.S. Army's 1983 Real Property Master Plan – Presidio of Monterey provides for the orderly development and maintenance of land, facilities, and infrastructure within the Presidio of Monterey Installation, which includes the Presidio of Monterey and the Ord Military Community. The Master Plan depicts Army Land Use Categories assigned to lands within these military planning areas. Use categories identified within these military planning areas include: Community, Professional/Institutional, Troop, and Residential. The Master Plan also describes the types of uses appropriate within each category. The document does not prohibit development of utilities in any of the land use categories. In February 2013, the U.S. Army Corps of Engineers completed an environmental impact statement (EIS) analyzing the potential environmental consequences of implementing a revised Real Property Master Plan. The EIS evaluated three alternatives for the Real Property Master Plan. The alternatives focus almost entirely on facilities improvements and new construction and would not involve revisions to existing land use designations. The U.S. Army is in the process of revising the Real Property Master Plan, based upon the findings of the EIS. The completion date for the revised Real Property Master Plan remains unknown. Elements of the project subject to the Real Property Master Plan include the ASR-5 and ASR-6 Wells. In 2010 and 2012, the U.S. Army prepared NEPA environmental assessments (EAs) analyzing the potential land use effects of the ASR-5 and ASR-6 wells proposed for the Presidio of Monterey. The EAs concluded that the proposed MPWSP facilities would have no impact with respect to conflict with any applicable land use plans, policies, or regulations (RBF Consulting, 2010; 2012).

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[3] Except within the San Francisco Bay-Delta where the Bay Conservation and Development Commission has authority for implementation of CZMA within its jurisdictional area.

4.8.2.2 State Regulations

Fort Ord Reuse Authority and Fort Ord Reuse Plan

The 1994 Fort Ord Reuse Authority Act (California Government Code section 67650-67700); hereafter referred to as the "FORA Act") was passed with the goals of facilitating the transfer, reuse, and management of lands within the former Fort Ord military reservation. Pursuant to the Act, on May 20, 1994, the Fort Ord Reuse Authority (FORA) was established as a corporation of the State of California. The purpose of the FORA is to prepare, adopt, finance, and implement a plan for the land formerly occupied by Fort Ord. The FORA is governed by a 13-member board (FORA Board) comprised of representatives from the Monterey County Board of Supervisors, and city council members from each of the cities of Marina, Seaside, Carmel, Del Rey Oaks, Sand City, Monterey, Pacific Grove, and Salinas (member agencies). The FORA Act directs the Board to prepare and adopt a plan (Reuse Plan) for the future use and development of lands within the former Fort Ord Territory (FORA, 1997a).

The FORA Act requires that, with a few exceptions for universities, all Fort Ord land that has been transferred from the federal government must be used in a manner consistent with the Reuse Plan. This provision is affirmed and explained further in the Fort Ord Master Resolution, adopted in March of 1997 (FORA, 1997b). For member agencies with jurisdiction over lands within the former Fort Ord territory, the Master Resolution (Section 8.01.010(c)) requires all general plans, and "all policies and programs relating to the land use or the construction, installation, or maintenance of capital improvements or public works within the Fort Ord Territory, shall be consistent with the Reuse Plan…" Before any such plans or regulations may take effect, the member agency must first obtain from the FORA Board a determination that the plan or regulation is consistent with the Reuse Plan. Upon certification by the Board, development review authority is transferred to the member agency with jurisdiction over the FORA lands. However, pursuant to the FORA Act and Master Resolution (Section 8.01.030(c)), after certification of said general plan, policies, and programs, the Board may continue to review for consistency member agencies' development entitlement decisions in the former Fort Ord territory (FORA, 1997b).

The Fort Ord Reuse Plan, adopted in 1997, includes the information normally found in a general plan. It establishes the general plan context and rationale, addressing matters of community visioning, existing setting, use concepts, and implementation; and includes the Reuse Plan Elements, setting forth goals, objectives, policies, and programs by land use and jurisdiction for land use, circulation, recreation and open space, conservation, noise, and safety (FORA, 1997a).

MPWSP components proposed within former Fort Ord territory and subject to the Reuse Plan include the New Transmission Main and ASR pipelines (which would be located within Seaside's jurisdiction and subject to Seaside approvals), and a segment of the Ryan Ranch-Bishop Interconnection Improvements (which would occur within Monterey County's jurisdiction and subject to Monterey County's approvals). However, as noted above, the FORA Board may, at its discretion, decide to review local decisions with respect to Fort Ord Reuse Plan consistency.

Preliminary determinations by the EIR preparers regarding MPWSP consistency with the Reuse Plan policies related to land use and recreation are presented in **Table 4.8-2**. Analyses of consistency with Reuse Plan policies related to other topics presented in their respective topical sections of this EIR/EIS.

Fort Ord Dunes State Park General Plan

The Fort Ord Dunes State Park General Plan (General Plan) outlines the purpose and vision for the park; and sets forth management goals and guidelines for protection of the natural environment; resource restoration; and for the siting, design, and construction of future park improvements in a manner that avoids environmental effects. Prominent among the General Plan's guiding principles (and indeed the mission of California Department of Parks and Recreation) is the provision and management of recreational opportunities consistent with resource management and protection. The new Transmission Main and optional alignment would traverse an approximately 0.25-mile-long band of Fort Ord Dunes State Park lands between Divarty Street/1st Street and the alignments' Highway 1 undercrossing near Lightfighter Drive. The pipeline segment proposed for State Parks lands would be sited between the Monterey Peninsula Recreational Trail and the existing railroad. This area is presently inaccessible to the public, as the alignment area is fenced. Pipeline installation would temporarily disturb this area during construction, but would then be returned to its approximate pre-construction condition. As a result, new Transmission Main pipeline construction activities within Fort Ord Dunes State Park would not conflict with General Plan goals or guidelines related to recreation. Additional discussion of effects on Fort Ord Dunes State Park access is provided in Impacts 4.8-1 and 4.8-2.

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) was enacted by the State Legislature in 1976 to provide long-term protection of the State's 1,100-mile coastline for the benefit of current and future generations. The Coastal Act provides for the long-term management of lands within California's coastal zone boundary, as established by the Legislature and defined in Coastal Act (Section 30103). The width of the coastal zone varies across the State, extending inland a couple hundred feet in some locations to 5 miles in others, and offshore out to 3 miles. A map of the coastal zone in the project vicinity is shown in **Figure 4.8-1**.

The Coastal Act created a unique partnership between the State (acting through the CCC) and local government entities (15 coastal counties and 61 coastal cities) to manage the conservation and development of coastal resources through a comprehensive planning and regulatory program. This is accomplished primarily through the preparation of sets of policies and regulations adopted by coastal local governments to carry out Coastal Act policies at the local level, known as local coastal programs. Upon CCC certification of a local coastal program, authority for issuance of Coastal Development Permits is transferred from the State (via the CCC) to the certified local government. Decisions for major public works projects under certified local coastal programs are appealable to the CCC. Until a local coastal program is certified, responsibility for issuance of Coastal Development Permits remains with the CCC. The agency also retains jurisdiction over certain coastal areas, such as tidelands and public trust lands. Local Coastal Programs applicable to the MPWSP are discussed below.

The Coastal Act includes specific policies for management of natural resources and public access within the coastal zone (see Division 20 of the Public Resources Code). Of primary relevance to land use and recreation are Coastal Act policies concerning coastal public access and recreational opportunities, locating new development near existing development, and ensuring new or expanded public works facilities are designed and limited so as not to induce growth inconsistent with the Coastal Act. A preliminary assessment of project consistency with these priorities is provided here. Final determinations regarding project consistency are reserved for the Coastal Commission.

With respect to public access and recreation, MPWSP construction may have short-term effects on shoreline access (i.e., increased traffic and temporary park entrance detours) during the construction period. However, most MPWSP components in proximity to the coastal zone (i.e., pipelines) would be buried underground and would not substantially affect long-term public access to or along the coast. Coastal erosion and shoreline retreat may result in encroachment of the subsurface slant wells (Site 1) onto the beach, which could affect access along the shoreline. This issue is addressed further in Section 4.2, Geology, Soils, and Seismicity. Specifically, please refer to Table 4.2-6 for additional discussion of the project's conformity with applicable Coastal Act policies related to beach erosion.

Regarding locating new development, the new Transmission Main would be constructed below ground and within an existing developed right-of-way. The subsurface slant wells would be sited among existing industrial mining development. These MPWSP facilities would impose no long-term demands on area public services.

Concerning growth inducement, which is discussed more fully in Chapter 2, Water Demand, Supplies, and Water Rights, the MPWSP has been sized to meet the requirements of State Water Resources Control Board (SWRCB) Orders 95-10 and 2009-0060, and the 2006 groundwater basin adjudication, along with existing and anticipated future demands of existing water entitlement holders, the anticipated economic recovery of the local hospitality industry, and development of existing legal lots of record.

For these reasons, the MPWSP would not conflict with Coastal Act policies related to land use and recreation.

4.8.2.3 Local Regulations

County and City General Plans, Ordinances, and Regulations

California state law requires each county and city to adopt "a comprehensive, long-term general plan for the physical development of the county or city, and any land outside its boundaries which bears relation to its planning" (Government Code Section 65300). State planning and zoning law (Government Code Section 65800 et seq.) also provides for local government adoption and administration of zoning laws, ordinances, rules and regulations to implement such general plans. A summary of general plans and ordinances applicable to the project area is provided below.

Local Coastal Programs

The local coastal program typically includes a land use plan and implementing regulations (also referred to as an "implementation plan"). The land use plan that is part of the local coastal program sets forth the types, locations, and intensities of land uses, along with applicable resource protection and development policies for lands within the coastal zone. The implementation plan typically consists of zoning regulations, zoning map, and permit procedures. In general, a local coastal program is not considered certified until the CCC approves both the land use plan and implementation plan. Within the project area, several jurisdictions have certified local coastal programs, including: Monterey County and the cities of Marina, and Seaside (described below in Section 4.8.2.3). The CCC retains jurisdiction for issuance of Coastal Development Permits areas of the coastal zone where no LCP has been certified. Local coastal program policies related to land use and recreation and adopted for the purpose of avoiding or mitigating an environmental effect are presented in **Table 4.8-2** and discussed further in Section 4.8.5, Direct and Indirect Effects of the Project. Local coastal program policies related to other types of coastal resources are addressed in their respective topical sections of this EIR/EIS.

Monterey County Plans and Policies

The following sections describe documents prepared by Monterey County that govern land use decisions in the project area. Monterey County policies related to land use and recreation and adopted for the purpose of avoiding or mitigating an environmental effect are presented in **Table 4.8-2**. A discussion of the project's consistency with established land use plan and zoning designations within the project area is provided below.

2010 Monterey County General Plan

The *2010 Monterey County General Plan* includes area or master plans for 14 regional planning areas, including the four coastal land use plans (see "Local Coastal Programs," below) and ten inland area or master plans. The MPWSP would involve development within several of these 14 planning areas, including the Greater Monterey Peninsula, North County, North County LUP, Salinas, and Carmel Valley planning areas. The *2010 Monterey County General Plan* consists of policies that apply countywide and policies unique to specific regions. The Land Use Element contains countywide policies that are applicable to the entire unincorporated area. Area plans contain more focused policies that address specific regional or local issues (Monterey County, 2010).

Monterey County Local Coastal Program

The County's coastal zone is divided into four areas governed by land use plans and coastal implementation plans, which together comprise the County's Local Coastal Program. The four land use plans include those for Big Sur Coast, Carmel, Del Monte Forest (coastal portion), and North County (which also includes the Moss Landing Community Plan). The four land use plans stand alongside the *1982 Monterey County General Plan*[4] and function as the general plan for the respective areas of the coastal zone. The MPWSP, as well as components of the Alternatives (discussed in Chapter 5, Alternatives), would involve development within the *North County Land Use Plan* area; the Big Sur Coast, Carmel Valley, and Del Monte Forest area land use plans are not applicable to lands within the project area.

Monterey County Zoning Ordinance

The Zoning Ordinance is the primary implementation tool for the land use policies identified in the *2010 Monterey County General Plan* and *North County Land Use Plan*. Land uses within the project area would be subject to the requirements of the Inland Zoning Ordinance (Title 21) and the Coastal Zoning Ordinance (Title 20). The Zoning Ordinance, which is applicable to unincorporated areas, implements the goals and policies of the General Plan and North County Land Use Plan by identifying specific types of land uses, intensity of uses and development standards to be used in guiding the development and use of land within unincorporated areas of the county.

Monterey County Municipal Health and Safety Code (Title 10) Section 10.72 (Not Applicable to MPWSP)

Although not applicable to the MPWSP (described below), this discussion is provided for informational purposes. In 1989, Monterey County adopted an ordinance governing the issuance, suspension and revocation of permits for the construction and operation of desalination facilities. Sections 10.72.010 et seq. establishes:

> *No person, firm, water utility, association, corporation, organization, or partnership, or any city, county, district, or any department or agency of the State shall commence construction of or operate any Desalination Treatment Facility (which is defined as a facility which removes or reduces salts from water to a level that meets drinking water standards and/or irrigation purposes) without first securing a permit to construct and a permit to operate said facility. Such permits shall be obtained from the Director of Environmental Health of the County of Monterey, or his designee, prior to securing any building permit.*

Applicants for desalination construction permits must give notice of an intent to construct; provide preliminary feasibility studies; show conformance with local land use zoning; and submit "specific detail engineering, construction plans and specifications;" submit a chemical analysis of the intake water, a study of groundwater extraction impacts, studies and plans for brine and other by-products disposal, and an alternative water supply contingency plan (Section 10.27.020A-F). The ordinance further requires public ownership of desalination plants and requires that each plant have a dual system, where one side is held in reserve in the event of a breakdown on the other side. Section 10.72.030(B) requires applicants to: "Provide assurances that each facility would be owned and operated by a public entity."

[4] A comprehensive update to the 1982 Monterey County General Plan was adopted in 2010. However, as described therein: "This General Plan does not amend and is not intended to amend the existing Monterey County Local Coastal Program (LCP). The County will review the LCP after adoption of the General Plan Update. If any of the goals, policies, and standards of the General Plan are to be incorporated into the LCP, such proposals would be subject to all appropriate public review procedures, including noticed public hearings, separate action by the County Board of Supervisors, and submission of major LCP amendments to the Coastal Commission for certification." Therefore, for purposes of implementation of the LCP, the relevant 1982 General Plan policies currently remain applicable.

On September 21, 2012, CPUC Administrative Law Judge Gary Weatherford issued a proposed "Decision Declaring Preemption of County Ordinance and the Exercise of Paramount Jurisdiction," stating in the first paragraph:

> This decision determines that the authority of the Commission in regard to this application preempts Monterey County Code of Ordinance, Title 10, Chapter 10.72, concerning construction, operation, and ownership of desalination plants. This decision further determines that the findings, conclusions, and orders herein are an exercise of jurisdiction that is paramount to that of a county Superior Court concerning the same subject (CPUC, 2012a).

On October 31, 2012, the CPUC issued a decision affirming the ALJ's ruling (CPUC, 2012b). On December 4, 2012, CalAm, the County of Monterey, and Monterey County Water Resources Agency entered into a settlement agreement to resolve pending lawsuits, among other matters. The settlement agreement acknowledges the CPUC Decision as final and binding, and also acknowledges that the Ordinance in question shall not apply to CalAm or the MPWSP (CalAm, 2012).

City Plans and Policies

The following sections describe documents prepared by the cities that govern land use decisions in the project area. A list of local government policies applicable to the project and relevant to land use and recreation is provided in **Table 4.8-2**. A discussion of the project's consistency with established land use plan and zoning designations within the project area is provided below.

City of Marina General Plan

The *City of Marina General Plan* was adopted on October 31, 2000 and last amended in November 2006. The two major purposes of the *City of Marina General Plan* are to guide long-term planning and development decisions by the City in a manner consistent with City goals, and to provide clear documentation of the City's goals and commitments. The *City of Marina General Plan* is only applicable to the portions of the project that are inside the coastal zone (slant wells and a portion of the source water pipeline); components outside the coastal zone would not require a Use Permit (Szymanis, 2014). *City of Marina General Plan* policies related to land use and recreation and applicable to the project are presented in **Table 4.8-2**.

City of Marina Local Coastal Land Use Plan

The *City of Marina Local Coastal Land Use Plan*, certified by the CCC in 1982, establishes appropriate land uses by type and density, and establishes a policy framework for plan implementation. The policy framework of the land use plan includes the policy statements, the plan guidelines, the land use map, narrative descriptions of the land use map, and the recreational access component. Marina Local Coastal Land Use Plan Policies related to land use and recreation and applicable to the project are presented in **Table 4.8-2**.

City of Marina Zoning Ordinance

The purpose of the Zoning Ordinance of the City of Marina (Title 17 of the Marina Municipal Code) is to "promote and protect the public health, safety, peace, morale, comfort, convenience and general welfare, and for the accomplishment thereof…" (Chapter 17.02.030). The document sets forth a plan of development for the city and establishes districts and standards to guide, control, and regulate the city's future growth and development. The Zoning Ordinance also implements the city's Local Coastal Program.

City of Seaside General Plan

The City of Seaside General Plan, adopted in 2004, provides goals, policies, and a framework for decision-making and coordinated planning. The Land Use Element describes the balance of land uses, examines patterns of development, and considers water supply. City of Seaside General Plan policies related to land use and recreation and applicable to the project are presented in **Table 4.8-2**.

City of Seaside Local Coastal Program Land Use Plan

Seaside's Local Coastal Program Land Use Plan was comprehensively updated in 2012. The Land Use Plan provides specific goals, policies, and implementation actions that govern land and water use within Seaside's coastal zone. The Land Use Plan is organized into subareas, including a general coastal zone chapter, supported by the Laguna Grande, Roberts Lake, Beach, and Del Monte subarea chapters that focus on specific issues in each subarea. Seaside Local Coastal Program Land Use Plan Policies related to land use and recreation and applicable to the project are presented in **Table 4.8-2**.

City of Seaside Zoning Ordinance

The City of Seaside adopted its existing Zoning Ordinance (Title 17 of the Seaside Municipal Code) in 2006, and adopted substantial revisions in February of 2014. The purpose of the Seaside Zoning Ordinance is "to protect and to promote the public health, safety, comfort, convenience, prosperity, and general welfare of residents, and businesses in the City (Chapter 17.10.10)." This is accomplished through the provision of standards and guidelines for the continuing orderly growth and development of Seaside. The Zoning Ordinance is used by the City to carry out the goals, objectives, and policies of the General Plan and Local Coastal Program. The City's Coastal Zoning Ordinance (Title 18, Section 18.10) serves as the City's Local Coastal Program - Coastal Implementation Plan, and sets forth additional regulations for properties within Seaside's coastal zone.

City of Monterey General Plan (Not Applicable to MPWSP)[5]

The *City of Monterey General Plan* is a statement of the community's vision for the future. Adopted in 2005 and amended through 2010, the General Plan is a long-range, comprehensive plan that coordinates all major components of the community's physical development for 1020 years. The Land Use and Open Space Elements contain goals, policies, and programs for land use designations, infrastructure and public services, and open space conservation. The *City of Monterey General Plan* is not applicable to the project as no project components proposed for the City of Monterey would require a Use Permit (Caraker, 2014).

5 There are no project components proposed within the city of Monterey coastal zone. Therefore, the Monterey Local Coastal Land Use Plans, which are presently undergoing revision, are not discussed in this section.

City of Monterey Zoning Ordinance

The purpose of the City of Monterey Zoning Ordinance (Chapter 38 of the City Charter) is to protect and promote the public health, safety, and general welfare of Monterey, and to implement the policies of the General Plan. This is done through the establishment of land use, development, and administrative regulations to control the use and development of property. The Zoning Ordinance applies to pipelines proposed within the city boundaries.

MPWSP Consistency with Applicable Land Use and Recreation Plans and Policies

In keeping with CEQA's interest in addressing a project's potential conflicts with applicable regulatory requirements related to land use, **Table 4.8-2** describes the regional and local land use plans, policies, and regulations pertaining to land use and recreation that are relevant to the MPWSP. Also included in **Table 4.8-2** is an analysis of the project's potential conflicts with such plans, policies, and regulations. Where the analysis concludes the MPWSP would not conflict with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes that the MPWSP may conflict with the applicable plan, policy, or regulation, the reader is referred to Section 4.8.5, Direct and Indirect Effects of the Project, for additional discussion. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

Land Use Plan and Zoning Designations

This subsection describes the land use plan and zoning designations on lands for which MPWSP components are proposed and provides a preliminary assessment of the project's potential to conflict with those designations. In most instances, the local land use regulations provide for conditional authorization of public utilities facilities with a Use Permit and/or Coastal Development Permit (CDP). In order for the local jurisdiction to issue such a permit, the body charged with permit administration must first make findings that the project meets the criteria for permit issuance (e.g., protective of public health, safety, and welfare). Land use policies and regulations flow from these concepts. Accordingly, determinations of a project's consistency with such criteria often include consideration for a project's compatibility with established land use policies and regulations. Thus, a project's consistency with local land use policies and regulations can serve as an indicator of its likelihood of meeting the criteria necessary for issuance of a Use Permit.

Determinations of consistency with these criteria are reserved for the governing body with jurisdiction. However, for purposes of environmental review and public disclosure, this EIR/EIS provides a preliminary assessment of project consistency with applicable local land use policies and regulations. Analyses of consistency in this EIR/EIS are presented in each Chapter 4 environmental topic's Regulatory Framework subsection (e.g., Section 4.8.2 of this Land Use, Land Use Planning, and Recreation section) and appear in tables entitled "Regional and Local Land Use Policies Relevant to [subject impact topic]". As noted in the preceding subsection, where potential conflicts are identified, the reader is referred to the respective environmental topic's subsection entitled Direct and Indirect Effects of the Project where the potential conflict is further evaluated.

TABLE 4.8-2
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO LAND USE AND RECREATION

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface Slant Wells, new Transmission Main, Source Water Pipeline, and new Desalinated Water Pipeline	***Policy 1:*** To insure access to and along the beach, consistent with the recreational needs and environmental sensitivity of Marina Coastal area.	This policy is intended to protect the public's right of access to and along the shoreline – a public recreational resource.	Consistent: Project construction may have short-term effects on public shoreline access (i.e., increased traffic) during the construction period, but none would preclude or otherwise have direct effects on public shoreline access. With coastal erosion, there is potential for the beach to retreat back to the subsurface slant wells (Site 1), which could affect access along the shoreline. This issue is addressed further in Section 4.2, Geology, Soils, and Seismicity. Specifically, please refer to Table 4.2-6 for additional discussion of the project's conformity with applicable Coastal Act policies related to beach erosion.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface Slant Wells, Transmission Main, Source Water Pipeline, and new Desalinated Water Pipeline	***Policy 8:*** To prohibit further degradation of the beach environment and conserve its unique qualities.	This policy is intended to protect the beach environment and associated uses from impacts of development.	Consistent: By locating the slant well system several hundred feet inland of the beach, within the CEMEX property's former mining area, impacts on the beach environment would be avoided. With coastal erosion, there is potential for the beach to retreat back to the subsurface slant wells (Site 1, which could degrade the beach environment. This issue is addressed further in Section 4.2, Geology, Soils, and Seismicity. Specifically, please refer to **Table 4.2-6** for additional discussion of the project's conformity with applicable Marina Local Coastal Land Use Plan policies related to beach erosion.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface Slant Wells, new Transmission Main, Source Water Pipeline, and new Desalinated Water Pipeline	***Policy 32:*** To minimize adverse environmental affects, by concentrating new development within or adjacent to areas of existing development in the coastal zone.	This policy is intended to protect coastal resources from the impacts of sprawling new development.	Consistent: The proposed subsurface slant well site is in the vicinity of existing sand mining operations; pipelines would be located primarily in existing utility corridors and roadway rights-of-way.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface Slant Wells, new Transmission Main, Source Water Pipeline, and new Desalinated Water Pipeline	***Policy 41:*** To give priority to coastal-dependent development on or near the shoreline and ensure that environmental effects are mitigated to the greatest extent possible.	This policy is intended to protect Marina's existing coastal land uses and resources from incompatible land uses, and to preserve future opportunities for use of shoreline areas for developments that are compatible with those uses and resources.	Consistent: The seawater intake system is the only MPWSP component proposed for a parcel adjacent to Marina's shoreline. The proposed development is coastal dependent as it requires proximity to the shore to function. The seawater intake system would not conflict with existing adjacent land uses. With coastal erosion, there is potential for the beach to retreat back to the subsurface slant wells (Site 1), which could affect access along the shoreline. This issue is addressed further in Section 4.2, Geology, Soils, and Seismicity. Specifically, please refer to **Table 4.2-6** for additional discussion of the project's conformity with applicable Marina Local Coastal Land Use Plan policies related to beach erosion.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface Slant Wells, new Transmission Main, Source Water Pipeline, and new Desalinated Water Pipeline	***Policy 4.112***: The policies of the Community Land Use Element are designed to protect areas with significant agricultural or natural-habitat value from being displaced by development, and they are designed to protect and conserve air, water and energy resources.	This policy is intended to protect important agricultural, biological, air, water, and energy resources from impacts of development.	Potentially Inconsistent: The project's implications for agricultural, biological, air, and energy resources are discussed in EIR/EIS Sections 4.16, 4.6, 4.10, and 4.18, respectively. The project's implications for surface water and groundwater resources are discussed in EIR/EIS Sections 4.3 and 4.4. Specifically, refer to **Tables 4.16-2, 4.6-2, 4.10-3, 4.18-2, 4.3-5,** and **4.4-6** for additional discussion of the project's conformity with applicable Marina General Plan policies related to agricultural, biological, air, and energy resources, respectively. In all but one instance related to compatibility with established land use policies regarding biological resources (i.e., Impact 4.6-4), potential land use policy and regulation conflicts are resolvable with the implementation of recommended mitigation. Because this policy pertains to topics other than land use and recreation and is addressed elsewhere in the EIR/EIS, it is not discussed further in Section 4.8.

TABLE 4.8-2 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO LAND USE AND RECREATION

Project Planning Region	Applicable Plan	Plan Element/ Section	Subject Project Components	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Policies and Programs
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Infrastructure	Subsurface Slant Wells, new Transmission Main, Source Water Pipeline, and new Desalinated Water Pipeline	***Primary Policy 3.3.14:*** Support water resource programs, including desalinization and reclamation efforts, to provide an adequate water supply to accommodate General Plan permitted growth.	This policy is intended to ensure water availability within the planning area to accommodate future growth.	Consistent: The project would facilitate the production and transmission of desalinated water, which would be available for use within the Marina General Plan area.
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Public Access and Recreation	New Transmission Main	***Policy PAR-DM 1.1.B** – Management of Public Access and Recreational Opportunities – Southern Pacific Railroad:* The City shall maintain (keep free of debris, trash, etc.) the portions of the Southern Pacific Railroad right-of way transportation corridor that are within the Del Monte Subarea (III.B.3.b.3).	This policy is intended to protect public access to and use of recreational facilities.	Consistent: Project construction may have short-term, temporary, and direct effects on the TAMC right-of-way and/or Monterey Peninsula Recreational Trail access (i.e., closures during pipeline installation). However, the pipelines would be buried underground and would not substantially impede long-term public access and recreation to or along the right-of-way and/or trail.
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Coastal Zone	New Transmission Main	***Policy NCR-CZ 1.1.C** – Coastal Resources:* New development shall be located in areas where it will not have a significant adverse effect either individually or cumulatively on natural coastal resources and public access and recreation.	This policy is intended to protect coastal resources, public access, and recreation from significant adverse effects associated with new development.	Consistent: The new Transmission Main and new Monterey Pipeline would be located within existing developed or disturbed utility corridors and road/railroad rights-of-way. Public access through work areas would be temporarily disrupted during construction. However, the pipelines would be buried underground and would not substantially impede long-term public access and recreation.
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Coastal Zone	New Transmission Main	***Policy PAR-CZ 1.1.B** –* Protection of Public Access and Recreational Opportunities: Maximize and protect public access including pedestrian and bicycle connectivity and recreational opportunities in the coastal zone consistent with resource conservation principles, public safety, public rights, and the rights of private property owners.	This policy is intended to protect the public's right of access to shoreline access points – a public recreational resource.	Consistent: The new Transmission Main and new Monterey Pipeline would be located within existing developed or disturbed utility corridors and road/railroad rights-of-way. Public access through work areas would be temporarily disrupted during construction. However, the pipelines would be buried underground and would not substantially impede long-term public access and recreation.
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Coastal Zone	New Transmission Main	***Policy LUD-CZ 2.1.B** – Compliance with Land Use Plan Policies:* New development shall be required to demonstrate compliance with the Land Use Plan policies applicable to the particular project under consideration.	This policy is intended to ensure new development is compatible with adjacent land uses and that coastal resources and public access are protected.	Consistent: The new Transmission Main and new Monterey Pipeline would be buried below ground and would not present any land use conflicts. Furthermore, CalAm would be required to demonstrate land use plan policy consistency through the Coastal Development Permit application process, prior to project implementation.
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Coastal Zone	New Transmission Main	***Policy LUD-CZ 2.1.D** - Coastal Development Permit Required:* A Coastal Development Permit shall be required for all development within the coastal zone.	This policy is intended to ensure that all development proceeds in a manner that is consistent with the coastal resource planning and management policies of the Seaside Local Coastal Program and the Coastal Act.	Consistent: As noted in Chapter 3, Project Description, CalAm would apply for all necessary local permits, including a Coastal Development Permit
City of Seaside (coastal zone & inland area)	Seaside General Plan	Land Use	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline	***Policy LU-5.1:*** Review development proposals to ensure that adequate water supply, treatment, and distribution capacity is available to meet the needs of the proposed development without negatively impacting the existing community.	This policy is intended to ensure that adequate water supply, treatment, and distribution capacity is available.	Consistent: The purpose of the project is to improve the reliability and sustain adequacy of water supply, treatment, and distribution capacity. Discussed more fully in Chapter 2, Water Demand, Supplies, and Water Rights, the MPWSP is sized to meet the requirements of SWRCB Orders 95-10 and 2009-0060, and the 2006 groundwater basin adjudication, along with existing and anticipated future demands of existing water entitlement holders, the anticipated economic recovery of the local hospitality industry, and development of existing legal lots of record.
City of Seaside (coastal zone & inland area)	Seaside General Plan	Land Use	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline	***Policy LU-5.2:*** Work cooperatively with local and regional water suppliers to ensure adequate water reserves.	This policy is intended to ensure adequate water reserves.	Consistent: The purpose of the project is to improve the reliability and sustain adequacy of water supply, treatment, and distribution capacity locally and regionally. Additional discussion of CalAm and MPWSP coordination with other water providers in the region is provided in Chapter 3.
City of Seaside (coastal zone & inland area)	Seaside General Plan	Land Use	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline	***Policy LU-5.4:*** Promote the use of recycled water for irrigation of parks, golf courses, and public landscaped areas in the community.	This policy is intended to promote the use of recycled water for irrigation.	Consistent: The MPWSP would not preclude opportunities to promote and expand use of recycled water for irrigation in Seaside.

TABLE 4.8-2 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO LAND USE AND RECREATION

Project Planning Region	Applicable Plan	Plan Element/ Section	Subject Project Components	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Policies and Programs
City of Seaside (coastal zone & inland area)	Seaside General Plan	Conservation/Open Space Element	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline	***Policy COS-2.1:*** Work with regional and local water providers to ensure that adequate supplies of water are available to meet existing development and future growth.	This policy is intended to ensure that adequate supplies of water are available.	Consistent: The purpose of the project is to improve the reliability and sustain adequacy of water supply, treatment, and distribution capacity locally and regionally. Additional discussion of CalAm and MPWSP coordination with other water providers in the region is provided in Chapter 3.
City of Seaside (coastal zone & inland area)	Seaside General Plan	Conservation/Open Space Element	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline	***Policy COS-2.2:*** Encourage the production, distribution, and use of recycled water.	This policy is intended to encourage the use of recycled water.	Consistent: The MPWSP would not preclude opportunities to produce, distribute, and use recycled water in Seaside.
City of Seaside (coastal zone & inland area)	Seaside General Plan	Conservation/Open Space Element	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline	***Policy COS-2.3:*** Participate in and implement local and regional programs that promote water conservation as a means of improving water supply and water.	This policy is intended to promote water conservation.	Consistent: The project would not preclude opportunities to participate in and implement local and regional programs that promote water conservation as a means of improving water supply and water.
County of Monterey (inland areas)	Greater Monterey Peninsula Area Plan	Public Services and Facilities	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, and Ryan Ranch–Bishop Interconnection Improvements	***Policy GMP-5.2:*** Each development proposal shall be evaluated to determine the extent to which such development may help further the County's park and recreation facility goals, objectives, and policies.	This policy is intended to protect and enhance the County's parklands and recreational facilities.	Consistent: MPWSP construction would temporarily affect parklands and restrict access to recreational facilities. However, project components that could disrupt park access and recreation would be buried underground. As a result, the project would not adversely affect long-term park access or use.
County of Monterey (inland areas)	Monterey County Code	Chapter 10.72 – Desalinization Treatment Facility	MPWSP Desalination Plant	***Sections 10.72.010*** et seq. establishes: No person, firm, water utility, association, corporation, organization, or partnership, or any city, county, district, or any department or agency of the State shall commence construction of or operate any Desalination Treatment Facility (which is defined as a facility which removes or reduces salts from water to a level that meets drinking water standards and/or irrigation purposes) without first securing a permit to construct and a permit to operate said facility. Such permits shall be obtained from the Director of Environmental Health of the County of Monterey, or his designee, prior to securing any building permit.	This policy is intended to regulate ownership of desalination facilities within Monterey County.	*Pursuant to CPUC's October 31, 2012 decision affirming Administrative Law Judge (ALJ) Gary Weatherford's September 12, 2012 proposed "Decision Declaring Preemption of County Ordinance and the Exercise of Paramount Jurisdiction", this ordinance is not applicable to the MPWSP.*
County of Monterey (inland areas)	Monterey County General Plan	Land Use	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Carmel Castroville Pipeline, Carmel Valley Pump Station, Main System–Hidden Hills and Ryan Ranch–Bishop Interconnection Improvements	***Policy LU-5.7:*** Industrially designated areas shall be compatible with surrounding land uses.	This policy is intended to ensure compatibility of adjacent land uses.	Consistent: The proposed MPWSP Desalination Plant would be sited next to the existing Monterey County Landfill and the MRWPCA Regional Wastewater Treatment Plant, and would not preclude continued use of nearby lands for agriculture and grazing.
County of Monterey (inland areas)	Monterey County General Plan	Land Use	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System–Hidden Hills and Ryan Ranch–Bishop Interconnection Improvements	***Policy LU-1.11:*** Development proposals shall be consistent with the General Plan Land Use Map designation of the subject property and the policies of this plan.	This policy is intended to ensure development proceeds in a manner that is compatible with existing and anticipated future development.	Consistent: Lands with a General Plan land use designation of Permanent Grazing may need to be redesignated to accommodate the proposed MPWSP Desalination Plant unless the County issues a Use Permit, which would occur through the requisite local planning and permit review processes. The proposed MPWSP Desalination Plant would be compatible with the adjacent Monterey County Landfill and the MRWPCA Regional Wastewater Treatment Facility.

TABLE 4.8-2 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO LAND USE AND RECREATION

Project Planning Region	Applicable Plan	Plan Element/ Section	Subject Project Components	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Policies and Programs
County of Monterey (inland areas)	Monterey County General Plan	Public Services	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System–Hidden Hills and Ryan Ranch–Bishop Interconnection Improvements	**Policy PS-13.2:** All new utility lines shall be placed underground, unless determined not to be feasible by the Director of the Resource Management Agency.	This policy is intended to protect the existing visual and architectural character of the planning area.	Consistent: All proposed pipelines would be placed below ground.
County of Monterey (coastal zone)	North County Land Use Plan	Land Use and Development	Source Water Pipeline and new Desalinated Water Pipeline	***Key Policy 4.3.4:*** All future development within the North County coastal segment must be clearly consistent with the protection of the area's significant human and cultural resources, agriculture, natural resources, and water quality.	This key policy is intended to provide long-term resource management and protection.	Potentially Inconsistent: Impacts related to cultural, agricultural, and biological resources and water quality, are discussed in EIR/EIS Sections 4.15, 4.16, 4.6, and 4.3, respectively. Specifically, please refer to **Tables 4.15-6, 4.16-2, 4.6-2,** and **4.3-5** for additional discussion of the project's conformity with applicable North County Land Use Plan policies related to cultural, agricultural, terrestrial biological resources, and water quality, respectively. In all but one instance related to compatibility with established land use policies regarding biological resources (i.e., Impact 4.6-4), potential land use policy and regulation conflicts are resolvable with the implementation of recommended mitigation. Because this policy pertains to topics other than land use and recreation and is addressed elsewhere in the EIR/EIS, it is not discussed further in Section 4.8.
County of Monterey (coastal zone)	North County Land Use Plan	Land Use and Development	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 4.3.5.4:*** Where there is limited land, water, or public facilities to support development, coastal dependent agriculture, recreation, commercial and industrial uses shall have priority over residential and other non-coastal dependent uses.	This policy is intended to preserve and protect opportunities for coastal-related and coastal-dependent uses within coastal areas where the availability of land, water, or public facilities is limited.	Consistent: The Source Water Pipeline and new Desalinated Water Pipeline are coastal-dependent or coastal-related, due to their reliance on coastal areas for water intake and transmission. These facilities would be buried below ground and would not otherwise limit use of land, water, or public facilities in the coastal zone.
County of Monterey (coastal zone)	North County Land Use Plan	Land Use and Development	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.5.6:*** Industrial uses shall be located near major transportation facilities and population centers. The only industrial facilities appropriate for the area are coastal or agriculture-dependent industries which do not demand large quantities of fresh water and contribute low levels of air and water pollution. Industries not compatible with the high air quality needed for the protection of agriculture shall be restricted.	This policy is intended to protect air quality and water availability in the coastal zone, and the agricultural operations dependent thereon.	Consistent: The Source Water Pipeline is coastal dependent. The Source Water Pipeline and new Desalinated Water Pipeline are public utilities. They would be buried below ground and they would have no long-term impact on air quality or traffic within the North County Land Use Plan area, nor would they require large quantities of fresh water. Traffic and air quality impacts are addressed in EIR/EIS Sections 4.9 and 4.10, respectively. Water availability impacts are addressed in EIR/EIS Sections 4.3 and 4.4. Specifically, please refer to **Tables 4.9-2, 4.10-3, 4.3-5,** and **4.4-6** for additional discussion of the project's conformity with applicable North County Land Use Plan policies related to these resource areas, respectively.
County of Monterey (coastal zone)	North County Land Use Plan	Land Use and Development	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 4.3.5.8:*** Development within the North County coastal zone shall be consistent with the land uses shown on the plan map and as described in the text of this plan.	This policy is intended to protect coastal resources and direct development is a way that is consistent with the Coastal Act.	Consistent: The Source Water Pipeline and new Desalinated Water Pipeline would be sited along existing roadway and railroad rights-of-way and would not preclude land uses shown on the plan map.
County of Monterey (coastal zone)	North County Land Use Plan	Land Use and Development	Source Water Pipeline and new Desalinated Water Pipeline	***Specific Policy 4.3.6 F4:*** A basic standard for all new or expanded industrial uses is the protection of North County's natural resources. Only those industries determined to be compatible with the limited availability of freshwater and the high air quality required by agriculture shall be allowed. New or expanded industrial facilities shall be sited to avoid impacts on agriculture of environmentally sensitive habitats.	This policy is intended to protect air quality and water availability in the coastal zone, and the agricultural operations dependent thereon.	Consistent: The Source Water Pipeline and new Desalinated Water Pipeline are not industrial facilities, would be buried below ground, and would have no long-term impact on natural resources, air quality, or water availability within the North County Land Use Plan area. Biological resources and air quality impacts are addressed in EIR/EIS

TABLE 4.8-2 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO LAND USE AND RECREATION

Project Planning Region	Applicable Plan	Plan Element/ Section	Subject Project Components	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Policies and Programs
County of Monterey (coastal zone) (cont.)						Sections 4.6 and 4.10, respectively. Water availability impacts are addressed in EIR/EIS Sections 4.3 and 4.4. Specifically, please refer to **Tables 4.6-2, 4.10-3, 4.3-5,** and **4.4-6** for additional discussion of the project's conformity with applicable North County Land Use Plan policies related to these resource areas, respectively.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Land Use	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Ryan Ranch–Bishop Interconnection Improvements	***Residential Land Use Policy B-1:*** The City of Seaside shall encourage land uses that are compatible with the character of the surrounding districts or neighborhoods and discourage new land use activities which are potential nuisances and/or hazards within and in close proximity to residential areas.	This policy is intended to minimize nuisance and hazards that could result from incompatible land uses.	<u>Consistent</u>: Project components subject to the Base Reuse Plan's Seaside planning area would be constructed at or below ground, and therefore would be compatible with existing land use character. Additional discussion of land use compatibility is presented in Section 4.14, Aesthetic Resources. The Ryan Ranch-Bishop Interconnection Improvements would be constructed below ground surface and would have no effect related to nuisance, hazard, or other land use compatibility issue.

SOURCES: City of Marina, 1982, 2000; City of Seaside, 2004b, 2013; FORA, 1997a; Monterey County, 1999, 2010.

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In all but one instance related to specific MPWSP components' compatibility with established land use policies related to biological resources (i.e., Impacts 4.6-4), potential land use policy and regulation conflicts are resolvable with the implementation of recommended mitigation. And in those instances in which potential conflicts could remain after mitigation is implemented, the proposed use would not be fundamentally inconsistent with intent of the respective site's established land use and zoning classification, nor would the effects substantially conflict with the public health, safety, and welfare criteria underlying most Use Permit decisions. Therefore, based upon the analyses presented herein, the local body overseeing land use and development decisions should be able to make the consistency findings necessary for Use Permit and/or CDP issuance.

Subsurface Slant Wells

The subsurface slant wells are proposed in a retired portion of the CEMEX sand mining operation in northern Marina. This area is identified on the land use plan as Habitat Reserve and Other Open Spaces, and zoned for Coastal Conservation and Development (CD) uses. According to the *City of Marina General Plan*, lands designated as Habitat Reserve and Other Open Spaces are "intended for permanent retention in open space to protect significant plants and wildlife inhabiting these areas" (City of Marina, 2000). The *City of Marina General Plan* recognizes the presence of the CEMEX sand mining facility and provides for the continuation, modification, and expansion of sand mining activities on the property in accordance with the provisions of the Local Coastal Program and Reclamation Plan (City of Marina, 2000). The *City of Marina Local Coastal Program* and zoning regulations provide for conditional approval of coastal-dependent industrial land uses, including, but not limited to surf zone and offshore sand extraction and dune mining, within the CD district (City of Marina, 1982; 2009). CalAm will need to obtain a CDP from the City of Marina for implementation of the subsurface slant wells. Per the above discussion of project consistency with applicable land use policies and regulations, the City of Marina should be able to make findings in support of CDP issuance for the subsurface slant wells. With the requisite CDP, the proposed subsurface slant wells would not conflict with land use plan and zoning designations.

MPWSP Desalination Plant

The MPWSP Desalination Plant would be located in unincorporated Monterey County. The site is identified as Permanent Grazing (PG) in both the *Monterey County General Plan* Land Use Map and County Zoning Map. Per the *Monterey County General Plan*, the PG designation allows a range of uses that conserve and enhance productive grazing lands. According to the *Monterey County General Plan*, greenhouse operations notwithstanding, building coverage on PG lands shall be limited to 5 percent of the property (Monterey County, 2010). The Monterey County Zoning Ordinance provides for public and quasi-public uses, such as public utilities, within PG districts provided applicants obtain a Use Permit (Monterey County, 1997). The minimum building site is 40 acres. Per the zoning regulations, projects such as the MPWSP involving building coverage in excess of the 5 percent limit would require a variance. Chapter 21.72 establishes and outlines the process for obtaining a variance. The variance notwithstanding, per the above discussion of project consistency with applicable land use policies and regulations, the

County of Monterey should be able to make findings in support of Use Permit issuance for the MPWSP Desalination Plant. Through adherence to the variance process, and with the Zoning Administrator's finding that the criteria for a variance have been met, the MPWSP Desalination Plant would not conflict with land use plan and zoning designations.

Pipelines North of Reservation Road

Conveyance facilities north of Reservation Road would include the Source Water Pipeline and optional alignment, new Desalinated Water Pipeline and optional alignment, Castroville Pipeline and optional alignments, Brine Discharge Pipeline (including the Brine Mixing Box and appurtenances), and Pipeline to CSIP Pond. These facilities would be constructed within portions of Marina and unincorporated Monterey County. Pipeline alignments would generally follow the TAMC right-of-way, Monterey Peninsula Recreational Trail, and existing road rights-of-way. Land uses along these pipeline alignments are identified on the land use plans as Habitat Reserve and Other Open Space Preserve (coastal Marina); Agricultural Preservation and Light Industrial (coastal Monterey County); and Mixed Use, Low Density Residential, Farmland, and Permanent Grazing (inland Monterey County). Zoning designations for these lands include Coastal Conservation and Development (coastal Marina); Resource Conservation, Coastal Agricultural Preservation, and Light Industrial (coastal Monterey County); and Permanent Grazing, Farmland, Mixed Use, Low Density Residential, and Public/Quasi-Public uses (inland Monterey County). Marina (Section 17.06.020.D) and Monterey County (Sections 20.64.160.C and 21.64.160.C) zoning regulations allow public utility distribution and transmission facilities in all zone districts. Marina and Monterey County require project applicants to obtain one or more approvals (such as a Use Permit or a CDP, and/or planning commission review) prior to construction of any portion of the pipelines. Per the above discussion of project consistency with applicable land use policies and regulations, the City of Marina and Monterey County should be able to make findings in support of Use Permit and/or CDP authorization, as applicable, for MPWSP pipelines north of Reservation Road. With the requisite Use Permit and/or CDP, as applicable, the proposed pipelines would not conflict with underlying land use plan and zoning designations.

ASR-5 and ASR-6 Wells

The proposed ASR-5 and ASR-6 Wells would be constructed along the east side of General Jim Moore Boulevard in Seaside, entirely on federally-owned land within the former Fort Ord military base. As noted previously, land use decisions in this area are under the jurisdiction of the U.S. Army and are guided by the *Real Property Master Plan*. The U.S. Army analyzed the potential land use effects of the proposed ASR-5 and ASR-6 Wells in the *Final Environmental Assessment and Finding of No Significant Impact, Monterey Bay Regional Water Project – Aquifer Storage and Recovery*. The *Environmental Assessment* concluded the proposed ASR-5 and ASR-6 Wells would have no impact with respect to conflict with any applicable land use plans, policies, or regulations (RBF Consulting, 2010). As these components would be constructed entirely within lands under federal jurisdiction and not subject to local land use regulation, no determination regarding potential conflicts with established land use and zoning designations is provided.

Pipelines South of Reservation Road

Conveyance facilities south of Reservation Road would include the new Transmission Main and optional alignment, ASR pipelines, Main System–Hidden Hills Interconnection Improvements, and Ryan Ranch–Bishop Interconnection Improvements. These components would cross portions of the cities of Marina, Seaside, Monterey, and unincorporated Monterey County. The proposed pipeline alignments would generally follow the Monterey Peninsula Recreational Trail, TAMC right-of-way, and other road rights-of-way. Land use plan designations for property within or adjacent to these pipeline alignments range from Parks and Open Space Preserve, to Military and Industrial. Zoning along the pipeline alignments also spans a similarly broad range of designations. As noted for conveyance pipelines north of Reservation Road, Marina and Monterey County zoning regulations allow public utilities in all zone districts with a Use Permit, Coastal Development Permit, and/or planning commission review. Zoning regulations for the cities of Seaside and Monterey also allow major public utilities in all such districts with a Use Permit. Per the above discussion of project consistency with applicable land use policies and regulations, the cities of Seaside and Monterey should be able to make findings in support of Use Permit authorization, as applicable, for MPWSP pipelines south of Reservation Road. With the requisite Use Permit, as applicable, the proposed pipelines would not conflict with underlying land use plan and zoning designations.

Carmel Valley Pump Station

The Carmel Valley Pump Station would be constructed on lands in unincorporated Monterey County. The proposed site, which is located approximately 240 feet south of Carmel Valley Road (west of Rancho San Carlos Road), has land use plan and zoning designations Residential – Low Density (LDR/2.5-D-S-RAZ). The Carmel Valley Pump Station would be consistent with the Residential – Low Density land use classifications. The County of Monterey Zoning Ordinance for Inland Areas (Section 21.14.050.B) allows public and quasi-public uses, including public utility facilities, in the LDR zone with a Use Permit. Public utility facilities include facilities for the “production, storage, transmission, distribution, and recovery of water…” (21.06.910). Per the above discussion of project consistency with applicable land use policies and regulations, Monterey County should be able to make findings in support of Use Permit authorization. With the requisite Use Permit, the proposed pump station would not conflict with underlying land use plan and zoning designations.

4.8.2.4 Special Districts

Transportation Agency for Monterey County (TAMC)

Portions of the new Desalinated Water Pipeline, new Transmission Main, and Castroville Pipelines, and their respective optional alignments, would be located generally within the TAMC right-of-way. For these segments an easement or encroachment permit may be required from TAMC (refer to Chapter 3, Project Description). TAMC has identified potential future plans to utilize its existing right-of-way to extend commuter service in Salinas and passenger service to and from the Monterey Peninsula. CalAm and the MWPSP design engineer are coordinating with TAMC to ensure the proposed facilities do not conflict with potential future TAMC plans for use of the right-of-way.

Monterey Peninsula Water Management District

The Monterey Peninsula Water Management District (MPWMD) manages the production of surface water supplies from the Carmel River and groundwater pumped from municipal and private wells in Carmel Valley and the Seaside coastal area. The MPWMD's jurisdictional boundary generally corresponds to CalAm's Monterey District service area, with the exception of an area north and east of Seaside and Sand City that is within the MPWMD's jurisdiction but is served by the Marina Coast Water District. MPWMD was created by the California Legislature in 1977 as a special district and approved by local voters in 1978. MPWMD regulates water allocation, delivery, and use within its jurisdictional boundary. The location of the facility or water source, quantity of water, and delivery determine the type of permit required from MPWMD and conditions of approval. Even if the proposed treatment facility is not located within MPWMD jurisdiction, the delivery and use of the desalinated water produced by the project ("product water") within the jurisdiction is still subject to MPWMD regulations. That is, if any of the proposed facility components are within the MPWMD's jurisdictional boundary, CalAm must apply for an amendment to its Water Distribution System Permit (MPWMD, 2001). Portions of the proposed project would be within the MPWMD jurisdiction; therefore, CalAm would be required to obtain an amendment to its Water Distribution System Permit for project operation.

4.8.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to land use, land use planning, and recreational resources if it would:

- Physically divide an established community;
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect;
- Conflict with any applicable habitat conservation plan or natural community conservation plan;
- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.
- Disrupt or preclude public access to or along the coast.

4.8.4 Approach to Analysis

The analysis considers the proposed project's potential to conflict with applicable plans, policies, and regulations governing land use decisions. This analysis addresses the potential for temporary impacts on land use and recreation during construction, as well as long-term impacts resulting from project siting and operations. Where the project would result in a significant impact or conflict with a regulatory requirement, mitigation measures are recommended to reduce the impact significance and/or resolve or minimize the potential regulatory conflict.

4.8.5 Direct and Indirect Effects of the Proposed Project

Based on the nature of the proposed project, the following significance criteria are not addressed further in the section:

> ***Physically divide an established community.*** All of the linear facilities that are proposed as part of the project (e.g., pipelines) would be located underground, and the overlying areas would be restored after construction. Aboveground structures that would be constructed include the subsurface slant wells vaults and housings, MPWSP Desalination Plant, the ASR-5 and ASR-6 Wells (pump houses), and the Carmel Valley Pump Station. None of the aboveground facilities would divide an established community or established land uses. Thus, the criterion related to the division of an established community is not applicable to the proposed project and is not discussed further.
>
> ***Conflict with any applicable habitat conservation plan or natural community conservation plan.*** This criterion is addressed in Impact 4.6-8 in Section 4.6, Terrestrial Biological Resources, of this EIR/EIS.
>
> ***Increase the use of existing neighborhood and regional parks or other recreational facilities.*** The project does not propose to construct new homes or businesses and would not increase the number of residents in the project area. The project would occur in the vicinity of and could be noticeable to users of recreational facilities, such as golf courses, parks, and ballfields. The project would not directly affect these types of facilities. Nor would the project be expected to cause permanent displacement of users from these facilities, such that other facilities experienced an increased level of use that resulted in physical impacts. Therefore, this significance criterion is not applicable to the proposed project and is not discussed further.
>
> ***Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.*** The proposed project does not include recreational facilities and would not result in the need for new or expanded recreational facilities. Thus, the significance criterion related to the construction or expansion of recreational facilities is not applicable to the proposed project and is not discussed further.
>
> ***Disrupt or preclude public access to or along the coast during project operations.*** The proposed project does not involve any permanent aboveground facilities whose operations would affect coastal public access. All project facilities proposed within the Coastal Zone would be either buried below ground surface or sited on private land, outside of any public access areas. With coastal erosion, there is potential for the beach to retreat landward to the subsurface slant wells (Site 1), which could affect access along the shoreline. This issue is addressed further in Section 4.2, Geology, Soils, and Seismicity, which calls for coastal erosion monitoring and removal of portions of the slant well that could encroach into the public beach, prior to anticipated date of beach exposure. No other project components have potential to affect public access. Therefore, the significance criterion related to project operations impacts on public access to or along the coast is not discussed further.

Table 4.8-3 summarizes the MPWSP's impacts and significance determinations related to land use and recreation.

TABLE 4.8-3
SUMMARY OF IMPACTS – LAND USE AND RECREATION

Impacts	Significance Determinations
Impact 4.8-1: Consistency with applicable plans, policies, and regulations related to land use and recreation that were adopted for the purpose of mitigating an environmental effect.	LS
Impact 4.8-2: Disrupt or preclude public access to or along the coast during construction.	LSM
Impact 4.8-C: Cumulative impacts related to land use and recreation.	LSM

NOTES:
LS = Less than Significant
LSM = Less than Significant impact with mitigation

Impact 4.8-1: Consistency with applicable plans, policies, and regulations related to land use and recreation that were adopted for the purpose of mitigating an environmental effect. (*Less than Significant*)

Section 15125(d) of the CEQA Guidelines requires analysis of potential "conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect." There are numerous plans, policies, and regulations that either are implicated by relevant significance criteria or were adopted for environmental purposes and thus are evaluated under the appropriate topical sections of this EIR/EIS. As an example, Section 4.6, Terrestrial Biological Resources, evaluates whether the project would conflict with the provisions of an adopted Habitat Conservation Plant or similar plan. As such, consistency with applicable Habitat Conservation Plans is discussed in Section 4.6.

This section evaluates overall project consistency with applicable plans, policies, and regulations pertaining to land use and recreation. The applicable plans, policies, and regulations related to these topics are presented in **Table 4.8-2**, above. The table also establishes the relationship of the plan, policy, or regulation to avoiding or mitigating an environmental effect. The range of issues represented in **Table 4.8-2** include: land use compatibility and protection of land use values, development clustering, protection of public access and recreational opportunities, and coastal-dependency and priority land uses in the coastal zone. As presented in the table, the project would not be expected to conflict with plans, policies, and regulations related to these issue areas. Because many of the proposed pipelines would be installed along recreational trails, bike routes, and pedestrian paths, additional discussion regarding the proposed project's effects on recreational resources is provided below to support the analysis of project consistency with plans, policies, and regulations pertaining to recreational resources. Recognizing that the affected jurisdiction has the ultimate authority over consistency determinations, the table was prepared in consultation with the potentially affected jurisdictions. A more focused discussion of potential effects on public access to and along the coast is provided in **Impact 4.8-2**, below.

Construction activities associated with the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, Castroville Pipeline, Ryan Ranch–Bishop Interconnection Improvements, ASR pipelines, and their respective optional alignments, would overlap geographically with recreational trails, bicycle routes, and pedestrian pathways and could directly affect the use of such recreational facilities during the construction period. As discussed in Section 4.9, Traffic and Transportation (Impact 4.9-5), pipeline construction activities, including vehicle ingress and egress, equipment and materials staging, trenching, and stockpiling, could disrupt established bicycle and pedestrian facilities located along the pipeline alignments. However, since pipeline construction would proceed at a rate of 150 to 250 feet per day, the total duration of disturbance at any one location would generally be 1 to 2 weeks. Upon completion of construction, the areas disturbed during pipeline installation activities would be returned to their approximate pre-construction condition.

Construction of subsurface slant wells would occur within the CEMEX sand mining facility. The wells would be constructed approximately 500 feet landward of the back of beach. No work on the beach is proposed. Given their locations within a former sand mining site, landward of existing mining activities, subsurface slant well construction would not be expected to disrupt recreational beach use in the area. See **Impact 4.8-2** for additional discussion.

The plans, policies, and regulations related to land use and recreation in **Table 4.8-2**, above, reflect the long-term visions of the respective jurisdictions with respect to land use and development and are not directly relevant to temporary construction activities. Further, construction-related effects on adjacent land uses and on recreational facilities would be temporary and no long-term disruptions would result. None of the project components would substantially conflict with plans, policies, or regulations that were adopted for the purpose of avoiding or mitigating an adverse environmental effect related to land use or recreation. Therefore, the proposed project would have a less-than-significant effect with respect to land use and recreational policy conflicts.

Impact Conclusion

Based upon an initial review of consistency, the MPWSP would not be expected to conflict with applicable land use policies related to land use and recreation that were adopted for the purpose of avoiding or mitigating an environmental effect. Although construction of the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, and the Ryan Ranch–Bishop Interconnection Improvements, and ASR pipelines could affect recreational facilities, any disruptions would be temporary and limited to the construction phase. Therefore, the proposed project would not substantially conflict with plans, policies related to land use or recreation. The impact would be less than significant.

Mitigation Measures

None proposed.

Impact 4.8-2: Disrupt or preclude public access to or along the coast during construction. (*Less than Significant with Mitigation*)

The National Marine Sanctuaries Act, the California Coastal Act, and local coastal programs, among other planning and regulatory documents applicable to the project area, each emphasize the importance of maintaining public access and recreation opportunities to and along the coast. As noted in Impact 4.8-1 and Section 4.9, Traffic and Transportation (Impact 4.9-5), project construction would temporarily disrupt transportation routes in the project area, some of which are used for recreation (e.g., Monterey Peninsula Recreational Trail). Potential effects on such resources are not reanalyzed here. Rather, this impact evaluates the potential for project construction to disrupt existing vertical (i.e., between land and shore) and lateral (i.e., along the shoreline) access within the project area. An impact related to vertical or lateral access would be significant if project construction activities were to temporarily or permanently preclude the public’s utilization of established vertical or lateral coastal public accessways.

Project components proposed for construction in locations within the Coastal Zone include the subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main. The Source Water Pipeline, and new Desalinated Water Pipeline are proposed for areas where no coastal public access impacts would occur; there is no vertical access in the vicinity of the Source Water Pipeline, and the new Desalinated Water Pipeline would be constructed well inland (approximately 0.7 to 0.9 miles) of the nearest vertical accessway. The remaining project components would be constructed outside of the Coastal Zone boundary, in areas where no potential effects on vertical or lateral public access would occur. As such, this section evaluates the potential effects on project construction on vertical and lateral access in the vicinity of the subsurface slant wells and the new Transmission Main.

Subsurface Slant Wells

The subsurface slant wells are proposed for the CEMEX property, which is located west of Highway 1, in northern Marina. There is no vertical public access within the CEMEX facility. Although use levels are low, the beach seaward of the CEMEX site is used by the public; the nearest vertical public accessways are located 1 mile south at Marina Dunes Preserve and 1.25 miles north at the Salinas River National Wildlife Refuge. All of the subsurface slant well construction activities would occur on private CEMEX property, approximately 500 feet inland of the beach. While some of this work may be visible from the publicly accessible beach, none would occur on the beach or in areas that would otherwise disrupt or preclude lateral access along the shore. As a result, construction of the subsurface slant wells would have a less-than-significant impact related to public access to or along the coast.

New Transmission Main

The segment of the new Transmission Main proposed within the Coastal Zone would be constructed within or adjacent to the TAMC right-of-way or the Monterey Peninsula Recreational Trail. Along the proposed new Transmission Main alignment to the north, the Monterey Peninsula Recreational Trail and TAMC right-of-way run north-south adjacent to Fort Ord Dunes State Park; the State Park provides public opportunities for vertical access. In this area, the Monterey Peninsula

Recreational Trail serves as a primary bicycle and pedestrian access route from Marina, Sand City, and Seaside to the park. The proposed new Transmission Main and optional alignment would intersect three Fort Ord Dunes State Park entrances. From north to south, these include the Beach Range Road access, the 8th Street access, and the Divarty Street/1st Street access.

At Beach Range Road, the Fort Ord Dunes State Park is accessible via the at-grade intersection with the Monterey Peninsula Recreational Trail. Pipeline construction at the Beach Range Road/Monterey Peninsula Recreational Trail intersection would impede access into the park. At 8th Street, the park is accessible via bridge over the Monterey Peninsula Recreational Trail and TAMC right-of-way. The new Transmission Main would be constructed beneath the bridge and would not impede park access. At Divarty Street/1st Street, the park is accessible via a tunnel beneath the TAMC right-of-way and Monterey Peninsula Recreational Trail. The new Transmission Main would be constructed beneath the bridge and would not impede park access. At Divarty Street/1st Street, the park is accessible via a tunnel beneath the TAMC right-of-way and Monterey Peninsula Recreational Trail. The new Transmission Main would be constructed atop the tunnel, alongside the trail. However, temporary tunnel closures during pipeline installation over the tunnel would be required for public safety reasons.

Pipeline construction activities would progress at a rate of 150 to 250 feet per day. As such, construction-period impacts at park entrances would typically be limited to a period of one or two weeks. During this period, the public's ability to access Fort Ord Dunes State Park through the above-listed entrances would be impeded. Temporary closures of these entrances would affect access into the Park at specific locations. However, other entrances would remain open and public access to and use of existing vertical and lateral public accessways within Fort Ord Dunes State Park would not be obstructed. Following construction, the affected Park entrance areas would be returned to their approximate pre-construction condition. No permanent effects on park access would result.

The effects of new Transmission Main construction on public access to vertical and lateral public accessways within Fort Ord Dunes State Park would be significant. **Mitigation Measure 4.9-1, Traffic Control and Safety Assurance Plan**, would require the preparation and implementation of a traffic control safety plan that would apply to all project construction activities that could affect the public right-of-way, including roads and trails leading into Fort Ord Dunes State Park, and include measures that would provide for continuity of vehicular, pedestrian, and bicyclist access. With implementation of Mitigation Measure 4.9-1, the effects of new Transmission Main construction on public access would be reduced to a less-than-significant level.

Impact Conclusion

Construction-related impacts on public access to or along the coast would be significant for the new Transmission Main. These impacts could be reduced to a less-than-significant level with implementation of the mitigation measure identified below.

Mitigation Measures

Mitigation Measure 4.9-1 applies to all MPWSP facilities and associated construction activities; however, with respect to disruptions to coastal public access, only construction of the proposed new Transmission Main and optional alignment would require implementation of this measure to reduce impacts to a less-than-significant level.

Mitigation Measure 4.9-1: Traffic Control and Safety Assurance Plan.

(See Section 4.9, Traffic and Transportation, Impact 4.9-1, for description.)

4.8.6 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects.

Impact 4.8-C: Cumulative impacts related to land use and recreation. (*Less than Significant with Mitigation*)

As analyzed in Section 4.8.5, above, the proposed project would not divide an established community, increase the use of existing neighborhood parks or other recreational facilities, include or require the construction of recreational facilities, or disrupt or preclude public access to or along the coast (operations phase); therefore, it could not cause or contribute to any cumulative impact related to these issues. The potential for the proposed project to individually or cumulatively conflict with an applicable habitat conservation plan or natural community conservation plan is addressed in Section 4.6, Terrestrial Biological Resources, and is not addressed in this section.

The geographic scope of potential cumulative impacts on land use and recreation encompasses the lands and recreational resources that would be affected by proposed project construction. The timeframe during which the proposed project could contribute to cumulative land use and recreation effects includes the construction phase. A significant cumulative impact on land use and recreation would result if the construction-phase effects of the MPWSP, combined in space and time with those of cumulative projects, would create a conflict with applicable land use plans or policies or to impede coastal public access.

As discussed in Impact 4.8-1, the proposed project would disrupt use of and/or access to recreational facilities within the project area, which could result in a conflict with applicable land use plans, policies, and regulations related to protecting public access to such facilities (see Table 4.8-2). However, these effects would be temporary, mainly limited to the construction period, and no long-term effects would result. Because the applicable land use plans, policies, and regulations pertaining to public access and recreational opportunities reflect the long-term visions of the respective jurisdictions with respect to land use and development, they are not directly relevant to temporary construction activities. Therefore, the proposed project would not substantially conflict with any plans, policies, or regulations related to land use or recreation that were adopted for the purpose of avoiding or mitigating an environmental effect. The residual impacts on public access and recreational opportunities following the completion of construction would be negligible, if any. Therefore, the proposed project would have a less than significant contribution to the cumulative impact related to conflicts with plans, policies, and regulations adopted to protect public access or recreational facilities.

As discussed in Impact 4.8-2, proposed project construction would temporarily obstruct specific Fort Ord Dunes State Parks entry points, and thus disrupt public access to existing vertical and lateral coastal accessways within the park. The Fort Ord Dunes Campground project (No. 46 in Table 4.1-2) is the only cumulative project whose effects could combine with those of the proposed project to further impact coastal public access within the park. The implementation schedule remains unknown. However, if the two projects were constructed at the same time or in sequence, the duration of disruption to Beach Range Road access and the Divarty Street/1st Street access points could be extended. As discussed in Impact 4.8-2, the impacts of the proposed project would be temporary, limited to the construction phase, and affected areas would thereafter be returned to their approximate pre-construction condition. During the construction period, alternative access entry points into the park would remain open, and vertical and lateral access within the park would not be impacted; however, the cumulative impact resulting from more than one project affecting coastal public access would be significant. Following implementation of **Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan)**, the contribution of the proposed project to this potentially significant cumulative impact would be reduced to a level that is less than significant because signage would be posted in advance of and during construction to notify bicyclists and pedestrians of construction activity and advise them about detour routes, and construction schedules would minimize impacts during periods of heavy recreational use.

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4.9 Traffic and Transportation

As a result of comments received on the January 2017 Draft EIR/EIS, revisions have been made to this EIR/EIS section. Those changes include:

- *Revisions to Mitigation Measures 4.9-1, Traffic Control and Safety Assurance Plan, and 4.9-6, Roadway Rehabilitation Program.*

This section analyzes the potential impacts on traffic, transportation, and circulation that could result from implementation of the Monterey Peninsula Water Supply Project (MPWSP or proposed project). The analysis is based on estimates of workers and vehicles associated with construction and operation of the various components of the proposed project; California Department of Transportation (Caltrans) data on state highway traffic volumes; Transportation Agency for Monterey County (TAMC) data on local roadway traffic volumes; a field reconnaissance by a professional traffic engineer; and review of available maps of transit routes, bike routes, and recreational paths. The analysis focuses primarily on construction-related impacts because most impacts on traffic and transportation would occur during project construction. However, impacts related to long-term project operations and maintenance activities are also discussed.

4.9.1 Setting/Affected Environment

The study area for the evaluation of project impacts on traffic and transportation is comprised of the regional highways and local roadways in the project vicinity. It includes the cities of Marina, Sand City, Seaside, and Monterey, and unincorporated areas of Monterey County. Construction workers and construction vehicles would use regional highways and local roadways to transport materials and equipment and excavated spoils and fill material to and from the construction work areas. In addition, construction workers would install approximately 21 miles of pipeline within or adjacent to roadways and recreational trails. There are no MBNMS resources that would be affected by impacts identified in this section; all impacts related to traffic and transportation would occur outside of MBNMS boundaries. Therefore, MBNMS resources are not described in the environmental setting/affected environment.

4.9.1.1 Regional Roadways

Regional transportation within Monterey County, and within the project area, is supported by a system of highways, including U.S. Highway 101 (Highway 101) and several state routes (Highways 1, 68, 156, 183, and 218). These roadways provide regional access to the project area, the rest of Monterey County, and beyond. These roadways and their associated traffic volumes are summarized below, using the most recent data published by Caltrans (Caltrans, 2015).

Highway 101 is a multi-lane freeway that connects to San Jose and points north and San Luis Obispo and points south. Regional traffic on Highway 101 connects to the project area via interchanges at Highway 156 in Prunedale and Highway 68 in Salinas. The average daily traffic volume on Highway 101 ranges from about 83,700 vehicles north of the Highway 156 interchange; from 58,900 to 73,900 vehicles between Highway 156 and Highway 68; and about 58,500 vehicles south of Highway 68.

Highway 1 varies from a two-lane surface state highway (with at-grade intersections) to a multi-lane freeway (with ramp interchanges). Highway 1 runs north-south directly through the project area, providing direct access to construction work areas in Marina and Seaside, and connecting with regional highways such as Highway 156 in Castroville, Highway 218 in Seaside and Del Rey Oaks, and Highway 68 in Monterey. The average daily traffic volume on Highway 1 ranges from 42,000 to 47,000 vehicles between Highway 156 and Marina; and from 50,000 to 83,000 vehicles between Marina and the Monterey southern city limits.

Highway 68, also known as the Monterey-Salinas Highway, is a surface highway connecting Monterey with Salinas.[1] It is primarily a two-lane road, but there are four-lane segments as well as segments with a center two-way left-turn median. The intersections on Highway 68 at Highway 218–Monterra Road, Ragsdale Drive, and York Road (where turning movements by project-generated trips would occur) are signalized with separate turn lanes. The average daily traffic volume on Highway 68 ranges from 21,800 to 29,000 vehicles between the interchanges with Highway 1 in Monterey and with Reservation Road in Spreckels.

Highway 156 is a predominantly two-lane highway connecting Highway 101 with Highway 1 near Castroville. At Castroville Road it widens to four lanes and becomes a freeway, with interchanges at Highway 183 (Merritt Street) and Highway 1. The average daily traffic volume on Highway 156 ranges from 29,000 to 31,000 vehicles between Highway 1 and Highway 101.

Highway 183, also referred to as Merritt Street in the town of Castroville and Market Street in the city of Salinas, is a predominantly two-lane surface highway connecting Castroville (Highway 1) with Salinas (Highway 101); there are segments with four lanes or a center two-way left-turn median in Castroville. The average daily traffic volume on Highway 183 ranges from 12,000 to 38,200 vehicles between Highway 1 and Highway 101.

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1 Highway 68 (Holman Highway) also connects Carmel with Pacific Grove, and overlaps with Highway 1 between Carmel and Monterey.

Highway 218, also known as Canyon Del Rey Boulevard, is a surface highway connecting Highway 1 (at a freeway interchange) with Highway 68. It has four lanes (plus turn lanes) through Seaside, narrowing to two lanes east of Fremont Street. The average daily traffic volume on Highway 218 ranges from 12,200 to 23,000 vehicles between Highway 1 and Del Rey Oaks, and from 13,000 to 14,600 vehicles between Del Rey Oaks and Highway 68.

4.9.1.2 Local Roadways

The project area has a network of roads that serve various purposes. *Arterial streets* are designed to carry the traffic of local and collector streets to and from freeways and other major streets, generally providing direct access to nonresidential properties. *Collector streets* are designed to move traffic between arterials to local roadways. *Local roads* generally provide direct access to residential land uses. The roadways that would be most affected by project construction activities (and, to a lesser extent, project operations) are primarily two-lane roads, although some potentially affected roadways have four travel lanes (two in each direction).

Table 4.9-1 presents roadway characteristics (e.g., number of travel lanes, bike lanes, parking availability, public transit service, etc.) for the local roadways that would be directly affected by project construction activities (i.e., installation of pipelines within road rights-of-way).

4.9.1.3 Railroads

Amtrak provides passenger rail service in Monterey County. The Coast Starlight, which has daily northbound and southbound departures (with Seattle and Los Angeles as the final destinations), serves Salinas. The Union Pacific Railroad (UPRR) provides freight service in Monterey County.

The TAMC owns a 13-mile segment of railroad right-of-way between Castroville (where it connects with the UPRR) and Monterey (where it terminates at Cannery Row). Known as the Monterey Branch Line, the right-of-way passes through the cities of Marina and Seaside as well as the former Fort Ord military base. In Seaside and Monterey, several portions of the TAMC right-of-way have been paved over to accommodate recreational trails.

4.9.1.4 Public Transit

The Monterey-Salinas Transit (MST) line provides bus service within northern Monterey County and southern Santa Cruz County. In Monterey County, bus service is provided between the cities of Monterey and Salinas, Marina and Watsonville, Salinas and Watsonville, and south from Salinas to Gonzales. In addition, the MST also provides bus service within the cities of Marina, Monterey, Pacific Grove, and Seaside. Bus routes within and around the project area include Routes 2, 7, 8, 10, 11, 12, 14, 16, 18, 19, 21, 22, 24, 27, 28, 56, 69, 70, 71, 74, 75, 93, 94, Jazz A, Jazz B, and Jazz C (MST, 2016). **Table 4.9-1**, above, indicates the project area roadways that are shared with public transit routes.

TABLE 4.9-1
CHARACTERISTICS OF ROADS THAT COULD BE DIRECTLY AFFECTED BY PROJECT CONSTRUCTION ACTIVITIES[a]

Roadway / Segment	No. of Travel Lanes	Average Daily Traffic Volumes[b]	Bike Route?	On-Street Parking?	Public Transit Lines[c]	Figure Reference
Source Water Pipeline						
CEMEX Access Road: ● Under Highway 1 to Railroad R-O-W	2 lanes	--	No	No	N/A	Figure 3-3
Lapis Road: ▪ CEMEX access road to Del Monte Boulevard	2 lanes	–	No	No	N/A	Figure 3-4
Del Monte Boulevard: ▪ Lapis Road to Charles Benson Road	2 lanes	3,800	No	No	MST 27	Figure 3-4
Charles Benson Road: ▪ Del Monte Boulevard to MPWSP Desalination Plant	2 lanes	–	No	No	N/A	Figure 3-4 Figure 3-5
New Desalinated Water Pipeline						
Charles Benson Road: ▪ Del Monte Boulevard to MPWSP Desalination Plant	2 lanes	–	No	No	N/A	Figure 3-4 Figure 3-5
Del Monte Boulevard: ▪ Charles Benson Road to Lapis Road	2 lanes	3,800	No	No	MST 27	Figure 3-4
Lapis Road: ▪ Del Monte Boulevard to Del Monte Boulevard	2 lanes	–	No	No	N/A	Figure 3-4 Figure 3-6
Crossing of Marina Green Drive	2 lanes	--	No	No	N/A	Figure 3-6
Crossing of Beach Road	2 lanes	--	No	No	MST 16, 27	Figure 3-6
Crossing of Reservation Road	3 lanes	–	Yes	No	MST 16	Figure 3-7a
New Transmission Main						
Marina Drive ▪ Reservation Road to Reindollar Avenue	2 lanes	--	No	No	N/A	Figure 3-7a
Crossing of Palm Avenue	3 lanes	--	No	No	MST 27	Figure 3-7a
Lightfighter Drive ▪ 1st Avenue to General Jim Moore Boulevard	4 lanes (divided)	15,570	No	No	MST 12, 19, 75	Figure 3-8
General Jim Moore Blvd: ▪ Lightfighter Drive to s/o Coe Avenue / Eucalyptus Road	4 lanes (divided)	6,970 to 9,610	Yes	No	MST 12, 18, 75	Figure 3-8 Figure 3-9a
Carmel Valley Pump Station						
▪ Rancho San Carlos Road	2 lanes	--	No	No	N/A	Figure 3-10c
Ryan Ranch–Bishop Interconnection Improvements						
Ragsdale Drive: ▪ Highway 68 to Lower Ragsdale Drive	4 lanes	–	No	No	MST 8, 93	Figure 3-10a

TABLE 4.9-1 (Continued)
CHARACTERISTICS OF ROADS THAT COULD BE DIRECTLY AFFECTED BY PROJECT CONSTRUCTION ACTIVITIES

Roadway / Segment	No. of Travel Lanes	Average Daily Traffic Volumes[b]	Bike Route?	On-Street Parking?	Public Transit Lines[c]	Figure Reference
Ryan Ranch–Bishop Interconnection Improvements (cont.)						
Lower Ragsdale Drive: ▪ Ragsdale Drive to Wilson Road	2 lanes	–	Yes	No	N/A	
Wilson Road: ▪ Lower Ragsdale Drive to Citation Court	2 lanes	–	Yes	No	MST 8, 93	
Main System–Hidden Hills Interconnection Improvements						
Terra Grande Drive: ▪ Telerana Way to terminus	2 lanes	–	No	No	N/A	Figure 3-10b
Castroville Pipeline						
Crossing of Del Monte Avenue	2 lanes	–	No	No	N/A	Figure 3-12
Crossing of Neponset Road	2 lanes	--	No	No	N/A	Figure 3-11a
Castroville Pipeline Optional Alignment						
Merritt Street: ▪ Del Monte Avenue to Haro Street	2 lanes	--	No	No	MST 28	Figures 3-11b and 3-13
Haro Street: ● Merritt Street to Rec Trail	2 lanes	--	No	No	N/A	
Nashua Road: ● Rec Trail to UPRR	2 lanes	--	No	No	N/A	

NOTES:

a The exact locations of the proposed pipelines relative to the roadways listed in this table (i.e., within the travel lanes, within the right-of-way but not within the travel lanes, or outside the right-of-way) are not known at this time. To inform the reader of potential impacts (as described under Impact 4.9-2), the information in the table is based on the conservative assumption that roadway travel lanes would be affected.

b Average daily traffic volumes provided by the Transportation Agency for Monterey County (TAMC, 2015).
– = no data available

c Public transit information provided by Monterey-Salinas Transit (MST, 2016).
N/A = not applicable

d MST routes along this segment of Fremont Street include Routes 2, 12, 14, 18, 19, 21, 22, 24, 56, 69, 93, 94, and Jazz A/B/C.

SOURCE: ESA, 2016.

4.9.1.5 Bicycle Routes and Pedestrian Paths

Within Monterey County, bicycle travel for both commuting and recreational purposes is common. A network of bicycle facilities, including Class I (bicycle paths), Class II (bicycle lanes, striped in roads), and Class III (bicycle routes without striping), extend throughout the county (as well as the project area) and are frequently located along the right-of-way of roadways or railroads. For example, the 18-mile-long Class I Monterey Peninsula Recreational Trail (also known as the Monterey Bay Coastal Bike Path) originates at Merritt Street in Castroville and heads south along Del Monte Boulevard to Canyon Del Rey Boulevard in Seaside. From there the trail follows the TAMC right-of-way and terminates in Pacific Grove near Forest Avenue. As part of the proposed project, approximately 9 miles of underground pipeline would be installed within or adjacent to the

TAMC right-of-way, with 6 of the 9 miles located alongside the Monterey Peninsula Recreational Trail. There are numerous other designated bike routes, some with designated bike lanes, in and around the project area. **Table 4.9-1** indicates the project area roadways that have bikeways.

The level of pedestrian facilities (e.g., sidewalks versus edge-of-road paths) and volumes of pedestrians vary depending on location.

4.9.2 Regulatory Framework

This section provides an overview of notable federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as “regulatory requirements”) relevant to traffic and transportation, and analyses of the proposed project’s conformity with such regulatory requirements, without mitigation.

4.9.2.1 Federal and State

California Department of Transportation

Caltrans is responsible for planning, designing, constructing, operating, and maintaining all state-owned roadways in Monterey County. In California, Caltrans implements federal interstate highway standards. Caltrans requires that project proponents seeking to conduct construction activities within a state-owned right-of-way obtain a Caltrans encroachment permit.

California Coastal Commission

The California Coastal Act (Public Resources Code Section 30000 et seq.) provides for the long-term management of lands within California’s coastal zone boundary. Of primary relevance to traffic and transportation are Coastal Act policies concerning minimizing vehicle miles traveled, protecting public access, and maintaining recreational opportunities within the coastal zone. A preliminary assessment of project consistency with these priorities provided here. Final determinations regarding project consistency are reserved for the Coastal Commission. With respect to vehicle miles traveled, any increase in the number of vehicle trips associated with operation of project components in the coastal zone negligible. Maintenance activities would include periodic inspections and repairs, but would not generate a substantial number of new vehicle trips. With respect to public access and recreation, project construction may have short-term indirect effects on shoreline access (i.e., increased traffic and lane closures) during the construction period. However, pipelines would be buried underground and would not substantially affect long-term public access to or along the coast. For these reasons, the project would be consistent with Coastal Act policies related to traffic and transportation.

4.9.2.2 Local

Transportation Agency for Monterey County

The TAMC is an independent association of local officials that oversees planning and funding of regional transportation improvements throughout Monterey County. The agency prepares the Regional Transportation Plan and oversees the implementation of its recommended improvements.

Association of Monterey Bay Area Governments

The Association of Monterey Bay Area Governments (AMBAG) is the federally-designated Metropolitan Planning Organization (MPO) for the tri-county Monterey Bay region. It is the lead agency responsible for developing and administering the transportation plans and programs that receive federal funds in Monterey, San Benito, and Santa Cruz Counties. As the MPO, AMBAG acts as a forum for cooperative decision-making in the development of transportation plans, programs, and recommendations. AMBAG also develops and maintains a regional travel-demand forecasting model used to plan regional transportation facilities and assess development proposals.

Local Jurisdictions

The incorporated cities of Monterey, Marina, Sand City, and Seaside have adopted General Plans, policies, and capital improvement programs that regulate development and transportation improvements within their jurisdictions. The cities administer encroachment permits for work performed within the rights-of-way of their respective roadways.

Monterey County Public Works Department

The Monterey County Public Works Department is responsible for maintaining roads, bridges, and related facilities within the unincorporated area of the county. The Public Works Department works with the Monterey County Planning Department to review land development applications for compliance with local and state regulations (i.e., private roads, driveways, and county-maintained roads). The Public Works Department administers encroachment permits for work performed within county rights-of-way (such as underground utility work, and driveways and road approaches); permits street closures; and issues transportation permits for county roads.

4.9.2.3 Applicable Regional and Local Land Use Plans, Policies, and Regulations

Table 4.9-2 identifies the traffic- and transportation-related regional and local land use plans, policies, and regulations relevant to the MPWSP that were adopted for the purpose of avoiding or mitigating an environmental effect, and indicates project consistency with such plans, policies, and regulations. Where the analysis concludes the proposed project would not conflict with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes the proposed project would be potentially inconsistent with the applicable plan, policy, or regulation, the reader is referred to the specific impact discussion in Section 4.9.5, Direct and Indirect Effects of the Proposed Project, where the potential inconsistency is addressed in more detail. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

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TABLE 4.9-2
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TRAFFIC AND TRANSPORTATION

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Infrastructure	Subsurface Slant Wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 3.3***: The intent of the General Plan Transportation and Infrastructure Element is to ensure that the requirements for transportation, water supply, wastewater collection and treatment, storm water drainage, and solid-waste disposal generated by existing and future development are adequately provided for. It is also the intent of this section to ensure, to the maximum extent possible, that the provision of such services does not have a deleterious effect on either natural resources or the quality of life of residents of Marina or other potentially affected areas. The major concerns of this section are outlined below: 6. Protect existing and future residential areas from through-traffic that creates safety, noise, and pollution problem.	This policy is intended to protect residential areas from traffic-induced safety hazards, disruptive noise levels, and air pollutants.	Consistent: The subsurface slant wells would not be staffed. Routine and periodic site visits from CalAm personnel would be minimal (no more than 4 roundtrips or 8 one-way trips per day) and would not generate traffic in residential areas. Pipelines would be periodically inspected and repaired, as needed, but would not generate a substantial number of new vehicle trips.
City of Marina (coastal zone)	City of Marina Local Coastal Program Land Use Plan	Policies	Subsurface Slant Wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 1***: Insure access to and along the beach, consistent with the recreational needs and environmental sensitivity of Marina Coastal area.	This policy is intended to maintain public access to and along the shoreline.	Consistent: Project construction may have short-term indirect effects on shoreline access (i.e., increased traffic and lane closures) during the construction period. None of the project components proposed within the coastal zone would permanently preclude public access to or along the coast. Refer to Table 4.2-6 for additional discussion of the project's conformity with applicable Marina Local Coastal Land Use Plan policies related to beach erosion.
City of Seaside (coastal zone and inland areas)	City of Seaside General Plan	Circulation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Policy C-1.7***: Reduce impacts on residential neighborhoods from truck traffic and related noise.	This policy is intended to protect residential areas from traffic congestion and disruptive noise levels.	Potentially Inconsistent: Construction-related traffic increases could result in substantial adverse effects on traffic conditions along neighborhood (residential) streets in Seaside. This issue is addressed further in Impact 4.9-1, which identifies a mitigation measure whose implementation would minimize or avoid this potential inconsistency. Traffic-related noise is addressed in EIR/EIS Section 4.12, Noise and Vibration. (Refer to **Table 4.12-3** for additional discussion of the project's conformity with applicable Seaside General Plan policies related to noise and vibration.)
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Circulation	MPWSP Desalination Plant, Source Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, new Desalinated Water Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills Interconnection Improvements, Ryan Ranch-Bishop Interconnection Improvements	***Policy C-3.4***: Strategies to encourage travel in non-peak hours shall be supported.	This policy is intended to avoid traffic congestion.	Potentially Inconsistent: Project construction would temporarily increase traffic and congestion during peak hours. This issue is addressed in Impact 4.9-1, which identifies a mitigation measure whose implementation would minimize or avoid this potential inconsistency.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Circulation	MPWSP Desalination Plant, Source Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, new Desalinated Water Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills Interconnection Improvements, and Ryan Ranch-Bishop Interconnection Improvements	***Policy C-4.3***: The needs of bicyclists and pedestrians, as well as provisions for utilities and drainage, shall be considered and, where appropriate, provided in all public rights-of-way in a manner that minimizes impacts on adjacent land uses.	This policy is intended to protect bicycle and pedestrian modes of transportation.	Consistent: Project construction may have short-term indirect effects on pedestrian and bicycle use within public rights-of-way (i.e., increased traffic and lane closures) during the construction period. However, all project components proposed within public rights-of-way would ultimately be buried underground and would not substantially impede use of these rights-of-way for long-term pedestrian and bicycle use.
County of Monterey	Castroville Community Plan	Economic Development	Castroville Pipeline	**Policy 12.2:** The road improvements, flood control improvements, and slough enhancements included in the Community Plan shall be implemented to result in a smooth flowing circulation system, an increase in redevelopment potential, and an attractive public amenity along the Tembladero Slough that will attract new quality businesses and visitors.	This policy is intended to ensure that road improvements, flood control improvements, and slough replacements result in a smooth flowing circulation system.	Consistent: The Castroville Pipeline would be buried underground and would not substantially affect the circulation system.

TABLE 4.9-2 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TRAFFIC AND TRANSPORTATION

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
Fort Ord Reuse Authority (Seaside and Monterey County)	Fort Ord Reuse Plan	Circulation	New Transmission Main, ASR Conveyance Pipelines, ASR Pump-to-Waste Pipeline, and Ryan Ranch–Bishop Interconnection Improvements	***Pedestrian and Bicycles Policy B-1*:** Each jurisdiction shall provide and maintain an attractive, safe and comprehensive bicycle system. ***Program B-1.2*:** Each jurisdiction shall review new development to provide bicycle system facilities consistent with the Reuse Plan and the Bicycle System Plan concurrently with development approval.	This policy is intended to maintain a safe bicycle system.	<u>Consistent</u>: Project construction may have short-term indirect effects on the existing bicycle network within the former Fort Ord area (i.e., increased traffic and lane closures) during the construction period. However, all project components potentially affecting the bicycle network would ultimately be buried underground and would not substantially impede long-term use of the bicycle network.
Fort Ord Reuse Authority (Seaside and Monterey County)	Fort Ord Reuse Plan	Circulation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Ryan Ranch–Bishop Interconnection Improvements	***Transportation Demand Management Policy A-1*:** Transportation demand management (TDM) programs shall be encouraged. ***Program A-1.3*:** Require new development to incorporate design features that will strengthen TDM programs.	This policy is intended to provide adequate service levels for the local transportation system.	<u>Consistent</u>: Implementation of the proposed project would result in a negligible long-term increase in traffic volumes.
Fort Ord Reuse Authority (Seaside and Monterey County)	Fort Ord Reuse Plan	Circulation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Ryan Ranch–Bishop Interconnection Improvements	***Land Use and Transportation Objective A*:** A transportation system that supports the planned land use development patterns. ***Program A-1.2*:** Each jurisdiction with lands at former Fort Ord shall require new developments to conduct a traffic analysis to determine impacts on traffic conditions, require measures such as TDM programs and traffic impact fees to mitigate these impacts.	This policy is intended to provide adequate service levels for the local transportation system.	<u>Consistent</u>: Implementation of the proposed project would result in a negligible long-term increase in traffic volumes.

SOURCE: City of Marina, 1982, 2000; City of Seaside, 2004; FORA, 1997; Monterey County, 2007, 2010

4.9.3 Evaluation Criteria

The proposed project would have a significant impact related to traffic and transportation if it would:

- Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel as well as relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;
- Conflict with an applicable congestion management program, including but not limited to level of service (LOS) standards, travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;

Further discussion of significance criteria follows Table 4.9-2.

- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that would cause substantial safety risks;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access;
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities;
- Substantially increase traffic safety hazards;
- Cause substantial damage or wear of public roadways by increased movement of heavy vehicles; or
- Result in parking interference during construction.

Based on the nature of the proposed project, no impacts related to the following significance criteria would result for the reasons described below:

- ***Conflict with the applicable congestion management program, including LOS standards.*** The operating conditions of a roadway, as measured by the level of traffic congestion experienced by motorists, are described as the level of service (LOS). There are six service levels ranging from LOS A as the best operating condition (free-flow conditions with limited travel delays) to LOS F as the worst-case condition (congested or overloaded roadways with extremely long delays). LOS A through D generally represent traffic volumes that are less than roadway capacity, while LOS E represents at-capacity conditions. The LOS of a particular roadway segment is based on several factors, including traffic volumes, number of lanes, type of intersection control, speed and travel time, traffic interruptions, and driving comfort and convenience. LOS standards established by jurisdictions and agencies are intended to regulate long-term (permanent) traffic increases associated with new development and do not apply to short-term (temporary) traffic increases that occur during construction. As discussed under Impact 4.9-8, long-term operations of the MPWSP Desalination Plant would generate approximately 33 round-trips (66 one-way trips) per day (60 commute trips and 6 midday trips). The greatest long-term increase in vehicle trips from MPWSP Desalination Plant operations would occur on Charles Benson Road. Based on existing traffic conditions and the industrial nature of the surrounding land uses on Charles Benson Road, the projected increase is well within the roadway carrying capacity of this two-lane road and would not affect traffic conditions. None of the other proposed facilities (subsurface slant wells, ASR-5 and ASR-6 Wells, and Carmel Valley Pump Station) would be routinely staffed. However, routine and periodic site visits by CalAm staff to monitor operations and conduct maintenance would be required. The long-term operations and maintenance requirements for these proposed project facilities would be similar to those required for existing CalAm operations in the Monterey District service area. They would be incorporated into existing routine site visits and activities and would not generate a significant number of new vehicle trips. Any additional increase in the number of vehicle trips associated with these facilities would be negligible. Pipelines would be periodically inspected and repaired, as necessary, but otherwise would not generate vehicle traffic. Because implementation of the proposed project would not result in substantial long-term, ongoing effects related to traffic and congestion, typical LOS calculations were not performed for this traffic analysis, and county LOS standards were not used to evaluate potential project impacts. Temporary traffic impacts caused by the project were analyzed (see Impacts 4.9-1 and 4.9-2) using a non-LOS-based methodology (see Section 4.9.4 Approach to Analysis). No impact related to conflicts with the applicable congestion management program or LOS standards would occur, and this significance criterion is not discussed further.

- ***Changes in air traffic patterns.*** Construction and operation of the proposed project facilities would not affect air traffic patterns. Neither the construction equipment proposed for use during project construction nor the proposed facilities, once completed, would exceed the height restrictions established by nearby airports (Monterey Peninsula Airport and Marina Municipal Airport). Therefore, this significance criterion is not applicable and is not discussed further.

- ***Permanent increases in traffic safety hazards due to a design feature or incompatible uses.*** The proposed project would not introduce new design features (e.g., new facilities or obstructions within public roadways) or alter existing features (e.g., road realignment). In addition, traffic generated during operation of the proposed project would be compatible with the mix of vehicle types (autos and trucks) currently using regional and local roadways. Therefore, this significance criterion is not applicable and is not discussed further. Temporary increases in traffic safety hazards during project construction are addressed under Impact 4.9-3, below.

- ***Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.*** In general, adopted policies, plans, and programs pertaining to public transit, bicycle, and pedestrian travel are intended to be used for long-term planning purposes and do not apply to construction activities. Implementation of the proposed project would not permanently change the existing or planned transportation network in the affected jurisdictions in Monterey County, nor would the proposed project directly or indirectly eliminate alternative modes of transportation, transportation corridors, or facilities (e.g., bicycle paths, lanes, or routes; bus turnouts or bus routing; walkways, sidewalks, or crosswalks, etc.). Further, the proposed project would not prevent the use of any roads on which public transit routes operate, nor would it generate increased traffic volumes on roads used as public transit routes to a degree that would cause lengthy delays for transit riders or eliminate and/or reduce access to such transit facilities. Therefore, the proposed project would not conflict with policies, plans, or programs related to transit, bicycle, or pedestrian travel. Temporary impacts related to alternative modes of transportation during project construction are addressed in Impact 4.9-3 (increased traffic safety hazards) and Impact 4.9-5 (temporary disruptions to public transit during construction).

- ***Result in substantial traffic delays or increase safety hazards for commercial vessels, or result in the permanent displacement of commercial vessels.*** Implementation of the MPWSP would not involve construction or operations activities that would require the use of ocean vessels, and would not involve the temporary or permanent placement of any facilities in the Monterey Bay or adjacent harbors. Therefore, implementation of the proposed project would have no effect on commercial vessel traffic or movement. Therefore, this criterion is not applicable to the proposed project and is not discussed further.

4.9.4 Approach to Analysis

Most impacts on traffic and transportation would occur during project construction. As a result, the following analysis is focused primarily on construction-related effects, although impacts related to long-term project operations and maintenance activities are addressed under Impact 4.9-8. As discussed below in Section 4.9.5, Direct and Indirect Effects of the Proposed Project, project operations and maintenance activities would generate a very small increase in traffic (up to 10 workers per shift at the MPWSP Desalination Plant, and a negligible increase for all other proposed facilities compared to existing CalAm operations in the Monterey District service area), thus eliminating the need to perform LOS calculations (because of the reasonable expectation that LOS would not be adversely affected).

Construction of the project components would temporarily affect segments of the roadway network in the project area by increasing traffic volumes on roads that provide access to the construction work areas. There is also a potential for project construction to result in temporary lane closures and detours, particularly along pipeline segments that require construction within vehicle travel lanes or road shoulders. Construction-related traffic and changes in traffic circulation patterns could have an impact on traffic flow and traffic safety conditions on area roads, including roads used for recreation and coastal access (see Section 4.8, Land Use, Land Use Planning and Recreation). Construction characteristics, including crew sizes, techniques, materials and equipment, and the rate of construction, were used to estimate the number of vehicles that would be required for construction of the individual facilities.

This analysis relies on published information regarding roadway characteristics and existing traffic volumes; preliminary construction information provided by the project applicant (CalAm); and estimates of daily vehicle trips for construction activities and for long-term maintenance and operations, augmented by the professional traffic analyst’s knowledge of the project area. Existing traffic volumes on project area roadways were gathered from the Caltrans website (for state highways) and the TAMC website (for local roads). Estimates of project-related traffic increases were added to existing traffic volumes, and a qualified expert in traffic analysis evaluated the effect of that percent increase on traffic flow, based upon professional experience and knowledge of the relevant roadways. The following factors were considered in the evaluation of construction-related traffic impacts on area roadways: (1) workers would commute to and from the construction work areas earlier and/or later than project-related construction truck trips (i.e., those trips would not happen at the same time); (2) daily traffic volumes on public roads typically vary from day-to-day (by about 10 percent, ±5 percent), and any increased traffic within the typical daily fluctuation would not be perceptible to the average motorist; and (3) although construction-related vehicle trips would increase traffic volumes on local, two-lane roadways in the project area, the increase would not substantially affect traffic flow if the traffic volumes remained within the carrying capacity of the roads (roughly 10,000 to 15,000 vehicles per day for two-lane roads, depending on design features).

Construction activities associated with the subsurface slant wells and MPWSP Desalination Plant would occur 24 hours a day, 7 days a week, as would construction activities during 8 weeks of development and completion of the proposed ASR-5 and ASR-6 Wells. To the extent feasible, pipeline installation and construction of all other proposed facilities would be conducted during daytime hours. However, some construction might be performed at night to expedite construction and meet the project schedule. The following describes typical construction methods to be used for proposed project components:

- Construction of non-linear facilities (e.g., the MPWSP Desalination Plant, Carmel Valley Pump Station, the proposed ASR injection/extraction wells) would typically involve site preparation, grading and excavation, equipment and materials deliveries, concrete formwork, building construction, installation of support equipment, installation of security fencing, and revegetation. Earthmoving activities would be performed using heavy construction equipment such as bulldozers, backhoes, cranes, and graders. Construction workers would pour concrete footings for tanks, lay pipelines, and make pipeline connections.
- Most pipelines would be installed using conventional open-trench construction techniques. However, trenchless technologies would be used where open-cut trenching is not feasible or desirable (e.g., state highway crossings, stream and drainage crossings, and areas with high utility congestion). It is anticipated that trenchless technologies would be used in at least seven locations (see Section 3.3.5.2 in Chapter 3, Project Description).
- Upon the completion of construction activities, roadways (and all other areas) disturbed during pipeline installation would be restored to their preconstruction condition.

Construction activities would generate daily vehicle trips by construction work crews commuting to and from work each day; trucks hauling equipment and materials to the construction work areas; and trucks hauling excavated spoils and construction debris offsite for disposal. The number of construction-related trips would vary during the 24 months of project construction depending on the construction phase, the facilities being constructed, and the nature of the construction activities taking place. The impact analysis presented below is based on the estimated maximum number of daily and hourly vehicle trips that would be generated during periods of peak construction activity, based on a worst-case scenario that assumes all project components would be constructed simultaneously. Due to the construction durations associated with individual project components, the duration of overlap between components would be limited, and the actual traffic volumes generated during project construction are likely to be lower than described below.

The average pace of work for pipeline installation would be 150 to 250 feet per day. It is estimated that project construction activities would generate an estimated 25,110 cubic yards of excavated spoils and construction materials that would be hauled to the Monterey Materials Recovery Facility to be recycled or the Monterey Peninsula Landfill for disposal. The average capacity for haul trucks would be 10 cubic yards per truck. Vehicle trips associated with spoils hauling and placement would occur throughout the 24-month construction duration. However, as noted below, not all of the proposed facilities are anticipated to generate excess spoils and construction debris that would be hauled offsite.

Construction equipment and materials associated with the subsurface slant wells, MPWSP Desalination Plant, and ASR injection/extraction wells would be stored within the respective construction work areas or at designated staging areas (see **Table 3-4** in Chapter 3, Project Description). Construction equipment and materials associated with pipeline installation would be stored along the pipeline easements and at nearby designated staging areas. To the extent feasible, parking for construction and worker vehicles would be accommodated within the construction work areas and on adjacent roadways.

The discussion of construction-related impacts relies on the following: estimates of construction worker vehicle trips and construction truck trips associated with each project component, and assumptions related to potential overlap of individual facility construction. As described in Chapter 3, Project Description, Section 3.3.10, all project components would be constructed over the 24-month project construction period, with multiple facilities being constructed concurrently. The final construction schedule and phasing could vary from that presented in this assessment. However, the construction scenarios described in this section (estimated vehicle trips for the construction of each project component and the combined impacts associated with concurrent construction of multiple components) are conservative and have been developed to allow for a reasonable assessment of the nature and magnitude of potential construction impacts.

4.9.5 Direct and Indirect Effects of the Proposed Project

Table 4.9-3 summarizes the proposed project's impacts and significance determinations related to traffic and transportation.

TABLE 4.9-3
SUMMARY OF IMPACTS – TRAFFIC AND TRANSPORTATION

Impacts	Significance Determinations
Impact 4.9-1: Temporary traffic increases on regional and local roadways due to construction-related vehicle trips.	LSM
Impact 4.9-2: Temporary reduction in roadway capacities and increased traffic delays during construction.	LSM
Impact 4.9-3: Increased traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways during construction.	LSM
Impact 4.9-4: Impaired emergency access during construction.	LSM
Impact 4.9-5: Temporary disruptions to public transportation, bicycle, and pedestrian facilities during construction.	LSM
Impact 4.9-6: Increased wear-and-tear on the designated haul routes used by construction vehicles.	LSM
Impact 4.9-7: Parking interference during construction.	LSM

TABLE 4.9-3 (Continued)
SUMMARY OF IMPACTS – TRAFFIC AND TRANSPORTATION

Impacts	Significance Determinations
Impact 4.9-8: Long-term traffic increases on regional and local roadways during project operations and maintenance.	LS
Impact 4.9-C: Cumulative impacts related to traffic and transportation.	SU

NOTES:
LS = Less than Significant impact, no mitigation proposed
LSM = Less than Significant impact with Mitigation
SU = Significant and Unavoidable, even with implementation of feasible mitigation

4.9.5.1 Construction Impacts

Impact 4.9-1: Temporary traffic increases on regional and local roadways due to construction-related vehicle trips. (*Less than Significant with Mitigation*)

Construction-related vehicle traffic could result in increased congestion and delays for vehicles, which could cause temporary conflicts with local jurisdictions' measures of effectiveness for the performance of the circulation system. Because multiple project components would be constructed simultaneously, and the construction traffic for many of the components would use the same roads, the total number of construction-related vehicle trips along common construction access routes could be higher than the maximum number of daily vehicle trips associated with a single project component. Thus, the analysis below considers the estimated maximum number of daily construction-related vehicle trips and the construction access routes for each project component, the potential for the timing of construction of the various project components to overlap, and the total combined number of additional vehicle trips along the common access routes resulting from all concurrent construction activities. Project components that would increase traffic along common roads or road segments are grouped by area, and the effects of the combined construction-related traffic increases are compared to existing traffic volumes and road carrying capacities. Note that because total trips would be dispersed over various roads and road segments (based on the origins and/or destinations of those trips), the total trips generated by project components in a given area do not necessarily represent the total increase in vehicle trips on any single common road or road segment.

Construction-related traffic occurring on access roadways in the "peak" direction on weekdays from 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. would coincide with peak-period commuter traffic and therefore would have the greatest potential to impede traffic flow. Traffic volume increases caused by project construction would be most noticeable on local, two-lane roads (and, conversely, would be less noticeable on regional, multi-lane roads like Highway 1 and major arterials like Del Monte Boulevard). Project-generated truck trips would be dispersed throughout the day, thus lessening the effect on peak-hour traffic. Drivers could experience delays if they were traveling behind a construction truck. This analysis conservatively assumes that construction workers would commute to and from the worksites during the morning and afternoon peak traffic hours.

Table 4.9-4 presents the estimated number of daily construction worker trips and truck trips generated by construction activities for each project component. The total trips for each area reflect the maximum increase in traffic during periods of peak construction activities; peak construction periods are limited to the maximum duration of overlap among project components (i.e., the duration of the facility with the shortest construction duration in each area).

TABLE 4.9-4
ESTIMATED MAXIMUM DAILY VEHICLE TRIPS DURING PROJECT CONSTRUCTION

Project Facility	Duration (months)	Maximum Daily Totals		Daily Vehicle Trips			
				Workers[a]		Trucks	
		Workers	Trucks	Round-trip	One-Way	Round-trip	One-Way
North of Reservation Road (maximum duration of peak construction activities = 4 month)							
Subsurface Slant Wells[b]	15	30	20	33	66	20	40
MPWSP Desalination Plant	24	88	55	97	194	55	110
Source Water Pipeline	6	25	12	28	56	12	24
Brine Discharge Pipeline and Brine Mixing Box	9	12	6	14	28	6	12
Castroville Pipeline	4	12	6	14	28	6	12
New Desalinated Water Pipeline	8	25	12	28	56	12	24
TOTAL TRIPS[c] =		192	111	214	428	111	222
Marina/Seaside Area (maximum duration of peak construction activities = 5 months)							
New Transmission Main	8	25	12	28	56	12	24
ASR Pipelines (ASR Conveyance, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline)	5	25	12	28	56	12	24
ASR Injection/Extraction Wells	12	25	12	28	56	12	24
TOTAL TRIPS[c] =		75	36	84	168	36	72
Monterey Area (maximum duration of peak construction activities = 3 months)							
Ryan Ranch–Bishop Interconnection Improvements	4	12	6	14	28	6	12
Main System–Hidden Hills Interconnection Improvements	3	12	6	14	28	6	12
TOTAL TRIPS[c] =		24	12	28	56	12	24
Carmel Valley Area							
Carmel Valley Pump Station	6	12	6	14	28	6	12

NOTES:
[a] Worker round-trips are increased by 10 percent to account for miscellaneous midday trips by some of the workers.
[b] Accounts for the nine permanent subsurface slant wells that would be constructed *after* construction of the test slant well and completion of the pilot program.
[c] Because total trips would be dispersed over various roads and road segments (based on the origins and/or destinations of those trips), the total trips generated by project components in a given area do not necessarily represent the total increase in vehicle trips on a single common road or road segment.

SOURCE: ESA, 2016.

Project Components North of Reservation Road

Assumptions about the construction duration, timing, and work hours for the components below are described in Section 3.3.9, Construction Schedule.

Subsurface Slant Wells. Construction access for the subsurface slant wells in the coastal area of northern Marina would use Highway 1, Del Monte Boulevard, Lapis Road, Reservation Road, and the existing CEMEX access road located off Lapis Road. As shown in **Table 4.9-4**, up to 30 workers would be needed to construct the intake facilities located in the coastal area. Construction workers would generate up to 33 round-trips (66 one-way trips) per day (60 commute trips and six midday trips). Materials and equipment deliveries would generate an estimated 20 truck round-trips (40 one-way trips) per day. There would be no truck trips related to the offsite disposal of excess spoils because excavated sand would be spread onsite.

MPWSP Desalination Plant. Construction vehicles would most likely use Highway 1, Del Monte Boulevard, Reservation Road, and Charles Benson Road to access the MPWSP Desalination Plant site. As shown in **Table 4.9-4**, up to 88 workers would be needed to construct the MPWSP Desalination Plant. Construction workers would generate up to 97 round-trips (194 one-way trips) per day (176 commute trips and 18 midday trips). Materials and equipment deliveries would generate an estimated 55 truck round-trips (110 one-way trips) per day. There would be no truck trips related to the offsite disposal of excess spoils because excavated soils not used for backfill would be spread or reused onsite.

Source Water Pipeline. Construction-related traffic would access the work areas for the 2.2-mile Source Water Pipeline using Highway 1, Del Monte Boulevard, Reservation Road, and Charles Benson Road. As shown in **Table 4.9-4**, construction of the Source Water Pipeline is estimated to require up to 25 workers. Construction workers would generate up to 28 round-trips (56 one-way trips) per day (50 commute trips and six midday trips). This project component would generate an estimated 12 truck round-trips (24 one-way trips) per day for materials and equipment deliveries and hauling of excess spoils and construction debris offsite.

Brine Discharge Pipeline and Brine Mixing Box. Construction traffic for the 2.3-mile Brine Discharge Pipeline and Brine Mixing Box and appurtenances would access the pipeline alignment and MRWPCA property using Highway 1, Del Monte Boulevard, Reservation Road, and Charles Benson Road. As shown in **Table 4.9-4**, construction of the pipeline and Brine Mixing Box would require up to 12 workers. Construction workers would generate up to 14 round-trips (28 one-way trips) per day (24 commute trips and four midday trips). This project component would generate an estimated six truck round-trips (12 one-way trips) per day for materials and equipment deliveries and hauling of excess spoils and construction debris offsite.

Castroville Pipeline. Construction traffic for the 4.5-mile-long Castroville Pipeline would access the pipeline alignment using Highway 1, Highway 156, Highway 183 (Merritt Street/Castroville Road), Monte Road, and Charles Benson Road. As shown in **Table 4.9-4**, construction of this project component would require up to 12 workers. Construction workers would generate up to 14 round-trips (28 one-way trips) per day (24 commute trips and four midday trips). This project component would generate an estimated six truck round-trips (12 one-way trips) per day for materials and equipment deliveries and hauling of excess spoils and construction debris offsite.

New Desalinated Water Pipeline. Construction traffic for the 3.3-mile new Desalinated Water Pipeline would access the pipeline alignment using Highway 1, Del Monte Boulevard, Lapis Road, Reservation Road, Beach Road, and Charles Benson Road. As shown in **Table 4.9-4**, installation of this pipeline would require up to 25 workers. Construction workers would generate up to 28 round-trips (56 one-way trips) per day (50 commute trips and six midday trips). This project component would generate an estimated 12 truck round-trips (24 one-way trips) per day for materials and equipment deliveries and hauling of excess spoils and construction debris offsite.

Combined Construction-Related Traffic Increases in North Marina Area

Based on assumptions developed by a professional traffic engineer regarding the origins and destinations of trips by construction workers and haul trucks, and the dispersal of construction traffic on area roadways, the estimated maximum increases in vehicle trips during peak construction periods on common regional roads and road segments are as follows:

- ***Highway 1 (north of Reservation Road):*** Traffic generated by concurrent construction of project components with trip origins and destinations in the Highway 1 and Highway 101 corridors north of Reservation Road would use this road. The total combined vehicle trips associated with the project components in this area (i.e., about 214 one-way worker vehicle trips per day, and about 112 one-way truck trips per day) represent an increase of up to about 0.8 percent above the current daily traffic volume (42,000 to 47,000 vehicles) on this road (Caltrans, 2015).
- ***Highway 1 (south of Reservation Road):*** Traffic generated by concurrent construction of project components with trip origins and destinations in the Highway 1 corridor south of Reservation Road would use this road. The total combined vehicle trips associated with the project components in this area (i.e., about 108 one-way worker vehicle trips per day, and 56 one-way truck trips per day) represent an increase of up to about 0.3 percent above the current daily traffic volume (50,000 to 83,000 vehicles) on this road (Caltrans, 2015).
- ***Reservation Road:*** Traffic generated by concurrent construction of project components with trip origins and destinations in the Highway 101 corridor southeast of the project area would use this road. The total combined vehicle trips associated with the project components in this area (i.e., about 108 one-way worker vehicle trips per day, and 56 one-way truck trips per day) represent a 0.6 to 2.8 percent increase above the current daily traffic volume on this road, which ranges from about 5,900 to 27,500 vehicles per day (TAMC, 2015).

Truck trips generated by concurrent construction activities would be dispersed throughout the day and over the area road network. The maximum increases in traffic resulting from concurrent construction of project components during peak periods of construction would fall within the daily fluctuations of traffic volumes and would not be noticeable to the average motorist on Highway 1 or on the higher-volume segments of Reservation Road. While the increased traffic would be noticeable by drivers on the lower-volume segments of Reservation Road, the traffic volumes would continue to be within the carrying capacity of this two-lane road (which is about

10,000 to 15,000 vehicles per day). Therefore, the impact would be less than significant for the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Castroville Pipeline, and new Desalinated Water Pipeline.

Project Components in Marina/Seaside Area

Assumptions about the construction duration, timing, and work hours for the components below are described in Section 3.3.9, Construction Schedule.

New Transmission Main. Depending on the location of each day's worksite, construction traffic for the 6-mile-long Transmission Main would access the pipeline alignment using different roads (e.g., Highway 1, Del Monte Boulevard, Reservation Road, Lightfighter Drive, 2nd Avenue, General Jim Moore Boulevard, Gigling Road, and 8th Street). As shown in **Table 4.9-4**, installation of this pipeline would require up to 25 workers. Construction workers would generate up to 28 round-trips (56 one-way trips) per day (50 commute trips and six midday trips). It is estimated that about 12 truck round-trips (24 one-way trips) per day (spread over the 9-hour workday) would be generated by materials and equipment deliveries and hauling of excess spoils and construction debris offsite.

ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline. Depending on the location of each day's construction work area, construction traffic for the three parallel 0.8-mile-long ASR pipelines (ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline) would access the work areas using Highway 1, Lightfighter Drive, Fremont Boulevard, Highway 68, Highway 218, and General Jim Moore Boulevard. As shown in **Table 4.9-4**, installation of these pipelines would require up to 25 workers. Construction workers would generate up to 28 round-trips (56 one-way trips) per day (50 commute trips and six midday trips). It is estimated that about 12 truck round-trips (24 one-way trips) per day (spread over the 9-hour workday) would be generated by materials and equipment deliveries and hauling of excess spoils and construction debris offsite.

ASR Injection/Extraction Wells (ASR-5 and ASR-6 Wells). Construction traffic for the proposed ASR injection/extraction wells would use Highway 1, Lightfighter Drive, Fremont Boulevard, Highway 68, Highway 218, and General Jim Moore Boulevard. As shown in **Table 4.9-4**, construction of the ASR injection/extraction wells would require up to 25 workers. Construction workers would generate up to 28 round-trips (56 one-way trips) per day (50 commute trips and six midday trips). Materials and equipment deliveries would generate an estimated 12 truck round-trips (24 one-way trips) per day. There would be no truck trips related to the offsite disposal of excess spoils because excavated soils not used for backfill would be spread or reused onsite.

Combined Construction-Related Traffic Increases in Marina/Seaside Area

Based on assumptions developed by a professional traffic engineer regarding the origins and destinations of trips by construction workers and haul trucks, and the dispersal of construction traffic on area roadways, the estimated maximum increases in vehicle trips during peak construction periods on common regional roads and road segments are as follows:

- ***Highway 1 (north of Fremont Boulevard / Del Monte Boulevard):*** Traffic generated by concurrent construction of project components in the Seaside area with trip origins and destinations in the Highway 1 and Highway 101 corridors north of Fremont Boulevard / Del Monte Boulevard would use this road segment. The vehicle trips associated with the project components in this area (i.e., about 84 one-way worker vehicle trips per day, and 36 one-way truck trips per day) represent an increase of up to about 0.2 percent above the current daily traffic volume (58,000 to 83,000 vehicles) on this road segment (Caltrans, 2015).
- ***Highway 1 (south of Fremont Boulevard / Del Monte Boulevard)*****:** Traffic generated by concurrent construction of project components in the Seaside area with trip origins and destinations in the Highway 1 corridor south of Fremont Boulevard / Del Monte Boulevard would use this road segment. The vehicle trips associated with the project components in this area (i.e., about 42 one-way worker vehicle trips per day, and 30 one-way truck trips per day) represent an increase of up to about 0.2 percent above the current daily traffic volume (50,000 to 77,000 vehicles) on this road segment (Caltrans, 2015).
- ***Other Common Roadways, including Highways 68 and 218*****:** The combined vehicle trips on other common roadways associated with the project components in the Seaside area (i.e., up to about 42 one-way worker vehicle trips per day, and 30 one-way truck trips per day) represent an increase of up to about 0.3 percent above the current daily traffic volume (21,800 to 29,000 vehicles) on Highway 68 (Caltrans, 2015), up to about 0.6 percent above the current daily traffic volumes (12,200 to 23,000 vehicles) on Highway 218 (Caltrans, 2015), and from 0.5 to 1.2 percent above the current daily volumes on non-state roadways, which range from about 5,900 to 15,570 vehicles per day (TAMC, 2015).

Truck trips generated by concurrent construction activities would be dispersed throughout the day and over the area road network. Although the combined traffic increases resulting from concurrent construction activities would fall within the daily fluctuations of traffic volumes for the highway and arterial roadways in the area and would not be noticeable to the average motorist, these traffic increases along lower-volume local and neighborhood (residential) streets in the Marina/Seaside area are considered to potentially result in substantial adverse effects. Therefore, the effect of construction-related traffic on traffic congestion is considered a potentially significant impact for the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and ASR-5 and ASR-6 Wells. However, with implementation of **Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan)**, the impact would be reduced to a less-than-significant level. The mitigation measure includes provisions for reducing construction-related traffic and traffic congestion impacts on local streets.

Project Components in Monterey Area

Assumptions about the construction duration, timing, and work hours for the components below are described in Section 3.3.9, Construction Schedule.

Ryan Ranch–Bishop Interconnection Improvements. Construction traffic for the Ryan Ranch–Bishop Interconnection Improvements would most likely use Highway 68, Ragsdale Drive, Lower Ragsdale Drive, and York Road to access the construction work area. As shown in **Table 4.9-4**, construction of this project component would require up to 12 workers. Construction workers would generate up to 14 round-trips (28 one-way trips) per day (24 commute trips and four midday trips). This project component would generate an estimated six truck round-trips (12 one-way trips) per day for materials and equipment deliveries and hauling of excess spoils and construction debris offsite.

Main System–Hidden Hills Interconnection Improvements. Construction traffic for the Main System–Hidden Hills Interconnection Improvements would use Highway 1, Carmel Valley Road, and Tierra Grande Drive to access the construction work areas. As shown in **Table 4.9-4**, construction of this project component would require up to 12 workers. Construction workers would generate up to 14 round-trips (28 one-way trips) per day (24 commute trips and four midday trips). This project component would generate an estimated six truck round-trips (12 one-way trips) per day for materials and equipment deliveries and hauling of excess spoils and construction debris offsite.

Combined Construction-Related Traffic Increases in Monterey Area

Based on assumptions developed by a professional traffic engineer regarding the origins and destinations of trips by construction workers and haul trucks, and the dispersal of construction traffic on area roadways, the estimated maximum increases in vehicle trips during peak construction periods on common regional roads and road segments are as follows:

- ***Highway 1 (north of Highway 68)*****:** Traffic generated by concurrent construction of project components with trip origins and destinations north of the project area would use this road. The vehicle trips associated with the project components in this area (i.e., about 28 one-way worker vehicle trips and 12 one-way truck trips per day) represent an increase of up to about 0.1 percent above the current daily traffic volume (58,000 to 83,000 vehicles) along this segment of Highway 1 (Caltrans, 2015).
- ***Highway 1 (south of Highway 68)*****:** Traffic generated by concurrent construction of project components with trip origins and destinations south of the project area would use this road. The vehicle trips associated with the project components in this area (i.e., about 14 one-way worker vehicle trips per day, and 6 one-way truck trips per day) represent less than a 0.1 percent increase above the current daily traffic volume (50,000 to 77,000 vehicles) along this segment of Highway 1 (Caltrans, 2015).
- ***Highways 68 and 218*****:** Traffic generated by concurrent construction of project components with trip origins and destinations east of the project area would use these roads. The vehicle trips associated with the project components in this area (i.e., up to about 14 one-way worker vehicle trips per day, and 6 one-way truck trips per day) represent an increase of up to about 0.1 percent above the current daily traffic volume (21,800 to 29,000 vehicles) on Highway 68, and up to about 0.2 percent above the current daily traffic volumes (12,200 to 23,000 vehicles) on Highway 218 (Caltrans, 2015).

As described above, truck trips generated by concurrent construction would be dispersed throughout the day and over the area road network. The combined traffic increases resulting from concurrent construction activities would fall within the daily fluctuations of traffic volumes for the regional highways and arterial roadways in the area and would continue to be within the carrying capacities of the two-lane roads (i.e., about 10,000 to 15,000 vehicles per day). The effect of construction-related traffic on traffic congestion would be a potentially significant impact for the Ryan Ranch-Bishop Interconnection Improvements and Main System-Hidden Hills Interconnection Improvements. However, with implementation of **Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan)**, the impact would be reduced to a less-than-significant level.

Traffic Increases in Carmel Valley Area

Carmel Valley Pump Station. Construction traffic for the Carmel Valley Pump Station would use Highway 1 and Carmel Valley Road to access the construction work area. There are no other facilities proposed in the Carmel Valley area that could contribute additional vehicle trips during project construction. As shown in **Table 4.9-4**, construction of this project component would require up to 12 workers. Construction workers would generate up to 14 round-trips (28 one-way trips) per day (24 commute trips and four midday trips). This project component would generate an estimated six truck round-trips (12 one-way trips) per day for materials and equipment deliveries and hauling of excess spoils and construction debris offsite. The increases in traffic resulting from construction of the Carmel Valley Pump Station would fall within the daily fluctuations of traffic volumes for Carmel Valley Road and this segment of Highway 1, and would not be noticeable to the average motorist. Therefore, this impact would be less than significant for the Carmel Valley Pump Station.

Impact Conclusion

Project-related construction activities would result in a temporary increase in traffic from construction workers and trucks traveling to and from the construction work areas. Although the estimated maximum increase in traffic along regional roadways would remain within the carrying capacities of the regional roadways and would not substantially affect traffic flow, construction-related traffic increases along local and neighborhood (residential) streets could result in adverse traffic conditions. For reasons described above, this impact would be less than significant for all project components located north of Reservation Road and for the Carmel Valley Pump Station. This impact would be potentially significant for the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, ASR-5 and ASR-6 Wells, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements. However, implementation of **Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan)** would reduce this potentially significant impact related to increased traffic to a less-than-significant level.

Consistency with Regulatory Requirements

In addition to the impact described above, as noted in **Table 4.9-2**, project construction could conflict with applicable land use policies and ordinances related to increased traffic congestion. These policies and ordinances include Seaside General Plan Policy C-1.7 and Monterey County

General Plan Policy C-3.4. Implementation of **Measure 4.9-1 (Traffic Control and Safety Assurance Plan)** would require that CalAm or its contractors develop project-specific circulation and detour plans to reduce traffic congestion to the extent feasible. Therefore, with this measure implemented, the MPWSP would be brought into conformance with the above-noted policies and ordinances.

Mitigation Measures

Mitigation Measure 4.9-1 has been developed for the project as a whole (to comply with road encroachment requirements for applicable jurisdictions) and applies to all project components and associated construction activities; however, with respect to construction-related increases in traffic and traffic congestion impacts, only the following project components would require implementation of this measure to reduce impacts to a less-than-significant level: the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, ASR-5 and ASR-6 Wells, Ryan Ranch–Bishop Interconnection Improvements, and Main System–Hidden Hills Interconnection Improvements.

Mitigation Measure 4.9-1: Traffic Control and Safety Assurance Plan.

CalAm and/or the construction contractor(s) shall obtain any necessary road encroachment permits (e.g., from Caltrans and/or the U.S. Army) prior to constructing each project component and shall comply with the conditions of approval attached to all project permits and approvals. As part of the road encroachment permit process, a qualified traffic engineer shall prepare a traffic control and safety assurance plan in accordance with professional engineering standards and submit the plan to the agencies with jurisdiction over the affected roads and recreational trails, as well as to the California Public Utilities Commission, for review and approval. For all project construction activities that could affect the public right-of-way (e.g., roadways, sidewalks, and walkways), the plan shall include measures that would provide for continuity of vehicular, pedestrian, and bicyclist traffic; reduce the potential for traffic accidents; and ensure worker safety in construction zones. Where project construction activities could disrupt mobility and access for bicyclists and pedestrians, the plan shall include measures to ensure safe and convenient access, including recreation and coastal, would be maintained.

The traffic control and safety assurance plan shall be developed on the basis of detailed design plans for the approved project. The plan shall include, but not necessarily be limited to, the elements listed below:

- Develop circulation and detour plans to minimize impacts on local streets. Haul routes that minimize truck traffic on local roadways and residential streets shall be used. As necessary, signage and/or flaggers shall be used to guide vehicles through the construction work areas.
- Control and monitor construction vehicle movements by enforcing standard construction specifications through periodic onsite inspections.
- Install traffic control devices where traffic conditions warrant, as specified in the applicable jurisdiction’s standards (e.g., the *California Manual of Uniform Traffic Controls for Construction and Maintenance Work Zones*).

- Schedule truck trips outside of peak morning and evening commute hours to minimize adverse impacts on traffic flow (i.e., if agencies with jurisdiction over the affected roads identify highly congested roadway segments during their review of the encroachment permit applications).
- Post detour signs along affected roadways to notify motorists of alternative routes.
- Perform construction that crosses on-street and off-street bikeways, sidewalks, and other walkways in a manner that allows for safe access for bicyclists and pedestrians. Alternatively, provide safe detours to reroute affected bicycle/pedestrian traffic.
- At least two weeks prior to construction, post signage along all potentially affected recreational trails and coastal access points; Class I, II, and II bicycle routes; and pedestrian pathways, including the Monterey Peninsula Recreational Trail, to warn bicyclists and pedestrians of construction activities. The signs shall include information regarding the nature of construction activities, duration, and detour routes. Signage shall be composed of or encased in weatherproof material and posted in conspicuous locations, including on park message boards, and existing wayfinding signage and kiosks, for the duration of the closure period. At the end of the closure period, CalAm or its contractors shall retrieve all notice materials.
- CalAm and its contractors shall schedule construction activities to minimize impacts during heavy recreational use periods (e.g., weekends and holidays).
- Implement a public information program to notify motorists, bicyclists, nearby residents, and adjacent businesses of the impending construction activities (e.g., media coverage, email notices, websites, etc.). Notices of the location(s) and timing of road closures shall be published in local newspapers and on available websites to allow motorists to select alternative routes. This provision shall be implemented in conjunction with **Mitigation Measure 4.12-1a (Neighborhood Notice)**.
- Consult with non-jurisdictional parties (e.g., CEMEX), as appropriate, regarding strategies for reducing increased traffic on roads that would provide access to construction work areas.
- Store all equipment and materials in designated contractor staging areas.
- Maintain alternate one-way traffic flow past the construction zone where possible.
- Install detour signs to direct traffic to alternative routes around the closed road segment if alternate one-way traffic flow cannot be maintained past the construction zone.
- Limit lane closures during peak hours.
- Restore roads and streets to normal operation by covering trenches with steel plates outside of normal work hours or when work is not in progress.
- Comply with roadside safety protocols to reduce the risk of accidents. Provide “Road Work Ahead” warning signs and speed control (including signs informing drivers of state-legislated double fines for speed infractions in a construction zone) to achieve required speed reductions for safe traffic flow through the work zone. Train construction personnel to apply appropriate safety measures as described in the traffic control and safety assurance plan.
- Maintain access for emergency vehicles at all times. Coordinate with facility owners or administrators of sensitive land uses such as police and fire stations, transit

stations, hospitals, and schools. Provide advance notification to local police, fire, and emergency service providers of the timing, location, and duration of construction activities that could affect the movement of emergency vehicles on area roadways.

- Develop a school traffic and pedestrian safety plan to minimize adverse impacts associated with truck trips and lane closures (e.g., in the vicinity of the Marshall Elementary School east of the General Jim Moore Boulevard / Normandy Road intersection).
- Avoid truck trips through designated school zones during the school drop-off and pickup hours to the extent feasible.
- Provide flaggers in school areas at street crossings to manage traffic flow and maintain traffic safety during the school drop-off and pickup hours on days when pipeline installation would occur in designated school zones.
- Coordinate with Monterey-Salinas Transit so the transit provider can temporarily relocate bus stops in work zones as deemed necessary.

Impact 4.9-2: Temporary reduction in roadway capacities and increased traffic delays during construction. (*Less than Significant with Mitigation*)

Whereas Impact 4.9-1 addresses increased vehicle traffic, this impact relates to construction activities occurring within vehicle travel lanes and road shoulders that could require temporary lane closures and/or detours. These lane closures and detours would temporarily reduce roadway capacities and result in increased traffic delays during project construction, which could cause temporary conflicts with local jurisdictions' measures of effectiveness for the performance of the circulation system.

All Proposed Pipelines

The proposed project would include installation of approximately 21 miles of new pipelines. **Table 4.9-1**, above, presents the roads that would be directly affected by project construction activities (i.e., construction would occur within or adjacent to, or across, the road rights-of-way).

Pipeline installation would generally be accomplished using conventional open-trench methods; however, where it is not feasible to perform open-cut trenching—such as state highway crossings, stream and drainage crossings, and areas of high utility congestion—trenchless technologies (e.g., jack-and-bore or horizontal directional drilling) would be used. At a minimum, trenchless methods of pipeline installation would be necessary at seven locations:

1. Installation of the Source Water Pipeline beneath the TAMC right-of-way at Lapis Road, just north of the CEMEX access Road;
2. Installation of the new Desalinated Water Pipeline beneath the TAMC right-of-way near the southern intersection of Lapis Road/Del Monte Boulevard;
3. Installation of the new Transmission Main beneath the TAMC right-of-way near Marine Drive/Del Monte Boulevard/Reindollar Avenue;

4. Installation of the new Transmission Main Optional Alignment at Highway 1 and Lightfighter Drive;
5. Installation of the Castroville Pipeline under the Salinas River; and
6. Installation of the Castroville Pipeline under Trembladero Slough.

Trenchless technologies would not reduce the number or available width of travel lanes because pits used for bore-and-jack and directional drilling would be located out of public roadways. The use of trenchless construction methods beneath Highway 1 and Highway 68 would avoid traffic flow disruptions. Each roadway crossing presents unique conditions, and construction methods at other roadway crossings would vary depending on such factors as the available construction area, possible utility interference, and the contractor's preferred method of construction.

The average open-trench width and depth for pipeline installation would be 6 feet and 8 feet, respectively. Pipeline installation would progress at a rate of approximately 150 to 250 feet per day. The active work area along open trenches would be wider than the trenches themselves to accommodate access by trucks and loaders. Staging areas are proposed at strategic locations throughout the project area (see Table 3-4 in Chapter 3, Project Description).

Depending on the final pipeline alignments, where construction would occur in vehicle travel lanes or the adjacent road shoulder, and the width of roads, temporary lane closures and/or detours could be needed to accommodate the construction zone. Some roadway segments would have sufficient pavement width outside of the construction zone to accommodate two-way traffic flow, but other roadways would not, and alternate one-way traffic flow would be maintained on pavement as narrow as 10 feet.

Where feasible and appropriate, construction contractors would install pipelines so as to avoid construction within vehicle travel lanes and to minimize impacts on roadway capacity and function. Detailed information regarding the final pipeline alignments (i.e., whether the pipelines would require construction in road rights-of-way) and associated construction activities would be developed during final project design. This analysis conservatively assumes that all pipelines could require construction within or adjacent to vehicle travel lanes and could require temporary lane closures and/or detours. Impacts on roadway capacities and traffic flow related to pipeline installation are considered to be potentially significant for all proposed pipelines. However, with implementation of **Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan)**, which includes measures to minimize the adverse effects of roadway construction and detours, these impacts would be reduced to a less-than-significant level.

All Other Proposed Facilities

Installation of non-linear facilities (e.g., subsurface slant wells, MPWSP Desalination Plant, Brine Mixing Box, ASR-5 and ASR-6 Wells, and Carmel Valley Pump Station) would not involve construction within road rights-of-way and would not result in temporary lane closures or detours. Therefore, the impact would be less than significant.

Impact Conclusion

Traffic delays resulting from temporary lane closures and detours would be a potentially significant impact for all of the proposed pipelines, but implementation of **Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan)** would reduce the impact to a less-than-significant level. For all other proposed facilities, the impact would be less than significant because none of the non-linear facilities would require temporary lane closures or detours.

Mitigation Measures

Mitigation Measure 4.9-1 has been developed for the project as a whole (to comply with road encroachment requirements for applicable jurisdictions) and applies to all project components and associated construction activities; however, with respect to reduced road capacity resulting from temporary lane closures and detours during project construction, only construction of the proposed pipelines would require implementation of this measure to reduce impacts to a less-than-significant level.

Mitigation Measure 4.9-1: Traffic Control and Safety Assurance Plan.

(See Impact 4.9-1, above, for description.)

Impact 4.9-3: Increased traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways, and area trails, sidewalks and other pathways, during construction. (*Less than Significant with Mitigation*)

All Proposed Project Facilities

Construction vehicles traveling to and from the project area, including trucks delivering equipment and supplies to the construction work areas and trucks hauling excavated materials offsite for disposal, would share the area roadways with other vehicles. Also, pipeline construction would take place within or adjacent to the road for a length of approximately 21 miles. The greatest number of daily construction-related truck trips would occur along Highway 1 and Del Monte Boulevard. During project construction, bicyclists and pedestrians could be required to enter the adjacent road shoulder or use other temporary detours to circumvent construction work areas.

Project construction activities could increase traffic safety hazards in the project area due to:

- Conflicts between haul trucks and other large construction vehicles (with slower speeds and wider turning radii than automobiles) and automobiles, bicyclists, and pedestrians using the roadways;
- Conflicts related to the movement of traffic on travel lanes adjacent to construction work areas, particularly at entry and egress points where construction-related vehicles would access public roadways; and
- Confusion on the part of bicyclists and pedestrians due to temporary changes in bicycle and pedestrian circulation along the Monterey Peninsula Recreational Trail, designated bicycle routes, and sidewalks and other public pathways.

Potential increases in traffic safety hazards during project construction would be a potentially significant impact. However, implementation of **Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan)** would reduce this potential impact to a less-than-significant level.

Mitigation Measures

Mitigation Measure 4.9-1 applies to all proposed project facilities and associated construction activities.

Mitigation Measure 4.9-1: Traffic Control and Safety Assurance Plan.

(See Impact 4.9-1, above, for description.)

Impact 4.9-4: Impaired emergency access during construction. (*Less than Significant with Mitigation*)

All Proposed Pipelines

As discussed above for Impact 4.9-2, pipeline installation activities (including the Brine Mixing Box) could require construction within vehicle travel lanes and road shoulders. Temporary reductions in travel lanes and roadway capacity to accommodate the construction work areas could result in delays for emergency vehicles. Trenching and paving along roadways during pipeline installation could also disrupt emergency vehicle access to adjacent land uses. This impact is potentially significant. However, implementation of **Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan)**, which contains provisions to maintain access during construction, would reduce the impact to a less-than-significant level.

All Other Proposed Facilities

Construction activities and staging areas for the subsurface slant wells, MPWSP Desalination Plant, ASR-5 and ASR-6 Wells, and Carmel Valley Pump Station are not expected to require construction in roadways or road shoulders. As such, construction of these facilities would not obstruct access for emergency vehicles in the vicinity of the construction work areas. Therefore, impacts related to disrupted access to adjacent land uses for emergency vehicles would be less than significant.

Mitigation Measures

Mitigation Measure 4.9-1 has been developed for the project as a whole (to comply with road encroachment requirements for applicable jurisdictions). However, with respect to disruptions to emergency access, only construction of the proposed pipelines would require implementation of this measure to reduce impacts to a less-than-significant level.

Mitigation Measure 4.9-1: Traffic Control and Safety Assurance Plan.

(See Impact 4.9-1, above, for description.)

Impact 4.9-5: Temporary disruptions to public transportation, bicycle, and pedestrian facilities during construction. (*Less than Significant with Mitigation*)

Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond

Construction activities for the Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond would occur on or adjacent to private roads and would not impede vehicular, bicycle, or pedestrian traffic flow or disrupt public transportation. As such, there would be no impacts on public transportation and bicycle and pedestrian facilities from construction of these facilities.

All Other Proposed Pipelines

Pipeline installation activities could temporarily affect public transportation, bicycle travel, and pedestrian travel along affected roadways and recreational trails in the project area. About 21 miles of pipelines would be installed, with 6 of those miles located within or adjacent to the Monterey Peninsula Recreational Trail.

Construction activities, including vehicle ingress and egress, equipment and materials staging, trenching, and stockpiling, could disrupt established bicycle and pedestrian facilities located along the pipeline alignments. The proposed Source Water Pipeline alignment crosses the Monterey Peninsula Recreational Trail at the intersection of Del Monte Boulevard and Charles Benson Road. The new Desalinated Water Pipeline would be installed on the west side of Del Monte Boulevard, alongside the Monterey Peninsula Recreational Trail and the TAMC right-of-way between Charles Benson Road and Reservation Road. Roughly 3 miles of the new Transmission Main would be constructed along the TAMC right-of-way and the Monterey Peninsula Recreational Trail. This segment of the new Transmission Main would also border the eastern boundary of Fort Ord Dunes State Park. The Monterey Peninsula Recreational Trail serves as a primary bicycle and pedestrian access route into the Fort Ord Dunes State Park from Marina, Sand City, and Seaside. The Ryan Ranch-Bishop Interconnection Improvements would be installed along Ragsdale Drive, Lower Ragsdale Drive, and Wilson Road, all of which have designated Class II bikeways.

Construction activities within or adjacent to vehicle travel lanes could disrupt access to bus stops operated by MST, require that bus stops be temporarily relocated, and/or conflict with bicycle traffic along roads with designated bike lanes. Pipeline installation activities along the Monterey Peninsula Recreational Trail could conflict with bicycle and pedestrian traffic. Construction-related impacts on alternative transportation modes and facilities during pipeline installation activities would be potentially significant. However, implementation of **Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan)**, which includes measures that would minimize impacts on public transportation and provide for continuity of pedestrian and bicyclist traffic during construction, would reduce the impact to a less-than-significant level.

All Other Proposed Facilities

Construction activities for the subsurface slant wells, MPWSP Desalination Plant, ASR injection/extraction wells, and Carmel Valley Pump Station would occur in off-road areas and would not impede vehicular, bicycle, or pedestrian traffic flow or disrupt public transportation.

As such, there would be no impacts on public transportation and bicycle and pedestrian facilities from construction of these facilities.

Consistency with Regulatory Requirements

In addition to the impact described above, as noted in **Table 4.9-2**, project construction could conflict with applicable land use plans, policies, and/or ordinances related to alternative modes of transportation (e.g., public transit, bicycle, pedestrian). These include City of Monterey Del Monte Beach Land Use Plan Policy 13 and Monterey Harbor Land Use Plan Policy 3.K. Implementation of **Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan)** includes several provisions for addressing the potential adverse effects on these resources and facilities during project construction. With this measure implemented, the MPWSP would be consistent with the above-noted policy and ordinances.

Mitigation Measures

Mitigation Measure 4.9-1 has been developed for the project as a whole (to comply with road encroachment requirements for applicable jurisdictions). However, with respect to disruptions to public transportation and bicycle/pedestrian facilities, only construction of the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, and Castroville Pipeline would require implementation of this measure to reduce impacts to a less-than-significant level.

Mitigation Measure 4.9-1: Traffic Control and Safety Assurance Plan.

(See Impact 4.9-1, above, for description.)

Impact 4.9-6: Increased wear-and-tear on the designated haul routes used by construction vehicles. ***(Less than Significant with Mitigation)***

All Project Components

The use of trucks to transport equipment and material to and from the construction work areas could affect road conditions on the designated haul routes by increasing the rate of road wear. The degree to which this impact would occur depends on the roadway design (pavement type and thickness) and the existing condition of the road. Freeways and major arterials (e.g., Highways 1, 68, 101, 156, 183, and 218, Del Monte Boulevard, and Fremont Boulevard / Fremont Street) are designed to handle a mix of vehicle types, including heavy trucks; therefore, the impacts of project-related construction traffic are expected to be negligible on those roads. However, some of the smaller roadways and residential streets may not have been constructed to support use by heavy construction trucks and vehicles, and project-related increases in construction truck trips could cause excessive wear-and-tear on these roadways, a potentially significant impact. However, implementation of **Mitigation Measure 4.9-6 (Roadway Rehabilitation Program)**, which requires rehabilitation of any roadways damaged following construction, would reduce this impact to a less-than-significant level.

Mitigation Measures

Mitigation Measure 4.9-6 applies to all proposed facilities and associated construction activities.

Mitigation Measure 4.9-6: Roadway Rehabilitation Program.

Prior to commencing project construction, CalAm and the affected jurisdiction(s) shall enter into an agreement detailing the preconstruction condition of all major project-related construction access and haul routes, in addition to any appropriate post-construction roadway rehabilitation requirements (e.g., who would make the roadway repair, and by when). Temporary detour routes may also be included in the inventory of preconstruction road conditions, if appropriate. The construction routes identified in the rehabilitation program must be consistent with those identified in the construction traffic control and safety assurance plan developed under Mitigation Measure 4.9-1. Roads damaged by project-related construction vehicles shall be repaired to a structural condition equal to that which existed prior to construction activities. CalAm shall be responsible for paying for all repairs needed to fix the damage caused by project-related construction vehicles.

Impact 4.9-7: Parking interference during construction. (*Less than Significant with Mitigation*)

Assuming construction workers would drive to construction work areas alone in their own vehicles (i.e., they would not carpool), project-related construction activities would increase parking demand at certain locations in the project area. Worker parking demand would vary among the individual project components and would also depend on the construction phase and the nature of construction activities taking place. In addition, depending on the final pipeline alignments and the width of the vehicle travel lanes or adjacent road shoulders where construction would occur, construction activities could displace parking spots and adversely affect parking conditions. **Table 4.9-1** shows roadways that could be directly affected by project construction activities and indicates whether these roads have on-street parking spaces. Where feasible and appropriate, construction contractors would install pipelines so as to avoid construction within vehicle travel lanes and minimize parking displacement. Detailed information regarding pipeline alignments (i.e., whether the pipelines would require construction in road rights-of-way) and associated construction activities would be developed during project design. This analysis assumes that pipeline installation activities could require construction within or adjacent to vehicle travel lanes and could require temporary displacement of parking spaces.

All Proposed Pipelines

Installation of the proposed pipelines in unincorporated Monterey County and in the cities of Marina and Seaside, could temporarily displace parking spaces along the affected roadways that have on-street parking. However, field observations show that, in general, the roadways along these other pipeline alignments have less-than-substantial demand for the available on-street parking spaces, and/or alternative parking spaces are present nearby. Therefore, impacts associated with temporary displacement of on-street parking during installation of these other pipelines would be less than significant, and no mitigation is necessary.

Subsurface Slant Wells

Construction of subsurface slant wells and support facilities would occur entirely within the CEMEX sand mining facility and would have no effect on parking availability in public areas. Further, construction worker parking demand for the subsurface slant wells could be accommodated within the construction work areas and in other previously disturbed areas of the CEMEX sand mining facility. Thus, no impact would result.

MPWSP Desalination Plant

Construction worker parking demand for the MPWSP Desalination Plant could easily be accommodated within the 46-acre parcel, which is currently vacant. Construction activities at the MPWSP Desalination Plant site would have no effect on parking availability in public areas. Thus, no impact would result.

ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline and ASR Recirculation Pipeline

Construction of the ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline could increase parking demand in the vicinity of General Jim Moore Boulevard in the former Fort Ord area. However, field observations show that there is ample on-street parking available in the former Fort Ord area to accommodate this increase. Thus, this impact would be less than significant.

Carmel Valley Pump Station, Main System-Hidden Hills Interconnection Improvements, and Ryan Ranch-Bishop Interconnection Improvements

The Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements are located in low-density areas with ample parking available to accommodate construction worker vehicles. Any on-street parking displaced during installation of proposed improvements in roadways could also be accommodated on adjacent roadways. This impact would be less than significant.

Staging Areas

Many of the proposed staging areas (see Table 3-4 in Chapter 3, Project Description) would occupy portions of parking lots (e.g., a lot that serves Cal State Monterey, and a Walmart parking lot). The temporary displacement of parking spaces would be potentially significant. However, implementation of **Mitigation Measure 4.9-7 (Construction Parking Requirements)** would reduce this impact to a less-than-significant level. **Mitigation Measure 4.9-7** requires that the construction contractor coordinate with the affected jurisdictions (i.e., Cal State Monterey, and the cities of Marina and Seaside) to design the staging areas to avoid or minimize parking impacts in the publicly used parking lots.

Impact Conclusion

Provision of staging areas in publicly used parking lots would result in potentially significant parking impacts due to temporary increases in parking demand associated with construction worker vehicles and/or temporary displacement of parking spaces in publicly used parking lots for staging areas (off-street). However, implementation of **Mitigation Measure 4.9-7 (Construction Parking Requirements)** would reduce this impact to a less-than-significant level. Construction activities for the subsurface slant wells and MPWSP Desalination Plant would have no effect on parking. Parking displacement impacts resulting from construction of the proposed ASR-5 and ASR-6 Wells, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and all other proposed pipelines would be less than significant.

Mitigation Measures

Mitigation Measure 4.9-7 applies only to staging areas in publicly used parking lots.

> **Mitigation Measure 4.9-7: Construction Parking Requirements.**
>
> Prior to commencing project construction, the construction contractor(s) shall coordinate with the affected jurisdictions (i.e., Monterey County, Cal State Monterey, and the cities of Marina and Seaside), and affected parties (i.e., the Walmart Superstore at 150 Beach Road), to design the staging areas to avoid or minimize parking impacts in the publicly used parking lots.

4.9.5.2 Operational and Facility Siting Impacts

Impact 4.9-8: Long-term traffic increases on regional and local roadways during project operations and maintenance. (*Less than Significant*)

Operation- and maintenance-related vehicle traffic could result in increased congestion and delays for vehicles, which could cause conflicts with local jurisdictions' measures of effectiveness for the performance of the circulation system.

MPWSP Desalination Plant

The MPWSP Desalination Plant would be operated 24 hours per day, 365 days per year, and is estimated to require approximately 25 to 30 full-time workers (facility operators and support personnel) to operate, monitor, and maintain the desalination facilities. There would be up to 10 workers for each of the following three shifts: 9:00 a.m. to 5:00 p.m., 4:00 p.m. to 1:00 a.m., and 12:00 a.m. to 9:00 a.m., and based on that assumption, approximately 66 one-way trips (33 round trips) would occur throughout each day (30 commute trips and 3 midday trips) during long-term operations and maintenance of the MPWSP Desalination Plant.

The greatest long-term increase in vehicle trips from MPWSP Desalination Plant operations would occur on Charles Benson Road, and based on existing traffic conditions and the industrial nature of the surrounding land uses on Charles Benson Road, the projected increase is well within the roadway carrying capacity of this two-lane road and would not adversely affect traffic conditions. Given that the minimal number of daily vehicle trips associated with worker commutes and deliveries would be dispersed onto different roads farther removed from Charles Benson Road, long-term operations and maintenance of the MPWSP Desalination Plant would not adversely affect traffic conditions on the overall existing circulation system over the long term. Therefore, the impact would be less than significant.

All Other Proposed Facilities

All other proposed facilities (i.e., the subsurface slant wells, Brine Mixing Box, ASR-5 and ASR-6 Wells, Carmel Valley Pump Station, and all pipelines) would be operated remotely using Supervisory Control and Data Acquisition systems, with periodic visits by CalAm personnel for operations review and maintenance. Maintenance activities include such tasks as landscape maintenance, visual inspections of facilities, performance monitoring, servicing of pumps, testing and servicing of valves, backflushing the ASR-5 and ASR-6 Wells, and minor pipeline repairs. The vehicle trips generated by these routine and periodic site visits would be similar in number to those required for existing CalAm operations in the Monterey District service area and would not constitute a significant increase in new vehicle trips on area roadways. Overall, any increases in traffic generated by facility operations and maintenance would be negligible compared to existing conditions and would not result in a noticeable increase in traffic on adjacent streets. Therefore, the long-term traffic impact for all other proposed facilities would be less than significant.

Impact Conclusion

The impact related to long-term increases in vehicle trips during project operations and maintenance is less than significant for all project facilities.

Mitigation Measures

None proposed.

4.9.6 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects.

Impact 4.9-C: Cumulative impacts related to traffic and transportation. (Significant and Unavoidable, even with implementation of feasible mitigation)

The MPWSP would result in no impact with respect to conflicts with an applicable congestion management plan, changes in air traffic patterns, permanent increases in traffic safety hazards due to a design feature or incompatible uses, or conflicts with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities. Therefore, it could not cause or contribute to any cumulative effects related to these traffic and transportation topics, and these topics are not discussed further.

The geographic scope for the cumulative traffic impact analysis encompasses the local and regional roadways and highways that would be used for project-related construction and operational activities and for access by construction worker and operational employee vehicles. A significant cumulative effect on transportation and traffic could occur if the incremental impacts of the MPWSP combined with those of one or more of the projects listed in **Table 4.1-2** that would use the same transportation network as the MPWSP during the life of the project to substantially and adversely affect the effectiveness of the circulation system or to result in inadequate emergency access.

Cumulative Impacts during Project Construction

As discussed above in Sections 4.9.4 and 4.9.5, the MPWSP's significant impact related to increased congestion from construction traffic would be reduced with the implementation of **Mitigation Measures 4.9-1 (Traffic Control and Safety Assurance Plan)**, **4.9-6 (Roadway Rehabilitation Program)**, and **4.9-7 (Construction Worker Parking Requirements)**. However, the residual impacts after implementation of these mitigation measures are discussed below. Due to increased traffic and transportation network disruptions, concurrent construction of the MPWSP and the projects listed in **Table 4.1-2** would result in potentially significant cumulative impacts on traffic and transportation access and facilities. Such impacts would include a short-term increase in vehicle traffic, reductions in the number or the available width of travel lanes on roads where construction would occur, increased wear-and-tear on the designated haul routes used by construction vehicles, and increases in demand for parking spaces to accommodate construction worker vehicles, among others. In addition, concurrent construction of these projects could create traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways. Access to adjacent land uses and streets for both general traffic and emergency vehicles could be disrupted. The MPWSP's contributions to these impacts would occur along routes adjacent to most pipeline alignments and above-ground project components south of Reservation Road.

Although the construction schedule for many of the projects listed in **Table 4.1-2** is unknown, the construction schedule for several future cumulative projects could overlap with the anticipated MPWSP construction schedule, thereby causing the types of regional and local traffic and transportation impacts described above. These projects include projects in Monterey County (Nos. 1, 2, 4, and 54), Marina (Nos. 7, 9, 47, and 63), Seaside (Nos. 14 and 17), Beach Junction Structure (No. 61), and Pacific Grove (No. 45). The other projects identified in **Table 4.1-2** are in various stages of planning or entitlement processes and also could occur during the MPWSP's anticipated construction timeframe of summer 2018 through summer 2020.

Potentially significant cumulative traffic and transportation access and facility impacts of the types described above could occur along regional transportation corridors, including Highways 1, 68, and 218, in the vicinity of proposed MPWSP components. Such impacts also would be expected along local arterial and neighborhood roadways connecting regional thoroughfares with specific project construction sites. Based upon the anticipated MPWSP and cumulative project construction schedules (**Table 4.1-2**), potentially significant cumulative impacts on local roadways would likely be concentrated in the cities of Marina, Seaside, and Sand City. However, as discussed, several other projects whose construction timelines remain unknown also could be constructed within the anticipated MPWSP construction window and have similar transportation effects. Accordingly, this analysis conservatively assumes that at least some of the cumulative projects whose construction schedules remain unknown would be constructed concurrent with the MPWSP. Therefore, the possibility for potential significant cumulative impacts in the cities of Monterey and Pacific Grove as well as in Monterey County cannot be ruled out. The Monterey Pipeline and Pump Station project (No. 60), recently approved and currently under construction, will adversely affect traffic in Seaside and Pacific Grove, but is expected to be completed prior to the start of MPWSP construction.

As discussed above in Sections 4.9.4 and 4.9.5, CalAm would be required to implement **Mitigation Measures 4.9-1 (Traffic Control and Safety Assurance Plan), 4.9-6 (Roadway Rehabilitation Program), and 4.9-7 (Construction Parking Requirements)**, each of which would lessen the MPWSP's contribution to cumulative construction-related traffic and transportation impacts. Specifically, these measures would reduce MPWSP's incremental contribution to congestion and traffic delays on area roadways, safety hazards, emergency access, alternative transportation facilities, wear and tear, and parking impacts. However, given the size of the MPWSP, along with the number of cumulative projects and uncertainty regarding cumulative project construction timing, the residual MPWSP transportation impacts could still contribute substantially to cumulative local and regional traffic and roadway capacity disruptions, a cumulatively significant impact.

Mitigation Measure 4.9-C, presented below, is designed to further reduce the MPWSP's incremental contribution to address the potential cumulative impact. However, there is no guarantee that local agencies would participate in such coordination efforts. Therefore, even though this mitigation measure could reduce MPWSP's cumulative contribution to a less-than-significant level, the conclusion remains that the proposed project's incremental contribution to potential significant cumulative effects would be significant and unavoidable.

Mitigation Measure 4.9-C: Construction Traffic Coordination Plan.

CalAm shall coordinate with the appropriate planning agency within each affected jurisdiction to develop and implement a Construction Traffic Coordination Plan. The purpose of the plan shall be to lessen the cumulative effects of MPWSP and local development project construction-related traffic delays and congestion. The plan shall address construction-related traffic associated with all project sites in the vicinity of MPWSP project components (i.e., within 1 mile or would use the same roads) and whose construction schedules overlap that of the MPWSP. The construction traffic coordination plan shall, at a minimum, include the following components:

- Identification of all projects located in the vicinity of MPWSP project components (within 1 mile or would use the same roads) and whose construction schedules overlap that of the MPWSP.
- Consideration for the types of construction-related vehicles and corresponding numbers and timing of trips associated with each said project.
- An evaluation of roadways affected by construction activities and measures to minimize roadway and traffic disturbances (e.g., lane closures and detours). Impact

minimization measures shall include, but not necessarily be limited to, elements that are part of the MPWSP's Traffic Control and Safety Assurance Plan (Mitigation Measure 4.9-1).

- Phasing of construction activities, as necessary to prevent degradation of levels of service on affected roadways.
- A program that provides for continual coordination with the affected agencies to allow for adjustments and refinements to the plan once construction is underway.

The construction traffic plan may be modeled after or included within the plan described in **Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan)**. If necessary, separate construction traffic coordination plans (i.e., one for each affected jurisdiction) may be prepared, provided each is compatible.

Cumulative Impacts during Project Operations

A significant cumulative impact associated with long-term traffic increases would occur if the traffic or transportation-related effects of MPWSP operations, combined with those of one or more cumulative projects identified in **Table 4.1-2**, were to cause traffic on local and regional roadways to exceed established level of service standards. The number of new vehicle trips that would occur in association with operation of the projects in **Table 4.1-2** remains unknown. Given the large number and nature of these projects, the cumulative operations-related traffic is expected to be substantial.

As described in Section 4.9.5, above, the MPWSP would have less-than-significant long-term traffic increases on regional and local roadways during project operations and maintenance. As discussed under Impact 4.9-8, the MPWSP would require approximately 25 to 30 full-time workers (project facility operators and support personnel) to operate, monitor, and maintain the desalination facilities (all other facilities would be operated remotely by computer and require infrequent maintenance visits). MPWSP Desalination Plant workers would add up to an estimated 66 daily one-way trips to the local and regional road network. The anticipated increase in traffic associated with these vehicle trips would not be noticeable to other motorists and would not affect the users of alternative travel modes (e.g., pedestrians and bicyclists).

The combined effects of operations-related traffic from the projects identified in Table 4.1-2 could have a potentially significant cumulative impact on local and regional traffic. However, the addition of traffic associated with MPWSP operation and maintenance would not contribute substantially to those impacts; they would be mostly limited to Charles Benson Road and Highway 1. The only cumulative projects identified on Table 4.1-2 expected to affect Charles Benson Road are the RUWAP elements (Nos. 31 and 35), whose operational traffic would be between zero and four one-way trips daily (Denise Duffy & Associates, 2004). As a result, the MPWSP's incremental contribution to cumulative operations-related traffic impacts would be less than significant.

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4.10 Air Quality

This section evaluates the potential impacts on regional and local air quality that would result from construction and operation of the Monterey Peninsula Water Supply Project (MPWSP or proposed project). The analysis is based on estimates of project-related air pollutant emissions, review of existing air quality conditions in the region, and applicable air quality regulations and guidelines. Impacts specific to greenhouse gas (GHG) emissions and climate change are evaluated in Section 4.11, Greenhouse Gas Emissions.

Comments received on the April 2015 Draft EIR expressed concerns regarding the potential for the project to release naturally occurring asbestos during construction; however, there are no areas in the project area that are likely to contain naturally occurring asbestos (CDC, 2000); therefore, this issue is not addressed further in this EIR/EIS. Some commenters suggested that indirect emissions of criteria pollutants associated with electricity use should be quantified and evaluated. This issue is addressed in Section 4.10.5.2, under Impact 4.10-4. Some comments suggested that the operational emissions associated with the periodic excavation and mechanical cleaning of the subsurface slant wells should be quantified. Subsequent to the release of the April 2015 Draft EIR, the layout of project facilities at the CEMEX active mining area was modified such that the well heads, valves, and other slant well facilities are now aboveground and readily accessible for maintenance, thereby reducing the disturbance area associated with periodic maintenance. See Impact 4.10-4 for quantification of emissions associated with slant well maintenance. Comments pertaining to regulatory guidance on health risk assessments are addressed in Impact 4.10-3. Comments associated with construction-related $PM_{2.5}$, NO_2, *and ROG emissions are addressed in Impact 4.10-3.*

As a result of comments received on the January 2017 Draft EIR/EIS, revisions have been made to this EIR/EIS section. The most substantive changes include:

- *The addition of the Asbestos Program to Section 4.10.2.2, Regional Agencies and Regulations;*
- *Revisions to Mitigation Measures 4.10-1a and 1b to include requirements for Tier 4 emissions standards and alternative power provisions, and more stringent idling requirements, respectively; and,*

- *Addition of Mitigation Measure 4.10-1e, which requires implementation of an off-site mitigation program to offset construction-related NOx emissions.*

4.10.1 Setting/Affected Environment

The study area for impacts on air quality is the North Central Coast Air Basin (Air Basin). Air quality is a function of both the amount and location of pollutant emissions under the influence of meteorological conditions and topographic features that affect pollutant movement and dispersal. Atmospheric conditions such as wind speed, wind direction, atmospheric stability, the presence of sunlight, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants, all of which affects air quality.

4.10.1.1 Regional Topography, Meteorology, and Climate

Topography and meteorology greatly influence air quality. Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and/or dispersion of air pollutants. Marine breezes from Monterey Bay dominate the climate of this portion of the Air Basin; westerly winds predominate in all seasons, but are strongest and most persistent during the spring and summer.

The Air Basin covers 5,159 square miles along the central coast of California and is generally bounded by the Monterey Bay to the west, the Santa Cruz Mountains to the northwest, the Diablo Range on the northeast, with the Santa Clara Valley between them. The southern part of the Santa Clara Valley extends into the northeastern tip of the Air Basin and transitions into the San Benito Valley, which runs northwest-southeast and is bounded on the west by the Gabilan Range. To the west of the Gabilan Range is the Salinas Valley, which extends from the city of Salinas at the northwest end to King City at the southeast end. The western edge of the Salinas Valley is formed by the Sierra de Salinas, which is also the eastern edge of the Carmel Valley. The Santa Lucia Range along the Pacific coast defines the western edge of the Carmel Valley.

The mountain ridges in the Air Basin restrict and channel summer onshore air currents. Hot temperatures in the inland valleys warm the ground and intensify onshore airflow during the afternoon and evening. In the fall, the surface winds weaken and the marine layer becomes shallow and eventually dissipates. The airflow is occasionally reversed, creating weak offshore winds.

A semi-permanent high-pressure cell in the eastern Pacific Ocean is the basic controlling factor in the climate of the Air Basin. In the summer, the high-pressure cell is dominant and causes persistent west and northwest winds over the entire California coast. Air descends in the Pacific high-pressure cell (Pacific High), forming a stable temperature inversion of hot air over a cool coastal layer of air. The onshore air currents pass over cool ocean waters to bring fog and relatively cool air into the coastal valleys. The warmer air aloft can inhibit vertical air movement.

The stationary air mass held in place by the Pacific High pressure cell can allow pollutants to build up over a period of days. These conditions also occur when north or east winds cause pollutant transport from the San Francisco Bay Area or the Central Valley into the Air Basin. In the winter, the Pacific High moves south and has a lesser influence on the Air Basin; wind flows southeasterly from the Salinas and San Benito Valleys, especially during the night and morning. Northwest winds are still dominant in winter, but easterly winds are more frequent in the winter than the summer. Air quality usually remains good in the winter and early spring due to the absence of deep, persistent regional subsidence inversions and the presence of occasional storms. Typically, year-round marine airflow allows coastal areas to maintain good air quality.

The project area typically has average maximum and minimum winter (i.e., January) temperatures of 60 degrees Fahrenheit (ºF) and 43 ºF, respectively, while average summer (i.e., July) maximum and minimum temperatures are 68 ºF and 52 ºF, respectively. The warmest month is typically September, with an average maximum high of 72 ºF. Because of the moderating marine influence, which decreases with distance from the ocean, monthly and annual temperature variations are greatest inland and smallest at the coast. The project area is mostly along the coast with temperature variations that are relatively moderate. Precipitation in the project area averages approximately 20 inches per year (WRCC, 2016).

The presence and intensity of sunlight is another important factor that affects air pollution. Typically, ozone is formed at higher temperatures. In the presence of ultraviolet sunlight and warm temperatures, reactive organic gases (ROGs) and nitrogen oxides (NO_x) react to form secondary photochemical pollutants, including ozone. Since temperatures in many of the Air Basin inland valleys are so much higher than near the coast, these inland areas are much more prone to photochemical air pollution.

4.10.1.2 Criteria Pollutants

The U.S. Environmental Protection Agency (USEPA) has identified criteria air pollutants that are a threat to public health and welfare. These pollutants are called “criteria” air pollutants because standards have been established for each of them to meet specific public health and welfare criteria (see Section 4.10.2, Regulatory Setting, below). Below are descriptions of criteria pollutants that are a concern in the study area.

Ozone

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving ROG and NO_x. ROG and NO_x are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours.

Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NO_x under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone.

Carbon Monoxide

Carbon monoxide (CO) is a non-reactive pollutant that is a product of incomplete combustion and is mostly associated with motor vehicle traffic. High CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

Particulate Matter

Respirable particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$) represent fractions of particulate matter that can be inhaled into air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain absorbed gases (e.g., chlorides or ammonium) that can pose a health risk. Particulates can also damage materials and reduce visibility.

Other Criteria Pollutants

Sulfur dioxide (SO_2) is produced through combustion of sulfur or sulfur-containing fuels such as coal. SO_2 is also a precursor to the formation of atmospheric sulfate and particulate matter (both PM_{10} and $PM_{2.5}$) and can contribute to sulfuric acid formation in the atmosphere that could precipitate downwind as acid rain. Lead has a range of adverse neurotoxin health effects, and was formerly released into the atmosphere primarily via leaded gasoline. The phase-out of leaded gasoline in California resulted in decreasing levels of atmospheric lead.

4.10.1.3 Toxic Air Contaminants

Toxic Air Contaminants (TACs) are airborne substances that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer-causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. The current California list of TACs includes approximately 200 compounds, including Diesel Particulate Matter (DPM) emissions from diesel-fueled engines (CARB, 2011).

4.10.1.4 Valley Fever

Valley Fever is an infectious disease caused by the fungus *Coccidioides immitis*. Valley Fever is also known as San Joaquin Valley Fever, Desert Fever, or Cocci. Infection is caused by inhalation of *Coccidioides immitis* spores that have become airborne when dry, dusty soil or dirt is disturbed by natural processes such as wind or earthquakes, or by human induced ground disturbing activities such as construction, farming, etc. There are about 100,000 new cases of Valley Fever per year in the southwestern United States. Cases of Valley Fever in Monterey County between 2011 through 2013 ranged between 68 and 75 cases per year, which equaled rates of 16.2 to 17.8 cases per populations of 100,000. In 2014 and 2015, cases of Valley Fever dropped substantially to 20 and 34 cases, respectively, which were equal to rates of 4.7 and 7.9 per population of 100,000, respectively (CDPH, 2016); however, the unofficial number of Valley Fever cases in 2016 rose back to pre-2014 levels with 78 cases (MCHD, 2017).

4.10.1.5 Existing Air Quality

Monterey Bay Unified Air Pollution Control District (MBUAPCD) operates a regional monitoring network that measures the ambient air quality in the Air Basin. Existing levels of air pollutants in the project area can generally be inferred from ambient air quality measurements conducted by MBUAPCD at its closest stations. The closest station is the Salinas #3 Monitoring Station located approximately 7 miles to the east of the MPWSP Desalination Plant site. The Salinas #3 Monitoring Station measures concentrations of ozone, $PM_{2.5}$, CO, and nitrogen dioxide (NO_2). The only monitoring station in the Air Basin that measures concentrations of PM_{10} is the Hollister-Fairview Road Monitoring Station, which is located approximately 24 miles to the east-northeast of the MPWSP Desalination Plant site. In addition, PM_{10} monitoring at the Hollister-Fairview Road Monitoring Station uses only federal reference or equivalent methods, so the data can only be compared to the federal standard.

Ambient concentrations of air pollutants in a given area are determined by the quantity of pollutants emitted by local sources in the area and the atmosphere’s ability to transport and dilute such emissions. Areas located close together and exposed to similar wind conditions typically have similar background pollutant concentrations. **Table 4.10-1** shows a five-year (2011–2015) summary of monitoring data for $PM_{2.5}$, CO, and NO_2 collected at the Salinas #3 Monitoring Station, and PM_{10} collected at the Hollister-Fairview Road Monitoring Station. The data are compared with the applicable California Ambient Air Quality Standards (state standards) and National Ambient Air Quality Standards (federal standards). As indicated in the table, there were no recorded violations of the state or federal standards from 2011 through 2015.

4.10.1.6 Sensitive Receptors

For the purposes of air quality and public health, sensitive receptors are generally defined as land uses with population concentrations that would be particularly susceptible to disturbance from air pollutants associated with project construction and/or operation. Sensitive receptor land uses generally include schools, day care centers, hospitals, and residential areas. Some sensitive receptors are considered to be more sensitive than others to air pollutants. The reasons for greater

TABLE 4.10-1
AMBIENT AIR QUALITY MONITORING SUMMARY (2011–2015)

Pollutant*	Standard	Monitoring Data by Year 2011	2012	2013	2014	2015
Ozone						
Maximum 1-hour concentration (ppm)	0.09 ppm	0.07	0.07	0.07	0.07	0.07
Days over State Standard		0	0	0	0	0
Maximum 8-Hour Average (ppm)	0.070 ppm	0.057	0.055	0.062	0.062	0.062
Days over State Standard		0	0	0	0	0
Respirable Particulate Matter (PM_{10})						
Maximum 24-Hour Average (µg/m^3)	150 µg/m^3	23	105	98	48	66
Estimated Days over National Standard		0	0	0	0	0
Fine Particulate Matter ($PM_{2.5}$)						
Maximum 24-Hour Average (µg/m^3)	35 µg/m^3	20	16	20	20	23
Estimated Days over National Standard Exceedances/Samples[e]		0	0	0	0	0
State Annual Average (µg/m^3)	12 µg/m^3	6	6	7	5	5
Nitrogen Dioxide (NO_2)						
Maximum Hourly Average (ppm) Highest 24-hour average, µg/m^3[c]	0.18 ppm	0.04	0.04	0.04	0.04	0.03
Days over State Standard Exceedances/Samples[e]		0	0	0	0	0
Carbon Monoxide (CO)						
Maximum 8-Hour Average (ppm)	9.0 ppm	0.99	1.39	-	-	-
Days over State Standard		0	0	-	-	-

NOTES:
"-" indicates that data were not collected for the year and are not available; ppm = parts per million; µg/m^3 = micrograms per cubic meter. Emissions data for ozone, $PM_{2.5}$, NO_2, and CO were collected at the Salinas No. 3 Monitoring Station, and the emissions data for PM_{10} were collected at the Hollister-Fairview Road Monitoring Station.

SOURCE: CARB, 2016a.

than average sensitivity include pre-existing health problems, proximity to emission sources, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, with associated greater exposure to ambient air quality.

Many locations along the various proposed pipeline segments would be adjacent to sensitive receptors, including residences. However, pipeline segments would be installed in a linear sequence and would progress at a rate of 150 feet to 250 feet per day, which would limit the duration of exposure for any given receptor to construction-related pollutants. In addition to the proposed pipelines, the MPWSP would include several facilities such as the MPWSP Desalination Plant, the aquifer storage and recovery (ASR) injection/extraction wells (ASR-5 and ASR-6 Wells), Carmel Valley Pump Station, Main System-Hidden Hills Interconnection Improvements, and the Ryan Ranch-Bishop Interconnection Improvements. Several of the proposed facilities are located in close proximity to sensitive receptors. The following paragraphs provide summary descriptions of the sensitive receptors in the vicinity of the proposed project components.

Subsurface Slant Wells

The closest sensitive receptors to the proposed slant wells in the CEMEX active mining area are residences at the Marina Dunes RV Park on Dunes Drive located approximately 0.4 mile (2,100 feet) south-southeast of the southern-most slant well site, and residences on Drew Street located approximately 0.5 mile (2,600 feet) south-southeast of the southern-most slant well site.

Source Water Pipeline

The section of the proposed Source Water Pipeline located along Charles Benson Road and Del Monte Boulevard would be between 0.1 mile (600 feet) and approximately 0.2 mile (1,100 feet) south of a rural residence on Neponset Road.

MPWSP Desalination Plant

The closest sensitive receptors to the proposed MPWSP Desalination Plant site are the two rural residences on Neponset Road located approximately 0.4 mile (2,200 feet) and 0.75 mile (3,900 feet) west of the site, respectively. Residences off Monte Road on the north bank of the Salinas River, the second closest set of sensitive receptors, are approximately 0.95 mile (5,000 feet) from the MPWSP Desalination Plant site.

New Desalinated Water Pipeline

The new Desalinated Water Pipeline would pass within 0.1 mile (600 feet) to 0.2 mile (1,100 feet) of two residences on Neponset Road. The southern 0.65 mile (3,500 feet) of the new Desalinated Water Pipeline alignment would be within 100 feet of residences and within 0.25 mile (1,350 feet) of Miss Barbara's Child Care Center at 266 Beach Road and the Marina Children's Center at 261 Beach Road.

New Transmission Main

The northernmost 0.5 mile (2,650 feet) of the new Transmission Main is within 100 feet of residences in Marina. The Crescita Early Education Center/Marina Child Development Center at 3066 Lake Drive in Marina is within 0.25 mile (1,300 feet) of the new Transmission Main alignment. South of the Highway 1 overpass where the new Transmission Main parallels the west side of the highway, the pipeline is 500 feet or more from the nearest sensitive land uses. Along Lightfighter Drive, the new Transmission Main would pass within 200 feet of a baseball field at California State University, Monterey Bay. Along General Jim Moore Boulevard, the pipeline would pass within 250 of residences along 4th Army Road, within 150 feet of Marshall West

Elementary School, within 100 feet of residences in the Fitch Park military housing area, and within 300 feet of Seaside Middle School.

ASR Pipelines

The ASR Conveyance Pipeline, ASR Recirculation Pipeline, and the ASR Pump-to-Waste Pipeline would be within 250 feet of Seaside Middle School, and within 50 to 100 feet of residences in the Fitch Park military housing area along Hatten Road and Ardennes Circle.

ASR-5 and ASR-6 Wells

The ASR-5 and ASR-6 Wells would each be within 50 feet of residences in the Fitch Park military housing area on Ardennes Circle.

Castroville Pipeline

The section of the proposed Castroville Pipeline along Charles Benson Road would be approximately 0.2 mile (1,100 feet) south of a residence on Neponset Road and a part of the pipeline in the Monterey TAMC right-of-ways would be approximately 250 feet from a residence along Neponset Road. On the east side of Salinas River, the Castroville Pipeline would pass adjacent to about a dozen residences. The pipeline would pass about 200 feet south of a residence along Nashua Road, approximately 300 west of a residence at Castroville Road, and would terminate approximately 700 feet southeast of residences in Cypress Court.

Carmel Valley Pump Station

Carmel Valley Pump Station would be within 150 of two residences along Rancho San Carlos Road.

Interconnections with Highway 68 Satellite Systems

The Ryan Ranch-Bishop Interconnection Improvements would be located in a business park area with few sensitive receptors, with the exception of the Ryan Ranch Children's Center and York School, both of which are located approximately 0.2 mile (1,000 feet) from the proposed improvements.

The proposed Main System-Hidden Hills Interconnection Improvements are located in a residential neighborhood, with residences located as close as 50 feet to the proposed pipeline route.

4.10.2 Regulatory Framework

This section provides an overview of federal, state, and local environmental laws, policies, plans, and regulations relevant to air quality. A brief summary of each is provided, along with a finding regarding the proposed project's consistency with those regulatory requirements. The consistency findings concern the proposed project, without mitigation. Where the project, as proposed, would be consistent with the applicable regulatory requirement, no further discussion of project consistency with that regulatory requirement is provided. Where the project, as proposed, would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to a specific impact discussion in Section 4.10.5, Direct and Indirect Effects of the Proposed Project, below, where the potential inconsistency is discussed in more detail. Where applicable, the discussion in Section 4.10.5 identifies feasible mitigation that would resolve or minimize the potential inconsistency.

Federal, state, and regional regulations provide the framework for analyzing and controlling air pollutant emissions and thus general air quality. The United States Environmental Protection Agency (USEPA) is responsible for implementing the programs established under the federal Clean Air Act, such as establishing and reviewing the federal ambient air quality standards and reviewing State Implementation Plans (SIPs), described further below. However, the USEPA has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented.

In California, the California Air Resources Board (CARB) is responsible for establishing and reviewing the state ambient air quality standards, developing and managing the California SIP, securing approval of this plan from the USEPA, and identifying TACs. CARB also regulates mobile emissions sources in California, such as construction equipment, trucks, and automobiles, and oversees the activities of air quality management districts, which are organized at the county or regional level. The MBUAPCD is the regional agency primarily responsible for regulating stationary emission sources at facilities within its geographic area (i.e., Monterey, Santa Cruz, and San Benito counties) and for preparing the air quality plans that are required under the federal Clean Air Act and the 1988 California Clean Air Act.

4.10.2.1 Federal and State Regulations

The federal Clean Air Act Amendments of 1977 established federal ambient air quality standards, and individual states retained the option to adopt more stringent standards and to include other pollution sources. California had already established its own air quality standards when federal standards were established, and because of the unique meteorological problems in California, there are considerable differences between some of the state and federal standards. As shown in **Table 4.10-2**, the state standards tend to be at least as protective as federal standards, and are often more stringent.

Federal ambient air quality standards (federal standards) exist for seven criteria air pollutants: ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. In addition, California has established state standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. The ambient air quality standards are intended to protect public health and welfare, and they specify the concentration of pollutants (with an adequate margin of safety) to which the public can be exposed without adverse health effects. They are designed to protect those segments of the public most susceptible to respiratory distress, referred to as sensitive receptors, including people with asthma, the very young, elderly, people weak from other illness or disease, or people engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels that are somewhat above the ambient air quality standards before adverse health effects are observed.

TABLE 4.10-2
STATE AND FEDERAL AMBIENT AIR QUALITY STANDARDS AND ATTAINMENT STATUS FOR NORTH CENTRAL COAST AIR BASIN

		State Standards		Federal Standards	
Pollutant	**Averaging Time**	**Concentration**	**Attainment Status**	**Concentration**	**Attainment Status**
Ozone	8 Hour	0.070 ppm	N-T	0.070 ppm	U*
	1 Hour	0.09 ppm	N-T	N/A	N/A
Carbon Monoxide	8 Hour	9.0 ppm	U	9 ppm	U
Nitrogen Dioxide	Annual Average	0.030 ppm	A	0.053 ppm	U
	1 Hour	0.18 ppm	A	0.100 ppm	U
Sulfur Dioxide	24 Hour	0.04 ppm	A	N/A	N/A
	3 Hour	N/A	N/A	0.5 µg/m^3	A
	1 Hour	0.25 ppm	A	0.075 ppm	A
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	N	N/A	N/A
	24 Hour	50 µg/m^3	N	150 µg/m^3	U
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	A	12.0 µg/m^3	U
	24 Hour	N/A	N/A	35 µg/m^3	U
Sulfates	24 Hour	25 µg/m^3	A	N/A	N/A
Lead	30-Day Average	1.5 µg/m^3	A	N/A	N/A
	3-Month Rolling Average	N/A	N/A	0.15 µg/m^3	U
Hydrogen Sulfide	1 Hour	0.03 ppm	U	N/A	N/A
Vinyl Chloride	24 Hour	0.01 ppm	U	N/A	N/A
Visibility Reducing Particles	8 Hour	Extinction of 0.23/km; visibility of 10 miles or more	U	N/A	N/A

NOTES: A = attainment; N = nonattainment; N-T = nonattainment-transitional; U = unclassified but attainment can be assumed; N/A = not applicable or no applicable standard; ppm = parts per million; µg/m^3 = micrograms per cubic meter.

* On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm. Attainment status is relative to the previous 0.075 ppm standard. USEPA will make recommendations on attainment designations for 2015 standard by October 1, 2016, and issue final designations October 1, 2017.

SOURCES: CARB, 2015 and CARB, 2016b

Federal Clean Air Act

The 1977 Clean Air Act (last amended in 1990; Title 42 United States Code Section 7401 et seq.) requires that regional planning and air pollution control agencies prepare a regional air quality plan to outline the measures by which both stationary and mobile sources of pollutants will be controlled to achieve all standards within the deadlines specified in the Clean Air Act.

The USEPA is responsible for implementing programs developed under the federal Clean Air Act, such as establishing and reviewing the federal standards for CO, ozone, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. The federal Clean Air Act also requires the USEPA to designate areas (counties or air basins) as attainment or non-attainment with respect to each criteria pollutant, depending on whether the area meets the federal standards. If an area is designated as non-attainment, it does not meet a federal standard and is required to create and maintain a SIP for achieving compliance with the applicable federal standard. Conformity to the SIP is defined under the 1990 Clean Air Act amendments as conformity with the plan's purpose in eliminating or reducing the severity and number of violations of the federal standards and achieving expeditious attainment of these standards.

The Clean Air Act General Conformity Rule helps states improve air quality in areas that do not attain the federal standards by ensuring that federal actions conform to the SIP. The MPWSP is not subject to the General Conformity Rule because it would be located in an area that meets federal standards and the area is not subject to a maintenance plan with conformity requirements.[1]

California Clean Air Act

The California Clean Air Act was approved in 1988 and requires each local air district in the state to prepare an air quality plan to achieve compliance with the state standards. CARB is the agency delegated responsibility for preparing and submitting the SIP to the USEPA. CARB also oversees air quality policies in California and has established state standards for NO_2, CO, PM_{10}, $PM_{2.5}$, SO_2, ozone, lead, sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. Similar to the USEPA, CARB designates counties or air basins in California as attainment or non-attainment with respect to the state standards.

Regulations for Mobile Sources of Air Pollutants

The following air quality regulations apply to mobile sources and are directly relevant to the project. On road vehicles with a gross vehicular weight rating of 10,000 pounds or greater shall not idle for longer than 5 minutes at any location (Title 13 California Code of Regulations (CCR) Section 2485). This restriction does not apply when vehicles remain motionless during traffic or when vehicles are queuing. Off-road equipment engines shall not idle for longer than 5 minutes (Title 13 CCR Section 2449(d)(3)). Exceptions to this rule include: idling when queuing; idling to verify that the vehicle is in safe operating condition; idling for testing, servicing, repairing or diagnostic purposes; idling necessary to accomplish work for which the vehicle was designed (such as operating a crane); and idling required to bring the machine to operating temperature as specified by the manufacturer.

1 The Phase 1 final rule to implement the 8-hour Ozone standard was published on April 30, 2004. The anti-backsliding provisions in that rule set forth specific requirements for areas that are designated attainment for the 8-hour Ozone standard and that were at the time of the 8-hour designations (generally June 15, 2004) either attainment areas with maintenance plans for the 1-hour standard, such as the Air Basin; or nonattainment for the 1-hour standard. Specifically, 40 CFR part 51, section 51.905(a)(3) and (4) requires these areas to submit a maintenance plan under section 110(a)(1) of the Clean Air Act. That maintenance plan must demonstrate maintenance for 10 years post designation; however, this maintenance plan does not carry with it any conformity obligations (unlike maintenance plans required under Section 175A of the Act).

Attainment Status

Under amendments to the federal Clean Air Act, USEPA has classified air basins or portions thereof as either "attainment" or "non-attainment" for each criteria air pollutant, based on whether or not the federal standards have been achieved. The California Clean Air Act, which is patterned after the federal Clean Air Act, also requires areas to be designated as "attainment" or "non-attainment" for the state standards. Thus, areas in California have two sets of attainment/ non-attainment designations: one set with respect to the federal standards and one set with respect to the state standards. Table 4.10-2 shows the attainment status of the Air Basin with respect to the federal and state ambient air quality standards for different criteria pollutants. As indicated in the table, the Air Basin is designated as attainment for all federal standards and is designated non-attainment for ozone and PM_{10} under the state standards.

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) provides for the long-term management of lands within California's coastal zone boundary. Of primary relevance to air quality is a Coastal Act policy requiring that new development be consistent with applicable air pollution control district or the State Air Resources Board requirements. A preliminary assessment of project consistency with this priority is provided here. Final determinations regarding project consistency are reserved for the Coastal Commission. The MPWSP subsurface slant wells would use electricity from PG&E's electrical power grid; therefore, these facilities would not be subject to air district or State requirements. As such, the project would be consistent with Coastal Act policies related to air quality.

4.10.2.2 Regional Agencies and Regulations

Monterey Bay Unified Air Pollution Control District

The MBUAPCD is the regional agency responsible for air quality regulation within the North Central Coast Air Basin (Air Basin). The MBUAPCD regulates air quality through its planning and review activities. The MBUAPCD has permit authority over most types of stationary emission sources and can require stationary sources to obtain permits, impose emission limits, set fuel or material specifications, and establish operational limits to reduce air emissions. The MBUAPCD regulates new or expanding stationary sources of toxic air contaminants.

State law assigns local air districts the primary responsibility for control of air pollution from stationary sources, under CARB's oversight. The MBUAPCD is responsible for developing regulations governing emissions of air pollution, permitting and inspecting stationary sources of air pollution, monitoring of ambient air quality, and air quality planning activities, including implementation of transportation control measures (MBUAPCD, 2008).

Air Quality Management Plan for the Monterey Bay Region

In 1991, the MBUAPCD adopted the *Air Quality Management Plan for the Monterey Bay Region* (AQMP) in response to the California Clean Air Act of 1988, which established specific planning requirements to meet the ozone standards. The California Clean Air Act requires that AQMPs be updated every 3 years. The MBUAPCD has updated the AQMP five times. The most recent update, the *Triennial Plan Revision 2009-2011* (2012 AQMP), was adopted in 2013 (MBUAPCD, 2013). The 2012 AQMP relies on a multilevel partnership of federal, State, regional, and local governmental agencies. These agencies (USEPA, CARB, local governments, Association of Monterey Bay Area Governments [AMBAG]), and the MBUAPCD are the primary agencies that implement the AQMP programs. The 2012 AQMP documents the MBUAPCD's progress toward attaining the state 8-hour ozone standard, which is more stringent than the state 1-hour ozone standard. The 2012 AQMP builds on information developed in past AQMPs and includes a review and update to the 2008 AQMP. The primary elements from the 2008 AQMP that were updated in the 2012 revision include the air quality trends analysis, emission inventory, and mobile source programs. The MPWSP would be potentially inconsistent with the 2012 AQMP because it would contribute to a temporary exceedance of an ozone ambient air quality standard. This issue is addressed in Impact 4.10-1.

Stationary emission sources continue to be the smallest portion of both the ROG and NO_x emissions inventories. Mobile sources are the main contributor to ROG and NO_x emissions in the region. The 2012 AQMP identifies a continued trend of declining ozone emissions in the Air Basin primarily related to lower vehicle miles traveled. Based on monitoring data for 2009-2011, there were fewer exceedance days in the time period 2009-2011 compared to 2006-2008. Therefore, the control measures presented in the 2008 AQMP have not been implemented because the MBUAPCD determined progress was continuing to be made toward attaining the 8-hour ozone standard (MBUAPCD, 2013).

Rules for Stationary Sources

The MBUAPCD regulates new and modified stationary sources through its Rule 207, which incorporates state and federal requirements for new and modified stationary sources as well as MBUAPCD-specific regulations. When net emissions from a new or modified facility exceed State offset thresholds (i.e., 10 tons per year for any criteria pollutant), the increase must be offset from an existing source, with certain exceptions, such as emergency internal combustion engines used during power outages or operated less than 60 hours per year for emergency pumping of water. Rule 207 also requires application of Best Available Control Technology when a source would emit 25 pounds per day or more of ROG or NO_x emissions. All proposed stationary diesel engines would be subject to the MBUAPCD's air toxic control measures, which require emission controls and limits on testing and maintenance. In addition, pursuant to Rule 1010, the MBUAPCD requires permits for all emergency standby engines. Rule 1010, Subsection 3.2.1.3.1, requires the following operating requirements and diesel particulate emission standards for new stationary emergency standby diesel engines over 50 horsepower (hp) (MBUAPCD, 2010):

- Diesel particulate matter limit of less than 0.15 grams per brake horsepower-hour; or
- Off-road Engine Certification Standard for an off-road engine of the same hp rating; and
- Less than 50 hours per year for non-emergency operation.

Permits to operate each of the proposed emergency generators would be secured by CalAm from MBUAPCD. Therefore, the MPWSP would be consistent with MBUAPCD Rules 207 and 1010.

Asbestos Program

The purpose of the Asbestos Program is to protect the public from uncontrolled emissions of asbestos through enforcement of the federal Asbestos Standard and Air District Rule 424. The Program covers most renovations and demolition projects and may be triggered if asbestos containing pipes or materials are encountered during open trenching for pipeline installations. Elements of the program include survey and notification requirements prior to beginning a project, as well as work practice standards and disposal requirements. The program operates on a "cradle to grave" basis through the regulation of all aspects related to the handling of asbestos materials from discovery and removal, through transportation and disposal (MBUAPCD, 2017).

4.10.2.3 Applicable Land Use Plans, Policies, and Regulations

Table 4.10-3 presents the regional and local land use plans, policies, and regulations pertaining to air quality relevant to the MPWSP that were adopted for the purpose of avoiding or mitigating an environmental effect and indicates project consistency with such plans, policies, and regulations. Where the analysis concludes the proposed project would not conflict with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes the project would be potentially inconsistent with the applicable plan, policy, or regulation, the reader is referred to the specific impact in Section 4.10.5, Direct and Indirect Effects of the Proposed Project). In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

TABLE 4.10-3
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO AIR QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System–Hidden Hills Interconnection Improvements, and Ryan Ranch–Bishop Interconnection Improvements	***Policy OS-10.6:*** The Monterey Bay Unified Air Pollution Control District's air pollution control strategies, air quality monitoring, and enforcement activities shall be supported.	This policy is intended to protect and enhance Monterey County's air quality.	<u>Potentially Inconsistent:</u> Construction activities in unincorporated Monterey County would generate emissions in the air basin that could conflict with implementation of the applicable air quality plan. This is addressed in Impact 4.10-1.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space		***Policy OS-10.8:*** Air quality shall be protected from naturally occurring asbestos by requiring mitigation measures to control dust and emissions during construction, grading, quarrying, or surface mining operations. This policy shall not apply to Routine and Ongoing Agricultural Activities except as required by state and federal law.	This policy is intended to protect and enhance Monterey County's air quality with respect to naturally occurring asbestos.	<u>Consistent:</u> The components of the MPWSP are not proposed in areas that are likely to contain naturally occurring asbestos.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space		***Policy OS-10.9:*** The County of Monterey shall require that future development implement applicable Monterey Bay Unified Air Pollution Control District control measures. Applicants for discretionary projects shall work with the Monterey Bay Unified Air Pollution Control District to incorporate feasible measures that assure that health-based standards for diesel particulate emissions are met. The County of Monterey will require that future construction operate and implement MBUAPCD PM_{10} control measures to ensure that construction-related PM_{10} emissions do not exceed the MBUAPCD's daily threshold for PM_{10}. The County shall implement MBUAPCD measures to address off-road mobile source and heavy duty equipment emissions as conditions of approval for future development to ensure that construction-related NO_x emissions from non-typical construction equipment do not exceed the MBUAPCD's daily threshold for NO_x.	This policy is intended to protect and enhance Monterey County's air quality with respect to criteria pollutants.	<u>Consistent:</u> Pursuant to Rule 1010, Subsection 3.2.1.3.1, emergency generators would be required to follow operating requirements and diesel particulate emission standards for new stationary emergency standby diesel engines over 50 hp (see Section 4.10.2.2). Construction-related PM_{10} emissions would be mitigated to ensure that emissions would not exceed the MBUAPCD's daily threshold for PM_{10}. Although NO_x emissions from all construction equipment would exceed the MBUAPCD's significance threshold, it is unlikely that emissions from only non-typical construction equipment would exceed the MBUAPCD's daily threshold for NO_x.
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 8.40 Air Pollution	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Section 8.40.030 Prohibited Discharges.*** A. No person shall discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour which is: 1. As dark or darker in shade as that designated as No. 2 on the Ringlemann Chart, as published by the United States Bureau of Mines; or 2. Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subdivision 1 of this subsection. B. No person shall discharge into the atmosphere from any single source particulate matter in excess of 0.4 grains per cubic foot of gas at a gas temperature of sixty degrees Fahrenheit and a gas pressure of 14.7 pounds per square inch absolute. C. No person shall discharge into the atmosphere from any single source of emission whatsoever sulfur compounds exceeding 0.2 percent by volume calculated as sulfur dioxide (SO_2) at the point of discharge.	This section is intended to protect the people of the city from undesirable air contaminants.	<u>Potentially Inconsistent:</u> Short-term construction activities in the city of Seaside would generate fugitive dust emissions that could conflict with this municipal code. This issue is addressed in Impact 4.10-1, which identifies mitigation measures that would minimize or avoid this potential inconsistency.
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 8.40 Air Pollution	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline	***Section 8.40.040: Nuisance declared – Abatement.*** No person shall discharge from any source whatsoever such quantities of air contaminants or other material as will: A. Cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or B. Endanger the comfort, repose, health, or safety of any such persons or public; or C. Cause or have a natural tendency to cause injury or damage to business or property. Such discharge is declared to be a public nuisance and shall be abated.	This section is intended to protect the people of the city from undesirable air contaminants.	<u>Potentially Inconsistent:</u> Short-term construction activities in the city of Seaside would generate fugitive dust and fuel exhaust emissions that could conflict with this municipal code. This issue is addressed in Impact 4.10-1, which identifies mitigation measures that would minimize or avoid this potential inconsistency.

SOURCE: Monterey County, 2010.

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4.10.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

This EIR/EIS relies on the significance criteria established by MBUAPCD to assess the impacts of the proposed project on air quality. Because the MBUAPCD is a responsible agency under CEQA, the criteria pollutant thresholds and analytical guidelines developed by the MBUAPCD are framed in the context of CEQA; however, given that the MPWSP is not subject to the federal General Conformity Rule because it would be located in an area that meets federal standards and the area is not subject to a maintenance plan with conformity requirements, a separate discussion of air quality analysis requirements for NEPA is not provided.

The MBUAPCD has adopted two different sets of CEQA guidelines: Guidelines for Implementing the California Environmental Quality Act (2016 guidelines) for the MBUAPCD's implementation of CEQA as a lead or responsible agency (MBUAPCD, 2016a), and CEQA Air Quality Guidelines (2008 guidelines) that provide guidance for lead agencies that prepare project-specific CEQA and NEPA documentation for projects within the air district (MBUAPCD, 2008). The 2016 guidelines establish criteria pollutant significance thresholds for construction emissions, which were not included in the 2008 guidelines. Although the purpose of the 2016 guidelines is to describe the MBUAPCD's procedures for enforcing CEQA, the MBUAPCD recommends that lead agencies use the new criteria pollutant mass emissions thresholds identified in the 2016 guidelines for projects that would include a large construction effort (MBUAPCD, 2016b).

Due to the substantial amount of project-related construction activities that would occur within the Air Basin, the CPUC and Sanctuary have determined that the criteria pollutant mass emissions significance thresholds identified in the MBUAPCD's 2016 guidelines are appropriate to evaluate the regional air quality impacts that would be associated with the project. The 2016 guidelines state that a project would not have a significant air quality effect on the environment if construction or operation of the project would emit less than 137 pounds per day of NO_x or ROG, 82 pounds per day of PM_{10}, 55 pounds per day of $PM_{2.5}$, or 550 pounds per day of CO.

For the purpose of this EIR/EIS analysis, the MBUAPCD considers temporary emissions of a carcinogenic TAC that can result in a hazard index greater than 1 for acute or chronic impacts and/or a cancer risk greater than 10 incidents per population of 1,000,000 to be significant (MBUAPCD, 2016a).

4.10.4 Approach to Analysis

Evaluation of potential impacts on air quality from construction and operation of the proposed project included reviewing relevant regulatory guidelines, characterizing the existing air quality environment throughout the project area, and estimating pollutant emissions from construction and operation of project facilities. Individual and cumulative impacts were assessed by comparing the MBUAPCD significance thresholds to estimated levels of pollutant emissions. The following discussions provide an overview of the approach to analysis for air quality impacts.

4.10.4.1 Consistency with Air Quality Plans

Any project that could conflict with the MBUAPCD's goal of attaining the state 8-hour ozone standard would be considered to conflict with the intent of the 2012 AQMP. The measures for determining whether a project would conflict with the intent of the 2012 AQMP is consistency with the CEQA mass emissions thresholds of significance for NO_x and ROG, and/or whether a project would contribute to population growth not accounted for in the 2012 AQMP. If the CEQA thresholds of significance are exceeded, or if the project would result in population growth not accounted for the 2012 AQMP, then the project would be considered to conflict with the intent of the 2012 AQMP and the associated impact would be significant.

4.10.4.2 Violate a Standard or Contribute to a Violation

Construction Emissions

For the purposes of this evaluation, the NO_x significance threshold represents emissions of all oxides of nitrogen, including NO_2. Given the low ambient levels of SO_2 and lead in the Air Basin, short-term construction-related SO_2 and lead emissions associated with the proposed project are not expected to result in significant effects and were not calculated.

For off-road equipment, emissions were estimated using the California Emissions Estimator Model version 2013.2.2 (CalEEMod v2013.2.2), with assumptions for construction equipment inventories, equipment horsepower ratings, and construction phasing developed by the CPUC and the Sanctuary in coordination with CalAm for this EIR/EIS analysis. It is assumed that each piece of equipment associated with construction of the proposed MPWSP Desalination Plant would operate for up to 12 hours per day, the drill rigs required to excavate the slant wells and ASR injection/extraction wells would operate for up to 24 hours per day, the other equipment required to construct the slant wells and associated facilities would operate for up to 12 hours per day, and construction equipment associated with all other proposed components (e.g., pipelines, pump stations, ASR facilities) would operate up to 8 hours per day. Emission factors for on-road trucks and worker vehicles were derived using CARB's EMFAC2014 Burden Model. The worst-case daily trip rates for each project component are presented in Table 4.9-4 of Section 4.9, Traffic and Transportation.

Emission factors and process information from *AP-42, Compilation of Air Pollutant Emission Factors* (USEPA, 2006) and the CalEEMod emissions model results were used to calculate fugitive dust emissions from project-related construction activities. Maximum daily fugitive dust emissions were evaluated for the following activities: general site preparation and earthmoving for the MPWSP Desalination Plant, subsurface slant wells, ASR-5 and ASR-6 Wells, Carmel Valley Pump Station, and Brine Mixing Box; soil handling associated with 1,250 feet of trenching for seven pipeline segments (assuming pipeline installation rates of 150 to 250 feet per day); and travel on unpaved roads. For general site preparation and earth-moving activities, an emission rate of 20 pounds of PM_{10} per acre graded per day was used (CARB, 2002). Fugitive dust that would be associated with pipeline trench excavation activities was estimated using emission factors of 0.001 pound PM_{10} and 0.0002 pound per $PM_{2.5}$ per cubic yard material handled based on the truck loading emission factor formula used by CalEEMod (CAPCOA, 2013). $PM_{2.5}$ fractions for soil disturbance activities developed by the South Coast Air Quality Management District (SCAQMD) were used to estimate $PM_{2.5}$ fugitive dust emissions that would be associated with site preparation activities (SCAQMD, 2006). Fugitive dust in the form of PM_{10} and $PM_{2.5}$ resulting from travel on unpaved roads was estimated using USEPA methodology identified in *AP-42, Compilation of Air Pollutant Emission Factors* (USEPA, 2006). The MBUAPCD does not recommend quantification of entrained road dust from travel on paved roads (MBUAPCD, 2008).

ROG off-gassing that would be associated with project-related asphalt paving activities was estimated using the CalEEMod emission factor of 2.62 pounds ROG per acre paved per day (CAPCOA, 2013).

Operational Emissions

Long-term emissions estimates for the proposed project were based on the proposed emergency generators at the MPWSP Desalination Plant site, and the Carmel Valley Pump Station, vehicle trips associated with commuting workers and truck deliveries, and off-road equipment use associated with periodic maintenance at the slant well sites. Although the emergency generators would be relatively large (between 68 hp and 1,000 hp), it is anticipated that operation of the generators would be limited to 50 hours per year per generator and less than 5 hours per month for testing per generator based on MBUAPCD requirements. Emission factors for the emergency generators were obtained from the dealer specifications of standby diesel generator sets similar to the size of the proposed emergency generators, with an adjustment to particulate emissions limits per MBUAPCD Rule 1010. Emissions associated with vehicle trips were estimated using emission factors derived from CARB's EMFAC2014 Burden Model. Vehicle trips associated with operation of the proposed facilities were estimated as part of the impact analysis presented in Section 4.9, Traffic and Transportation (see Table 4.9-4). For off-road equipment associated with operational maintenance of the slant wells that would be required every five years, emissions were estimated using CalEEMod v2013.2.2, under the assumption that four pieces of heavy-duty off-road equipment would operate between five and eight hours per day for periods of up to 18 weeks.

4.10.4.3 Impacts on Sensitive Receptors

Construction of the proposed project would result in short-term diesel exhaust emissions from onsite heavy duty equipment and from material deliveries and hauling of excess spoils and debris. Particulate exhaust emissions from diesel-fueled engines (i.e., DPM) were identified as a TAC by CARB in 1998. Construction of the project would pose a potential cancer and chronic health risk. These risks would primarily result when construction would be located in close proximity to sensitive receptors for an extended duration.

Construction of several components of the proposed project would occur in the immediate vicinity (i.e., within 1,000 feet) of sensitive receptor locations for durations ranging from several days to 6 months. Pipeline construction activities would proceed linearly at a rate of 150 feet to 250 feet per day, which would limit the duration of exposure for any given receptor. The three construction sites that pose the highest health risks include the Carmel Valley Pump Station and the ASR-5 and ASR-6 Wells. A health risk assessment was conducted for each of these three construction sites. The assessment includes estimations of DPM emissions based on PM_{10} exhaust emissions estimates made using the CalEEMod model that were then converted to maximum emissions concentrations, which were used to generate the maximum concentrations to estimate health risks. DPM concentrations for the three sites were modeled using the USEPA's AERMOD dispersion model (version 12060). The AERMOD modeling used several technical assumptions and inputs, including:

- rural dispersion coefficients;
- five years of meteorological data collected at the Monterey Airport from 2009 through 2013;
- PM10 emission rates for onsite construction exhaust estimated using CalEEMod;
- an area source (or sources) representing the construction area; and
- x, y, and z coordinates for sensitive receptors located in the project vicinity.

The maximum concentrations were converted to cancer and chronic health risks using the health risk assessment guidance issued by the California Office of Environmental Health Hazard Assessment (OEHHA, 2015) and the anticipated construction durations for each of the project facilities. The cancer risk estimate assumed a six-month exposure for sensitive receptors near the two pump station sites, with three months of exposure in the third trimester of pregnancy and three months in the 0 to 2 year age category. For the ASR-5 and ASR-6 Wells, a one-year DPM exposure period was used, with three months of exposure in the third trimester of pregnancy and nine months in the 0 to 2 year age category. For these three facilities the cancer risks for the third trimester assumed a daily breathing rate of 361 liters of air per kilogram of body weight-day, a child risk factor of 10, and 85 percent of the time spent at home. The health risk for the 0 to 2 year age category assumed a daily breathing rate of 1,090 liters of air per kilogram of body weight-day, a child risk factor of 10, and 85 percent of the time spent at home.

Operation of the proposed project would result in negligible long-term onsite TAC emissions, which would not be in the vicinity of any sensitive receptors that could pose a public health risk; therefore, the health risk analysis in this EIR/EIS relative to long-term project operations is qualitative.

4.10.5 Direct and Indirect Effects of the Proposed Project

Table 4.10-4 provides a summary of air quality impacts for the MPWSP.

TABLE 4.10-4
SUMMARY OF IMPACTS – AIR QUALITY

Impacts	Significance Determinations
Impact 4.10-1: Generate emissions of criteria air pollutants and contribute to a violation of an ambient air quality standard during construction.	SU
Impact 4.10-2: Construction activities could conflict with implementation of the applicable air quality plan.	SU
Impact 4.10-3: Expose sensitive receptors to substantial pollutant concentrations and/or *Coccidioides immitis* spores or create objectionable odors affecting a substantial number of people during construction.	LS
Impact 4.10-4: Long-term increase of criteria pollutant emissions that could contribute to a violation of an ambient air quality standard during operations.	LS
Impact 4.10-5: Expose sensitive receptors to substantial pollutant concentrations or create objectionable odors affecting a substantial number of people during operations.	LS
Impact 4.10-C: Cumulative impacts related to air quality.	SU

NOTES:
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation
SU = Significant and Unavoidable, even with implementation of mitigation

4.10.5.1 Construction Impacts

Impact 4.10-1: Generate emissions of criteria air pollutants that could contribute to a violation of an ambient air quality standard during construction. (*Significant and Unavoidable, even with implementation of mitigation*)

Project construction would involve the use of a variety of off-road diesel-fueled equipment, including graders, backhoes, excavators, loaders, etc., that would emit exhaust containing air pollutants at the construction sites. In addition, construction vehicles and workers' vehicles would generate exhaust emissions offsite, and fugitive dust would be generated by onsite ground disturbing and material handling activities as well as by truck travel on unpaved roads. Average daily emissions associated with the construction components that could occur simultaneously were combined to determine the "worst-case" scenario for daily emissions. The worst-case daily emissions scenario is estimated to occur in May and June of 2019 and includes simultaneous construction of the proposed subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Castroville Pipeline, Pipeline to CSIP, new Transmission Main, ASR Pipelines, ASR Injection and Extraction Wells, and Carmel Valley Pump Station. Emissions summaries are presented below for off-road (e.g., tractors, graders, backhoes) and on-road (i.e., light duty trucks and heavy haul trucks) exhaust sources as well as for sources of fugitive dust (e.g., dust entrainment from travel on unpaved roads and earth moving activities such as grading and excavation) and ROG off-gassing from paving. Assumptions used to estimate construction emissions are summarized in Section 4.10.4, above, and are presented in detail in **Appendix G1**. A summary of the estimated maximum daily construction emissions is presented in **Table 4.10-5**.

TABLE 4.10-5
ESTIMATED MAXIMUM DAILY CONSTRUCTION EMISSIONS (pounds/day)

Emission Source	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment and On-road Vehicle Exhaust*					
Desalination Plant	6.39	90.11	48.47	3.36	2.71
Subsurface Slant Wells	3.57	48.28	23.09	1.84	1.56
Source Water Pipeline	2.51	31.10	19.34	1.31	1.12
Brine Discharge Pipeline	2.34	26.99	17.21	1.18	1.04
Brine Mixing Box	2.34	26.99	17.21	1.18	1.04
Castroville Pipeline	2.39	27.59	17.61	1.19	1.06
Pipeline to CSIP	2.34	26.99	17.21	1.18	1.04
New Transmission Main	2.54	31.52	19.62	1.32	1.13
ASR Pipelines	2.47	30.74	19.10	1.30	1.10
ASR Injection and Extraction Wells	1.45	20.36	10.73	0.70	0.55
Carmel Valley Pump Station	1.09	13.62	7.56	0.51	0.44
Subtotal	29.41	374.27	217.14	15.05	12.79
Fugitive Dust	N/A	N/A	N/A	189.88	36.04 27.56
Off-gassing from Paving	4.53	N/A	N/A	N/A	N/A
Total	**33.94**	**374.27**	**217.14**	**204.93**	**40.35**
MBUAPCD CEQA Significance Threshold	137	137	550	82	55
Exceeds Threshold Without Mitigation?	No	Yes	No	Yes	No
Exceeds Threshold With Mitigation?	No	Yes	No	No	No

NOTE: N/A = not applicable.

* The on-road vehicle emissions of PM_{10} and $PM_{2.5}$ identified in this table include emissions associated with break and tire wear.

SOURCE: ESA, 2017. See **Appendix G1**.

Gaseous Criteria Pollutant Emissions

As shown in Table 4.10-5, maximum daily construction equipment and vehicle exhaust emissions of NO_x would be approximately 374 pounds per day, which would exceed the MBUAPCD's significance threshold of 137 pounds per day, resulting in a significant impact. Emissions of ROG and CO would not exceed the MBUAPCD's respective significance criteria; therefore, impacts associated with these pollutants would be less than significant. Implementation of **Mitigation Measures 4.10-1a (Equipment with High-Tiered Engine Standards), 4.10-1b (Idling Restrictions)**, and **4.10-1e (Off-site Mitigation Program)** would reduce NO_x emissions by requiring CalAm and/or its construction contractor(s) to make a good faith effort to use construction equipment that meets the highest USEPA-certified tiered emission standards, to ensure on-road and off-road equipment idling is minimized, and to fund an off-site mitigation program. Although the exact amount of mitigated emissions cannot be substantiated at this time due to the uncertainty in equipment availability and unknown feasibility of the off-site mitigation program, for informational purposes, if compliance with Mitigation Measure 4.10-1a would result in equipment emissions that would be equivalent to those that would be associated with use of engines that comply with Tier 3 engine standards, implementation of this mitigation measure would decrease maximum daily construction emissions of NO_x to approximately 316 pounds per day, which would continue to result in a significant impact with respect to contributing to an exceedance of an ozone and/or NO_2 ambient air quality standard. With regard to the emission reductions that would be associated with Mitigation Measure 4.10-1b, because the emission estimates summarized in Table 4.10-5 do not include emissions associated with idling vehicles, implementation of this measure would not reduce NO_x exhaust emissions calculated for the proposed project. In addition, it cannot be substantiated at this time that off-site mitigation in the form of emissions offsets is feasible given the schedule of proposed construction activities and schedule uncertainties associated with implementing such a program; therefore, off-site emission reductions that would be associated with Mitigation Measure 4.10-1e cannot be quantified.

Particulate Matter

The majority of PM_{10} construction emissions would result from fugitive dust associated with earth moving activities and vehicle travel on unpaved roadways. The worst-case scenario assumes that a total of up to approximately 3.8 acres would be disturbed on the maximum emissions day by grading and other earthmoving site preparation activities at the proposed MPWSP Desalination Plant (2 acres per day), slant wells (1 acre), Brine Mixing Box (0.5 acre), ASR facilities (0.25 acre), and Carmel Valley Pump Station (0.08 acre) sites. Regarding pipeline installation activities, it is assumed that a maximum of 3,556 cubic yards of soil material would be handled each day to excavate and backfill the pipeline trenches. For motor vehicle travel on unpaved roads, it is assumed that there would be a maximum of approximately 57 miles of vehicle travel on unpaved roads associated with construction of the subsurface slant wells and Castroville Pipeline.

As identified in Table 4.10-5, estimated maximum daily construction emissions of PM_{10} would be approximately 205 pounds per day, which would exceed the MBUAPCD's significance threshold of 82 pounds per day, resulting in a significant impact. Emissions of $PM_{2.5}$ would not exceed the MBUAPCD's respective significance criterion; therefore, impacts associated with this pollutant would be less than significant. Implementation of **Mitigation Measures 4.10-1a** and **4.10-1b** would reduce PM_{10} exhaust emissions by requiring CalAm and/or its construction contractor(s) to make a good faith effort to use construction equipment that meets the highest USEPA-certified tiered emission standards as well as to ensure on-road and off-road equipment idling is minimized. Implementation of Mitigation Measure 4.10-1a would decrease the maximum daily construction exhaust emissions of PM_{10} identified in Table 4.10-5 by approximately 2 pounds per day, while the decrease that would be associated with implementation of Mitigation Measure 4.10-1b cannot be quantified (see above).

With regard to reducing PM_{10} emissions of fugitive dust, **Mitigation Measure 4.10-1c (Construction Fugitive Dust Control Plan)**, would require CalAm to implement a comprehensive construction dust control plan. It is estimated that implementation of the Construction Fugitive Dust Control Plan would decrease fugitive dust emissions during earth disturbance activities by 65 percent, and would decrease unpaved road travel fugitive dust emissions in the vicinity of the subsurface slant wells at the CEMEX active mining area and the access road to the Castroville Pipeline by as much as 75 percent based on mitigation control efficiency factors published by SCAQMD (SCAQMD, 2007; see **Appendix G1** for all mitigation reduction assumptions).

It is estimated that implementation of Mitigation Measures 4.10-1a through 4.10-1c (see below) would reduce maximum daily construction emissions of PM_{10} to approximately 68 pounds per day, which would be below the MBUAPCD PM_{10} significance threshold of 82 pounds per day. It should be noted that if CalAm is unsuccessful securing all equipment with Tier 4 engine standards, the PM_{10} emissions would continue to be less than significant, given the relatively low potential emission reductions that would be associated with Mitigation Measure 4.10-1a compared to Mitigation Measure 4.10-1c. Therefore, with implementation of mitigation, it can be concluded that short-term emissions associated with construction of the MPWSP would not contribute to an exceedance of a PM_{10} state or federal standard. Therefore, this impact would be mitigated to a less-than-significant level.

Consistency with Regulatory Requirements

As noted in Section 4.10.2, Regulatory Framework, the MPWSP would be potentially inconsistent with City of Seaside Municipal Code Sections 8.40.030 and 8.40.040. **Mitigation Measures 4.10-1a** through **4.10-1e** would reduce pollutant emissions, but project-related construction emissions could still be inconsistent with these municipal code sections.

Impact Conclusion

Short-term emissions associated with construction of the proposed project could contribute to an exceedance of a state and/or federal standard for ozone, NO_2, and, PM_{10} based on the estimated maximum daily mass emissions levels presented in Table 4.10-5, which would exceed the MBUAPCD significance threshold for PM_{10}. However, this impact with respect to the ozone and NO_2 standards would be significant and unavoidable even with implementation of Mitigation Measures 4.10-1a and 4.10-1b. This significant impact could increase the susceptibility of sensitive individuals to respiratory infections. With respect to the PM_{10} standards, this impact would be reduced to a less-than-significant level with implementation of Mitigation Measures 4.10-1a through 4.10-1c. Short-term construction emissions associated with other criteria pollutants, including ROG, CO, and $PM_{2.5}$, would not be expected to contribute to an exceedance of an ambient air quality standard and the associated impact for all other criteria pollutants would be less than significant.

Mitigation Measures

Mitigation Measure 4.10-1a applies to all of the proposed project components.

Mitigation Measure 4.10-1a: Equipment with High-Tiered Engine Standards.

For diesel-fueled off-road construction equipment of more than 50 horsepower, CalAm and/or its construction contractor shall make a good faith effort to use available construction equipment that meets the highest USEPA-certified tiered emission standards or is alternatively powered (e.g., with electricity, natural gas, propane, methanol and ethanol blends, or gasoline) construction equipment. For all pieces of equipment that would neither meet Tier 4 emission standards nor be alternatively powered, CalAm or its construction contractor shall provide to the CPUC documentation from two local heavy construction equipment rental companies that indicate that the companies do not have access to higher-tiered equipment or alternatively powered equipment for the given class of equipment. Such documentation shall be provided to the CPUC at least two weeks prior to the anticipated use of those pieces of equipment.

Mitigation Measure 4.10-1b applies to all proposed project components.

Mitigation Measure 4.10-1b: Idling Restrictions.

In order to ensure that idling time for on road vehicles with a gross vehicular weight rating of 10,000 pounds or greater does not exceed the 5-minute limit established in Section 2485 of Title 13 CCR Section 2485, and that idling time for off-road engines does not exceed the 5-minute limit established in Title 13 CCR Section 2449(d)(3), CalAm and/or its construction contractor(s) shall prepare and implement a written idling policy and distribute it to all equipment operators. The idling policy shall extend the 5-minute idling limit to cover all on road vehicles (regardless of gross vehicular weight rating) and shall further require that for all diesel-powered off-road engines, the idling limit is reduced to 2 minutes, while maintaining the exceptions specified in Title 13 CCR Section 2449(d)(3). Clear signage of these requirements shall be provided for construction workers at all access points to construction areas.

Mitigation Measure 4.10-1c applies to all of the proposed project components.

Mitigation Measure 4.10-1c: Construction Fugitive Dust Control Plan.

CalAm shall require its construction contractor(s) to implement a dust control plan that includes, at minimum, the following dust control measures:

- Water all active construction areas at least three times daily;
- Cover all trucks hauling soil, sand, and other loose materials and require trucks to maintain at least 2 feet of freeboard;
- Apply water three times daily, or apply (non-toxic) soil stabilizers, on unpaved access roads, parking areas, and staging areas at construction sites;
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites;
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets;

- Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more);
- Enclose, cover, or water twice daily exposed stockpiles (dirt, sand, etc.);
- Limit traffic speeds on unpaved roads to 15 miles per hour;
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways;
- Replant native, drought-tolerant vegetation in disturbed areas as quickly as possible;
- Wheel washers shall be installed and used by truck operators at the exits of the construction sites to the MPWSP Desalination Plant, the slant wells, and the ASR well facilities; and
- Post a publicly visible sign that specifies the telephone number and person to contact regarding dust complaints. This person shall respond to complaints and take corrective action within 48 hours. The phone number of the Monterey Bay Unified Air Pollution Control District (MBUAPCD) shall also be visible to ensure compliance with MBUAPCD rules.

Mitigation Measure 4.10-1e applies to all of the proposed project components.

Mitigation Measure 4.10-1e: Off-site Mitigation Program.

CalAm shall work with the Monterey Bay Air Resources District (MBARD) and put forth a good faith effort to fund an off-site mitigation program that would be contemporaneous with project construction to offset construction-related NO_x. CalAm shall provide to the lead agencies documentation showing that it has reached an agreement with MBARD to fund an off-site emissions mitigation program that shall include offsets to be executed during construction of the project. If such a program is determined by CalAm and MBARD to be infeasible given the construction schedule of the project, CalAm shall provide documentation to the Lead Agencies that substantiates such a determination. All documentation shall be provided to the Lead Agencies at least two weeks prior to the commencement of construction.

Impact 4.10-2: Construction activities could conflict with implementation of the applicable air quality plan. (*Significant and Unavoidable, even with implementation of mitigation*)

The most recently adopted air quality plan for the project area is the 2012 AQMP. The 2012 AQMP documents the MBUAPCD's progress toward attaining the state 8-hour ozone standard. Any project that could conflict with the MBUAPCD's goal of attaining the state 8-hour ozone standard would be considered to conflict with the intent of the 2012 AQMP. To determine whether construction of the proposed project would conflict with the intent of the 2012 AQMP, construction emissions were compared to the MBUAPCD thresholds for the ozone precursors NO_x and ROG.

As presented in the previous impact discussion, the project-related short-term construction emissions with mitigation measures incorporated would exceed the significance threshold for

NO_X (see Impact 4.10-1, above); therefore, the project would not support the primary goal of the 2012 AQMP, and the impact associated with conflicting or obstructing implementation of the applicable air quality plan would be significant.

Consistency with Regulatory Requirements

As noted in Section 4.10.2, Regulatory Framework, the MPWSP would be potentially inconsistent with the 2012 AQMP, which was established to reduce ozone emissions to below ambient air quality standards, because it could contribute to a temporary exceedance of an ozone ambient air quality standard. As discussed in the preceding paragraphs, **Mitigation Measures 4.10-1a**, **4.10-1b, and 4.10-1e** would reduce ozone precursor emissions, but not to the extent that impacts contributing to ozone standard exceedances would be avoided.

Impact Conclusion

As identified under Impact 4.10-1, implementation of **Mitigation Measures 4.10-1a, 4.10-1b, and 4.10-1e** would not reduce project-related NO_X emissions to below the significance threshold. Therefore, this impact is considered to be significant and unavoidable, even with implementation of mitigation.

Mitigation Measures

Mitigation Measure 4.10-1a applies to the project as a whole.

> **Mitigation Measure 4.10-1a: Equipment with High-Tiered Engine Standards.**
>
> (See Impact 4.10-1, above, for description.)

Mitigation Measure 4.10-1b applies to all project components.

> **Mitigation Measure 4.10-1b: Idling Restrictions.**
>
> (See Impact 4.10-1, above, for description.)

Mitigation Measure 4.10-1e applies to all project components.

> **Mitigation Measure 4.10-1e: Off-site Mitigation Program.**
>
> (See Impact 4.10-1, above, for description.)

Impact 4.10-3: Expose sensitive receptors to substantial pollutant concentrations and/or *coccidioides immitis* spores or create objectionable odors affecting a substantial number of people during construction. (*Less than Significant*)

Sensitive Receptor Exposure to TACs

Construction of the proposed project would result in the short-term generation of DPM emissions from the use of off-road diesel equipment. These emissions could result in the short-term exposure of local sensitive receptors to TACs (i.e., DPM). The dose to which receptors are exposed is the primary factor affecting health risk from TACs. Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance.

As discussed in Section 4.10.4, the two construction sites that pose the greatest health risks include the Carmel Valley Pump Station and the ASR Injection/Extraction Wells site. PM_{10} exhaust emissions are conservatively used here as a surrogate for DPM. AERMOD, as described in Section 4.10.4, was used to estimate maximum annual PM_{10} concentrations at sensitive receptors in the vicinity of these sites and those concentrations were then converted to health risks. **Table 4.10-6** shows the maximum estimated DPM concentrations for each construction site as well as the associated estimated cancer risks and chronic health hazards. Construction of the Carmel Valley Pump Station would pose a cancer risk of 5.2 per million and a chronic health hazard of 0.027. Construction of the ASR Injection/Extraction Wells would pose a maximum cancer risk of 6.4 per million and a chronic health hazard of 0.034. For both sites, all values are less than the cancer risk and health hazard index significance thresholds established by the MBUPACD (i.e., the proposed project would not result in a hazard index greater than 1 for acute or chronic impacts and/or cancer risk greater than 10 incident per 1,000,000 population). Therefore, impacts associated with the proposed project's potential to expose sensitive receptors to substantial pollutant concentrations would be less than significant.

TABLE 4.10-6
MAXIMUM DPM CONCENTRATIONS, CANCER RISKS, AND CHRONIC HEALTH INDICES

Construction Site	Maximum DPM Concentration (μg/m^3)	Cancer Risk (per million)	Chronic Health Index
Carmel Valley Pump Station	0.137	5.2	0.027
ASR Injection/Extraction Wells Site	0.168	6.4	0.034
Significance Threshold	---	10	1

SOURCE: ESA, 2016. See **Appendix G1**.

Sensitive Receptor Exposure to Coccidioides Immitis Spores

Construction activities that include ground disturbance would have the potential to release coccidioides immitis spores. However, it is likely that much of the population of Monterey County has already been exposed to Valley Fever and would continue to be exposed because of the various earthmoving activities that have historically occurred and continue to occur as a result of agricultural and construction activities throughout the region. As a result of the endemic nature of the disease and the number of earthmoving activities in the County (e.g., grading and excavation for agriculture, as well as new residential, commercial, and industrial development, and surface mining operations), there are new cases of Valley Fever documented in the County each year; however, many people who are exposed do not develop symptoms.

Valley Fever-related impacts associated with the project would not be considered significant because ongoing ground-disturbing activities in the County currently represent a continual source of spores that contribute to the low number of Valley Fever cases reported each year. Construction activities associated with the project would result in similar localized ground disturbing activities to those that occur continually within the County and the project would not result in a substantial increase in spore release. Therefore, construction of the project would not represent an increased risk to public health. In addition, implementation of Mitigation Measure 4.10-1c (see above), which requires implementation of fugitive dust control measures, would ensure that fugitive dust that could contain coccidioides immitis spores would be controlled to the maximum extent feasible. Valley Fever-related impacts would be less than significant.

Sensitive Receptor Exposure to Odors

Construction activities that would be associated with the proposed project could result in temporary odors from use of diesel-fueled equipment. These odors would be temporary and would dissipate quickly, and would be unlikely to create objectionable odors that would affect a substantial number of people.

Impact Conclusion

Short-term construction activities that would be associated with the MPWSP would not expose sensitive receptors to substantial pollutant concentrations or substantial increased risk associated with coccidioides immitis spores, and would not create objectionable odors that would affect a substantial number of people. The associated impact would be less than significant.

Mitigation Measures

None required.

4.10.5.2 Operational and Facility Siting Impacts

The proposed project would not conflict with or obstruct implementation of the applicable air quality plan during project operations. With regard to long-term operations, there would be no permanent stationary sources of air pollutant emissions associated with the proposed project, with the exception of emergency generator testing, and mobile sources would be limited. In addition, any additional growth that could be served by the proposed project would be consistent with the levels of growth anticipated in the adopted land use plans of jurisdiction in CalAm’s Monterey District service area (see Section 6.3, Growth-Inducement). For these reasons, long-term operation of the proposed project would not conflict with or obstruct implementation of the 2012 AQMP and this issue is not addressed further in this EIR/EIS.

Impact 4.10-4: Long-term increase of criteria pollutant emissions that could contribute to a violation of an ambient air quality standard during operations. (*Less than Significant*)

Operation of the proposed project would rely on electrical power supplied from Pacific Gas and Electric Company (PG&E)’s existing regional power grid. It is generally not possible to determine the exact generation source(s) of electricity on the power grid that would supply the proposed project, or whether or not the electricity would even be generated within the Air Basin. Therefore, indirect emissions of criteria pollutants associated with electricity use from the regional power grid are not addressed in this air quality analysis because it would be impractical/impossible to do so.

MPWSP Desalination Plant, Carmel Valley Pump Station, and ASR Pump Station

Direct emission sources that would be associated with the proposed project include on-road vehicles, emergency generators at the MPWSP Desalination Plant, and the Carmel Valley Pump Station, and off-road equipment required for period maintenance of the slant wells. Mobile emission sources would include the daily commute trips of up to 30 facility operators and support personnel and three daily delivery truck trips that would be required to operate the desalination facilities. It is estimated that these activities would result in approximately 60 light-duty one-way truck trips and 6 heavy-duty one-way truck trips each day. Estimated mobile source emissions associated with the operations of the proposed project are presented below in **Table 4.10-7**. Refer to **Appendix G1** for the calculation sheets that were used to estimate the operational emissions that would be associated with the proposed project.

TABLE 4.10-7
PROPOSED PROJECT OPERATIONAL EMISSIONS (pounds/day)

Source	ROG	NO_x	CO	PM_{10}	$PM_{2.5}$
On-road Vehicle Exhaust	0.09	1.46	2.36	0.10	0.04
Emergency Generator Testing	0.32	16.92	1.93	1.10	1.02
Slant Well Maintenance (off-road equipment)	0.94	8.28	6.30	0.31	0.29
Total	**1.35**	**26.66**	**10.59**	**1.51**	**1.35**
MBUAPCD CEQA Significance Threshold	137	137	550	82	55
Exceeds Threshold Without Mitigation?	No	No	No	No	No

NOTE: N/A = no applicable threshold.

SOURCE: ESA, 2016. See **Appendix G1**.

The only onsite emission sources that would be associated with the proposed project would be stand-by emergency diesel generators that would be installed at the MPWSP Desalination Plant and the Carmel Valley Pump Station to provide emergency back-up power, as well as off-road equipment that would be required every five years to maintain the slant wells. Securing permits from the MBUAPCD for the emergency standby generators would ensure less-than-significant operational impacts related to the use of such generators through adherence to MBUAPCD Rule 1010. Estimated emissions that would be associated with emergency generator testing and off-road equipment are presented above in Table 4.10-7.

All Other Proposed Project Components

None of the other proposed project components would result in the direct emission of criteria pollutants during operations and maintenance. Therefore, no impact would result.

Impact Conclusion

As identified in Table 4.10-7, combined operational emissions that would be associated with the MPWSP Desalination Plant, Carmel Valley Pump Station, and the slant wells would not exceed any of the significance thresholds; therefore, operational emissions would not be expected to result in or contribute to an exceedance of an ambient air quality standard and the associated impact would be considered to be less than significant. No impact would result from operation and maintenance of all other project components.

Mitigation Measures

None required.

Impact 4.10-5: Expose sensitive receptors to substantial pollutant concentrations or create objectionable odors affecting a substantial number of people during operations. (*Less than Significant*)

Sensitive Receptor Exposure to TACs

MPWSP Desalination Plant and Carmel Valley Pump Station. The only onsite DPM emissions sources that would be associated with the MPWSP would be the emergency generators at the MPWSP Desalination Plant and the Carmel Valley Pump Station. DPM emissions (in the form of $PM_{2.5}$) from routine testing and maintenance of these emergency generators would be less than 1 pound per day and would average up to 0.03 pound per day on an annual basis. Given the negligible amount of emissions that would be generated, long-term operations of the emergency generators would not exceed the MBUAPCD TAC significance threshold (i.e., the proposed project would not result in a hazard index greater than 1 for acute or chronic impacts and/or cancer risk greater than 10 incident per 1,000,000 population). Therefore, overall, the increased health risk from long-term project DPM emissions would be negligible and this impact would be less than significant.

All Other Proposed Facilities. None of the other proposed project facilities would include onsite DPM emissions sources, or emission sources of other TACs. Therefore, no impact related to the exposure of sensitive receptors to substantial pollutant concentrations would result from operation of all other project facilities.

Objectionable Odors

MPWSP Desalination Plant and ASR Wells. The chemical storage and chemical feed facilities at the MPWSP Desalination Plant and ASR-5 and ASR-6 wells would be closed systems. For open-air facilities, such as the backwash treatment facilities and residuals handling systems, including the sludge drying beds, odors would generally be managed through operational controls, such as to reduce detention times in basins. Operators could also use chemical stabilization techniques to control odor. For example, they could apply chemicals such as lime directly to the sludge drying bed and prevent odors from releasing to the atmosphere. Additionally, the MPWSP Desalination

Plant would be co-located with the MRWPCA Regional Treatment Plant and the Monterey Regional Environmental Park, which are currently sources of odors in the area.

While operation of the MPWSP Desalination Plant could result in limited onsite odors associated with sludge management, due to the lack of nearby sensitive receptors in the immediate vicinity and the location of the site within an industrialized area that is an existing source of odor, the proposed project would not be expected to create objectionable odors that would affect a substantial number of people.

All Other Proposed Facilities. None of the other proposed project facilities would include onsite odor sources. Therefore, no impact related to the objectionable odors affecting a substantial number of people would result from operation of all other project facilities.

Impact Conclusion

Long-term operations that would be associated with the MPWSP would not expose sensitive receptors to substantial pollutant concentrations or create objectionable odors that would affect a substantial number of people. The impact would be less than significant.

Mitigation Measures

None required.

4.10.6 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects.

Impact 4.10-C: Cumulative impacts related to air quality (*Significant and Unavoidable, even with implementation of mitigation*)

The geographic scope of analysis for potential cumulative air quality impacts is the North Central Coast Air Basin. As indicated in Table 4.10-2, the air basin does not attain the state standards for ozone or PM_{10}; however, it attains (or is unclassified for) all federal standards. Therefore, existing conditions in the air basin are considered to be cumulatively significant with respect to attaining the state standards for ozone and PM_{10}. The timeframe during which the MPWSP could contribute to cumulative air quality effects includes the construction phase, as well as the anticipated approximately 40-year operations phase.

In developing thresholds of significance for air pollutants, MBUAPCD considered the emission levels for which a project's individual emissions would be cumulatively significant. Based on MBUAPCD thresholds and CEQA guidance, if individual project emissions would exceed the identified significance thresholds, a significant cumulative air quality impact would occur and the project's contribution to the cumulative impact would be considered significant. If project emissions would not exceed the significance thresholds, the project's incremental contribution to any potential cumulative impact would not be significant.

Cumulative Construction Impacts

As described in the Impact 4.10-1 discussion, MPWSP construction activities would generate short-term NO_x emissions in quantities that would exceed the MBUAPCD threshold, even with implementation of **Mitigation Measures 4.10-1a (Equipment with High-Tiered Engine Standards)**, **4.10-1b (Idling Restrictions)**, and **4.10-1e (Off-site Mitigation Program)**. Therefore, the cumulative impact of project construction emissions associated with the potential to contribute to a violation of an ambient air quality standard and conflict with implementation of the applicable air quality plan and would be significant when combined with the emissions associated with the cumulative projects in Table 4.1-2, and the MPWSP's incremental contribution to the cumulative impact would be cumulatively significant. No further feasible mitigation measures are available that would reduce the project's significant cumulative impact to a less than significant level *(significant and unavoidable)*.

With regard to emissions of PM_{10}, proposed project emissions would be significant and would therefore result in a significant cumulative impact. However, **Mitigation Measures 4.10-1a** through **4.10-e** would reduce emissions of PM_{10} during MPWSP construction activities to a level that would be below the MBUAPCD threshold. The air quality construction thresholds established by MBUAPCD were designed for the North Central Coast Air Basin and are intended to address the incremental contributions of individual projects on the quality of the air basin as a whole. Therefore, conformance with the MBUAPCD threshold ensures that an individual project would not have a cumulative impact with respect to overall air quality within the air basin. As a result, the MPWSP's incremental contribution of construction-related PM_{10} emissions would result in a less than significant cumulative impact.

With regard to impacts on sensitive receptors, the total diesel particulate matter (DPM) and fugitive dust emissions exposure periods from onsite equipment that would be required to construct MPWSP components would be limited to between several days and 24 months depending on the specific facility (see Impact 4.10-3 discussion relative to sensitive receptor exposure to TACs and coccidioides immitis spores). Nearby cumulative projects with construction schedules that overlap with the MPWSP would also be expected to expose sensitive receptors to DPM emissions and coccidioides immitis spores. While these emissions could be substantial, they would be temporary and generally limited to a period of a couple years or less for a given project. In addition, the project would not result in a substantial increase in spore release relative to localized ground disturbing activities associated with the cumulative projects. Also, none of the cumulative project locations illustrated in Figure 4-1, *Cumulative Projects,* would be located within 0.5 mile of the ASR Injection/Extraction or Carmel Valley Pump Station construction sites. The effects of MPWSP construction and cumulative projects would not be expected to result in long-term exposure of sensitive receptors to TAC emissions. As a result, a less than significant cumulative impact would occur from the identified projects.

In addition, construction of the MPWSP would result in diesel emissions-based odors, which would result in a negligible and short-term effect on nearby sensitive receptors (see Impact 4.10-3 discussion relative to sensitive receptor exposure to odors). Cumulative projects could also contribute to increases in diesel emissions-based odors. However, as noted previously, such increases would be limited in duration and extent. As a result, a less than significant cumulative effect related to odors would occur from the proposed project.

Cumulative Operational Impacts

Noted previously, pursuant to MBUAPCD CEQA Guidelines, a project's operational emissions would result in a significant cumulative impact if they exceed adopted significance thresholds. As discussed in Impacts 4.10-4 and 4.10-5, MPWSP operations would not cause emissions that would exceed the MBUAPCD significance thresholds. Therefore, the MPWSP would have a less than significant cumulative impact related to emissions of criteria pollutants.

With regard to impacts on sensitive receptors, onsite DPM emissions from project operation would be limited to emergency generators at the MPWSP Desalination Plant and the Carmel Valley Pump Station. DPM emissions (in the form of $PM_{2.5}$) from routine testing and maintenance of these emergency generators would be less than 1 pound per day and would average up to 0.03 pound per day on an annual basis. As discussed in Impact 4.10-5, such emissions would be negligible and would result in a less than significant cumulative impact.

Also discussed in Impact 4.10-5, MPWSP operation would not contribute substantially to offsite exposure of sensitive receptors to objectionable odors. To the extent the MPWSP would result in any objectionable odors, they would likely result from MPWSP Desalination Plant operation. The MPWSP Desalination Plant site is located within an industrial area with no sensitive receptors in the immediate vicinity. As a result, the MPWSP would result in a less than significant cumulative impact with respect to TACs or odors.

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4.11 Greenhouse Gas Emissions

Sections	Tables
4.11.1 Setting/Affected Environment	4.11-1 California GHG Emissions
4.11.2 Regulatory Framework	4.11-2 Summary of Impacts – GHG Emissions
4.11.3 Evaluation Criteria	4.11-3 Total GHG Emissions from Project Construction
4.11.4 Approach to Analysis	4.11-4 Total GHG Emissions from Project Operations
4.11.5 Direct and Indirect Effects of the Proposed Project	4.11-5 Total Amortized GHG Emissions
4.11.6 Cumulative Effects of the Proposed Project	

This section evaluates issues related to greenhouse gas (GHG) emissions resulting from implementation of the Monterey Peninsula Water Supply Project (MPWSP or proposed project). The section presents an overview of climate change; describes the various GHGs that have been identified as sources of climate change; discusses pertinent regulations, including those relevant at the federal and state levels; identifies the criteria used for determining the significance of environmental impacts; and analyzes the potential GHG impacts that would be associated with implementation of the MPWSP. Mitigation measures are prescribed to address significant impacts. For discussion of effects related to climate change-induced sea level rise, refer to the *Coastal Flooding and Sea Level Rise* discussion in Section 4.3.1.4 and Impact 4.3-11, *Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise*, in Section 4.3.5.2.

The CPUC received several comment letters related to the GHG emissions analysis in the April 2015 Draft EIR. Some commenters requested that emissions generated during periodic maintenance of the subsurface slant wells be included in the operational emissions. Subsequent to the release of the April 2015 Draft, the layout for the seawater intake system at the CEMEX active mining area was modified such that the well heads, valves, and other slant well facilities are now aboveground and readily accessible for maintenance, thereby reducing the disturbance activities and related GHG emissions associated with periodic maintenance. See Impact 4.11-1 for a quantification of GHG emissions associated with project operations, including emissions from slant well maintenance. Other commenters questioned the efficacy of the mitigation measures that were identified to reduce GHG emissions and suggested that CalAm be required to purchase offsets from the State's cap-and-trade program to lower the project's emissions to less than significant and comments were received requesting that CO_2 degassing from intake water to the atmosphere be analyzed. These issues are addressed under Impact 4.11-1.

As a result of comments received on the January 2017 Draft EIR/EIS, revisions have been made to this EIR/EIS section and include:

- *Revision of Mitigation Measure 4.11-1 to require net zero indirect emissions from electricity use during operation (reducing the significance of all impacts related to greenhouse gas emissions from significant and unavoidable to less than significant with mitigation).*

4.11.1 Setting/Affected Environment

The study area for impacts related to GHGs is the state of California.

4.11.1.1 Climate Change

Overview

There is scientific consensus that climate change is occurring and that human activity contributes in some measure (perhaps substantially) to that change. Gases that trap heat in the atmosphere are often called GHGs. Emissions of GHGs, if not sufficiently curtailed, are likely to contribute further to increases in global temperatures. The potential effects of climate change in California include sea level rise and reductions in snowpack, as well as an increased number of extreme-heat days per year, high ozone days, large forest fires, and drought years (CARB, 2009). Globally, climate change could affect numerous environmental resources through potential, though uncertain, changes in future air temperatures and precipitation patterns. According to the International Panel on Climate Change (IPCC), the projected effects of climate change are likely to vary regionally, but are expected to include the following direct effects (IPCC, 2007):

- Higher maximum temperatures and more hot days over nearly all land areas;
- Higher minimum temperatures (fewer cold days and frost days over nearly all land areas);
- Reduced diurnal temperature range over most land areas;
- Increase in heat index over most land areas; and
- More intense precipitation events.

In addition, many secondary effects are projected to result from climate change, including a global rise in sea level, ocean acidification, impacts on agriculture, changes in disease vectors, and changes in habitat and biodiversity. The possible outcomes and feedback mechanisms involved are not fully understood, and much research remains to be done; however, over the long term, the potential exists for substantial environmental, social, and economic consequences. Secondary effects of climate change with the most potential to affect the project area include sea level rise and ocean acidification. For discussion of effects related to climate change-induced sea level rise, refer to the *Coastal Flooding and Sea Level Rise* discussion in Section 4.3.1.4. See below for discussion of climate change-induced ocean acidification.

Ocean Acidification

Atmospheric CO_2 has risen by about 40 percent above pre-industrial levels. The ocean absorbs about a quarter of human-caused emissions of CO_2 annually, which is changing seawater chemistry and decreasing pH, making seawater more acidic. Surface ocean pH has declined by 0.1 units, equivalent to a 30 percent increase in ocean acidity, since pre-industrial times. Ocean acidification will continue in the future due to the interaction of atmospheric CO_2 and ocean water. Regional differences in ocean pH occur as a result of variability in regional or local conditions, such as upwelling that brings subsurface waters up to the surface. Locally, coastal waters and estuaries can also exhibit acidification as the result of pollution and excess nutrient inputs (GCRP, 2014).

More acidic waters disrupt the marine food chain. For example, calcium carbonate is a skeletal component of a wide variety of organisms in the oceans, including corals. The chemical changes caused by the uptake of CO_2 make it more difficult for these living things to form and maintain calcium carbonate shells and skeletal components and increases erosion of coral reefs, resulting in alterations in marine ecosystems that will become more severe as present-day trends in acidification continue or accelerate (GCRP, 2014). It should be noted that ocean acidification has little effect on the operations of desalination plants since the reverse osmosis process is not affected by pH.

4.11.1.2 Greenhouse Gas Emissions

GHG emissions that result from human activities primarily include carbon dioxide (CO_2), with much smaller amounts of nitrous oxide (N_2O), methane (CH_4, often from unburned natural gas), sulfur hexafluoride (SF_6) from high-voltage power equipment, and hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) from refrigeration/chiller equipment. Because these GHGs have different warming potentials (i.e., the amount of heat trapped in the atmosphere by a certain mass of the gas), and CO_2 is the most common reference gas for climate change, GHG emissions are often quantified and reported as CO_2-equivalent (CO_2e) emissions. For example, while SF_6 represents a small fraction of the total annual GHGs emitted worldwide, this gas is very potent, with 22,800 times the global warming potential of CO_2. Therefore, an emission of 1 metric ton of SF_6 would be reported as 22,800 metric tons CO_2e. The global warming potential of CH_4 and N_2O are 25 times and 298 times that of CO_2, respectively (CARB, 2016a). The principal GHGs resulting from human activity that enter and accumulate in the atmosphere are described below.

Carbon Dioxide

CO_2 is a naturally occurring gas that enters the atmosphere through natural as well as anthropogenic (human) sources. Key anthropogenic sources include the burning of fossil fuels (e.g., oil, natural gas, and coal), solid waste, trees, wood products, and other biomass, as well as industrially relevant chemical reactions such as those associated with manufacturing cement. CO_2 is removed from the atmosphere when it is absorbed by plants as part of the biological carbon cycle.

Methane

Like CO_2, CH_4 is emitted from both natural and anthropogenic sources. Key anthropogenic sources of CH_4 include gaseous emissions from landfills, releases associated with mining and materials extraction industries (in particular coal mining), and fugitive releases associated with the extraction and transport of natural gas and crude oil. CH_4 emissions also result from livestock and agricultural practices. Small quantities of CH_4 are released during fossil fuel combustion.

Nitrous Oxide

N_2O is also emitted from both natural and anthropogenic sources. Important anthropogenic sources include industrial activities, agricultural activities (primarily the application of nitrogen fertilizer), the use of explosives, combustion of fossil fuels, and decay of solid waste.

Fluorinated Gases

HFCs, PFCs, and SF_6 are synthetic gases emitted from a variety of industrial processes, and they contribute substantially more to the greenhouse effect on a pound for pound basis than the GHGs described previously. Fluorinated gases are often used as substitutes for ozone-depleting substances (i.e., chlorofluorocarbons, hydrochlorofluorocarbons, and halons). These gases are typically emitted in small quantities, but because of their potency they are sometimes referred to as “high global warming potential gases.” Fluorinated gases would not be emitted by any of the proposed construction or operational equipment that would be associated with the proposed project.

4.11.1.3 Greenhouse Gas Sources

Anthropogenic GHG emissions in the United States are derived mostly from the combustion of fossil fuels for transportation and power production. Energy-related CO_2 emissions resulting from fossil fuel exploration and use account for approximately three-quarters of the human-generated GHG emissions in the United States, primarily in the form of CO_2 emissions from burning fossil fuels. More than half of the energy-related emissions come from large stationary sources, such as power plants; approximately one-third derive from transportation; and a majority of the remaining sources include: industrial processes, agriculture, commercial, and residential (USEPA, 2016a).

Statewide emissions of GHG from relevant source categories for 2008 through 2014 are summarized in **Table 4.11-1**. Specific contributions from individual air basins, such as the North Central Coast Air Basin (Air Basin), which encompasses the project area, are included in the emissions inventory but are not itemized by air basin. In 2014, California produced 441.5 million gross metric tons of CO_2e emissions. Transportation was the source of 37 percent of the state’s GHG emissions, followed by industrial at 24 percent, electricity generation at 20 percent, commercial and residential sources at 11 percent, and agriculture and forestry comprised the remaining 8 percent (CARB, 2016b). Although not included as an emission inventory category, water use requires significant amounts of energy. Approximately one-fifth of the electricity and one-third of the non-power plant natural gas consumed in the state are associated with water delivery, treatment, and use.

Existing Greenhouse Gas Emissions at the Project Site

No industrial, residential, or other emitters of GHGs currently are located or operating at the MPWSP Desalination Plant site, slant wells site, Carmel Valley Pump Station site, or ASR injection well sites. There are no other existing onsite operations that result in the combustion of fossil fuel, or otherwise result in direct anthropogenic emissions of GHGs at the project sites. There is, however, existing grassland or scrub type vegetation located at these project sites that provide ongoing natural carbon uptake. The natural carbon uptake expressed in CO_2 associated with grassland and scrub vegetation types are 4.3 metric tons and 14.3 metric tons of CO_2 per acre-year, respectively (CAPCOA, 2013). These rates of carbon uptake were calculated by multiplying total biomass (metric tons dry matter per acre) from IPCC data by the carbon fraction in plant material (i.e., 0.47), then using the ratio of molecular weights (44/12) to convert from metric tons of carbon to metric tons of CO_2.

TABLE 4.11-1
CALIFORNIA GHG EMISSIONS (million metric tons CO_2E)

Emission Inventory Category	2008	2009	2010	2011	2012	2013	2014	
Transportation	176.17	169.51	166.20	162.90	162.94	161.46	163.02	37%
Electricity Generation (In State)	54.50	53.51	46.92	41.36	51.18	49.60	51.81	12%
Electricity Generation (Imports)	65.92	48.13	43.67	46.94	44.15	40.24	36.56	8%
Commercial	17.74	18.74	20.20	20.85	21.11	21.64	21.63	5%
Industrial	99.31	97.26	100.88	100.76	101.09	103.76	104.22	24%
Residential	30.55	30.33	31.43	32.25	30.30	31.47	27.40	6%
Agriculture and Forestry	36.37	34.06	34.92	35.85	36.78	35.36	36.11	8%
Not Specified (Solvents & Chemicals)	0.85	0.79	0.82	0.79	0.78	0.79	0.79	0%
Total Gross Emissions	**481.4**	**452.3**	**445.0**	**441.7**	**448.3**	**444.3**	**441.5**	100%

NOTE: The GHG percentages of the total gross emissions for year 2014 were rounded to the nearest whole number.

SOURCE: CARB, 2016b.

4.11.2 Regulatory Framework

This section provides an overview of federal, state, and local environmental laws, policies, plans, and regulations relevant to GHGs. A summary of each is provided, along with a finding regarding the proposed project's consistency with those regulatory requirements. The consistency findings concern the proposed project without mitigation. Where the proposed project would be consistent with the applicable regulatory requirement, no further discussion of project consistency with that regulatory requirement is provided. Where the proposed project would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to a specific impact discussion in Section 4.11.5, Direct and Indirect Effects of the Proposed Project, below, where the potential inconsistency is discussed in more detail.

4.11.2.1 Federal Regulations

Clean Air Act

On April 2, 2007, in *Massachusetts v. USEPA* (549 US 497), the Supreme Court found that GHGs are air pollutants covered by the Clean Air Act. The Court held that the USEPA must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making such decisions, the USEPA is required to follow the language of Section 202(a) of the Clean Air Act, which obligates it to prescribe (and from time to time revise) standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines. The Supreme Court decision resulted from a petition for rulemaking under Section 202(a) filed by more than a dozen environmental, renewable energy and other organizations.

On April 17, 2009, the USEPA Administrator signed proposed "endangerment" and "cause or contribute" findings for GHGs under Section 202(a) of the Clean Air Act. The USEPA found that six GHGs, taken in combination, endanger both the public health and the public welfare of current and future generations. The USEPA also found that the combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the greenhouse effect as air pollution that endangers public health and welfare under Clean Air Act Section 202(a). Pursuant to 40 CFR Part 52, *Proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule*, USEPA has mandated that Prevention of Significant Deterioration (PSD) and Title V requirements apply to facilities whose stationary source CO_2e emissions exceed 100,000 tons per year (USEPA, 2016b). The proposed project would not trigger PSD or Title V permitting under this regulation because it would generate less than 100,000 tons of CO_2e emissions per year.

U.S. Supreme Court Decision in Utility Air Regulatory Group v. USEPA

On June 23, 2014, the U.S. Supreme Court held that USEPA may not treat GHG emissions as an air pollutant for purposes of determining whether a source is a major source required to obtain a PSD or Title V permit. The Court also held that PSD permits that are otherwise required (based on emissions of other pollutants) may continue to require limitations on GHG emissions based on the application of Best Available Control Technology (BACT). In accordance with the Supreme Court decision, on April 10, 2015, the D.C. Circuit issued an amended judgment in *Coalition for Responsible Regulation, Inc. v. U.S. Environmental Protection Agency*, which vacated the PSD and Title V regulations under review in that case to the extent that they require a stationary source to obtain a PSD or Title V permit solely because the source emits or has the potential to emit GHGs above the applicable major source thresholds. The D.C. Circuit also directed USEPA to consider whether any further revisions to its regulations are appropriate, and if so, to undertake to make such revisions. In response to the Supreme Court decision and the D.C. Circuit's amended judgment, the USEPA intends to conduct future rulemaking action to make appropriate revisions to the PSD and operating permit rules (USEPA, 2016b).

4.11.2.2 State Regulations

A variety of statewide rules and regulations mandate the quantification and, if emissions exceed established thresholds, the reduction of GHGs. CEQA requires Lead Agencies to evaluate project-related GHG emissions and the potential for projects to contribute to climate change and to provide appropriate mitigation in cases where the Lead Agency determines that a project would result in a significant addition of GHGs to the atmosphere.

Executive Order S-3-05

In June 2006, Governor Arnold Schwarzenegger signed Executive Order S-3-05, which established the following statewide emission-reduction targets through the year 2050:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

This executive order does not contain any requirements that directly pertain to the proposed project; however, future actions taken by the State of California to implement these goals may affect the proposed project, depending on the specific implementation measures that are developed.

Assembly Bill 32

California Assembly Bill (AB) 32, *the Global Warming Solutions Act of 2006*, required the California Air Resources Board (CARB) to establish a statewide GHG emissions cap for 2020 based on 1990 emission levels. AB 32 required CARB to adopt regulations that identify and require selected sectors or categories of emitters of GHGs to report and verify their statewide GHG emissions, and CARB is authorized to enforce compliance with the program. Under AB 32, CARB also was required to adopt a statewide GHG emissions limit equivalent to the statewide GHG emissions levels in 1990, which must be achieved by 2020. CARB established this limit in December 2007 at 427 million metric tons of CO_2e. This is approximately 30 percent below forecasted “business-as-usual” emissions of 596 million metric tons of CO_2e in 2020, and about 10 percent below average annual GHG emissions during the period of 2002 through 2004 (CARB, 2009). In the interest of achieving the maximum technologically feasible and cost-effective GHG emission reductions, AB 32 permits the use of market-based compliance mechanisms and requires CARB to monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism that it adopts.

Climate Change Scoping Plan (AB 32 Scoping Plan)

In December 2008, CARB approved the AB 32 Scoping Plan outlining the State’s strategy to achieve the 2020 GHG emissions limit. The Scoping Plan estimates a reduction of 174 million metric tons CO_2e (about 191 million tons) from the transportation, energy, agriculture, forestry, and high climate-change-potential sectors, and proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify California’s energy sources, save energy, create new jobs, and enhance public health. The Scoping Plan must be updated every five years to evaluate the mix of AB 32 policies to ensure that California is on track to achieve the 2020 GHG reduction goal. Appendices C and E of the adopted 2008 AB 32 Scoping Plan include a list of 39 recommended action measures to reduce GHG emissions (CARB, 2009). Of the action measures, *W-3: Water System Energy Efficiency,* is the only measure that is directly applicable to the proposed project. The purpose of this measure is to reduce the magnitude and intensity of energy use in California’s water systems through implementation of energy-efficient production, treatment, and conveyance infrastructure. CARB has set a 20 percent electricity use reduction target from 2006 levels for this measure. The CPUC cannot substantiate that the proposed project’s electricity use would be reduced by 20 percent; therefore, the MPWSP would be potentially inconsistent with Measure W-3. This issue is addressed in Impact 4.11-3.

The AB 32 Scoping Plan must be updated every five years to evaluate the adopted mix of AB 32 policies to ensure that California is on track to achieve the 2020 GHG reduction goal. CARB released its first Scoping Plan Update in May 2014 (CARB, 2014). There are no recommended actions identified in the Scoping Plan Update that are directly applicable to the proposed project.

Mandatory Reporting Requirements

Pursuant to California Code of Regulations Title 17, Sections 95100 through 95158, operations of large industrial stationary combustion and process emissions sources that emit 10,000 metric tons CO_2e or more per calendar year are required to report and verify their GHG emissions to CARB. As indicated in **Table 4.11-5** under Impact 4.11-1, below, the total amortized GHG emissions for the proposed project would be 7,638 metric tons per year, which is below the AB 32 reporting threshold; therefore, the proposed project would not be subject to the AB 32 mandatory reporting requirements. In addition, many of the proposed project's sources of GHG emissions are not directly subject to CARB's reporting program because they are non-stationary sources, or are indirect emissions from electricity generating facilities which separately are subject to this program.

Market-Based "Cap-and-Trade" Compliance Mechanism

AB 32 allows the use of market-based compliance mechanisms to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 also requires CARB to monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism that it adopts. In response, CARB adopted a cap-and-trade program that covers major sources of GHG emissions such as refineries and power plants. The program includes an annual emissions cap that declines over time. CARB's cap-and-trade program applies to facilities that would emit 25,000 metric tons or more of CO_2e per year. Since the total amortized GHG emissions for the proposed project are estimated at 7,638 metric tons per year, the cap-and-trade program would not apply to the proposed project (see Section 4.11.5 for a discussion and breakdown of the construction-related and operational GHG emissions associated with the proposed project). The fossil fuel power plants that would generate the electricity that could be used by the project are already subject to and participate in CARB's cap-and-trade program.

Senate Bill 97

In 2007, the California State Legislature passed SB 97, which required amendment of the CEQA Guidelines to incorporate analysis of, and mitigation for, GHG emissions from projects subject to CEQA. The amendments took effect March 18, 2010. The amendments added Section 15064.4 to the CEQA Guidelines, specifically addressing the potential significance of GHG emissions. Section 15064.4 calls for a "good faith effort" to "describe, calculate or estimate" GHG emissions and indicates that the analysis of the significance of any GHG impacts should include consideration of the extent to which the project would:

- Increase or reduce GHG emissions;
- Exceed a locally applicable threshold of significance; or
- Comply with "regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions."

The CEQA Guidelines also state that a project may be found to have a less-than-significant impact related to GHG emissions if it complies with an adopted plan that includes specific measures to sufficiently reduce GHG emissions (14 Cal. Code Regs. §15064(h)(3)). Importantly, however, the CEQA Guidelines do not require or recommend a specific analytical methodology or provide quantitative criteria for determining the significance of GHG emissions.

Executive Order B-30-15

In April 2015, Governor Edmund G. Brown Jr. issued an executive order to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. Reaching this emission reduction target will make it possible for California to reach its ultimate goal of reducing emissions 80 percent under 1990 levels by 2050, as identified in Executive Order S-3-05. Executive Order B-30-15 also specifically addresses the need for climate adaptation and directs state government to:

- Incorporate climate change impacts into the State's Five-Year Infrastructure Plan;
- Update the Safeguarding California Plan, the state climate adaption strategy to identify how climate change will affect California infrastructure and industry and what actions the state can take to reduce the risks posed by climate change;
- Factor climate change into state agencies' planning and investment decisions; and
- Implement measures under existing agency and departmental authority to reduce GHG emissions (OGB, 2015).

Executive Order B-30-15 requires CARB to update the AB 32 Climate Change Scoping Plan to incorporate the 2030 target. The 2030 Draft Scoping Plan (Draft Scoping Plan) will serve as the framework to define the State's climate change priorities for the next 15 years and beyond. In June 2016, CARB released the 2030 Target Scoping Plan Update Concept Paper to describe potential policy concepts to achieve the 2030 target that can be incorporated in the Draft Scoping Plan. The concept paper presents four potential high-level concepts for achieving the needed GHG reductions (CARB, 2016c). The MPWSP would be potentially inconsistent with Executive Order B-30-15's GHG emissions goal because it would generate direct and indirect emissions of GHG emissions that could have a significant impact on the environment. This issue is addressed in Impacts 4.11-1 and 4.11-2.

4.11.2.3 Applicable Regional and Local Land Use Plans and Policies

As described above, the AB 32 Scoping Plan outlines the State's overall strategy to achieve the 2020 GHG emissions limit. Although state, regional, and local land use plans, policies, and regulations generally do not address GHG emissions at the project level, numerous state, regional, and local agencies with jurisdiction over the proposed project have adopted plans, policies, and regulations related to air quality and energy consumption that also have the effect of reducing GHG emissions. Project consistency with such plans, policies, and regulations is analyzed in Sections 4.10, Air Quality, and 4.18, Energy Conservation, of this EIR/EIS.

4.11.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to GHG emissions if it would:

- Generate GHG emissions, either directly or indirectly, that could have a significant impact on the environment; or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

The GHG analysis in this EIR/EIS relies on significance criteria identified by staff of the local air pollution control district, Monterey Bay Unified Air Pollution Control District (MBUAPCD). In February 2014, the MBUAPCD staff recommended that its Board of Directors approve an operational significance threshold of 10,000 metric tons CO_2e per year for stationary source projects that rely on operational processes and equipment that are subject to MBUAPCD permitting requirements. For land use projects, the MBUAPCD staff recommended to its board in February 2014 that it adopt the following options (i.e., if adopted, land use projects would be required to apply one of these options to demonstrate a less-than-significant impact): (a) a "bright line" significance threshold of 2,000 metric tons CO_2e per year; (b) incorporate mitigation measures to reduce all project GHG emissions by 16 percent compared to unmitigated emissions; or (c) or demonstrate compliance with an applicable adopted GHG reduction plan/climate action plan (MBUAPCD, 2014). In February 2016, the MBUAPCD adopted the staff-recommended significance threshold of 10,000 metric tons for stationary source projects (MBUAPCD, 2016a). As of June 2016, the MBUAPCD Board of Directors has not adopted any of the thresholds recommended by its staff for land use projects (MBUAPCD, 2016b). However, for the reasons set forth below, this EIR/EIS nonetheless uses the significance threshold of 2,000 metric tons CO_2e per year to evaluate whether the proposed project's emissions could have a significant impact on the environment.

For land use projects, the MBUAPCD staff-recommended bright line significance threshold is 2,000 metric tons CO_2e per year, which is based on a similar threshold that has been developed for Ventura County and represents an "emissions capture rate" of 75 percent of all commercial and residential land use development projects in Ventura County.[1] This recommended threshold is based on emissions data suggesting that commercial and residential projects that emit greater than 2,000 metric tons CO_2e per year are responsible for 75 percent of GHG emissions associated with those land uses. Therefore, use of this threshold effectively requires mitigation for the top 75 percent of emissions generated by new land use projects. If all land use-project emissions are mitigated to below this threshold, it would represent an overall reduction in new land use project-related emissions of up to 75 percent. Since the issuance of Executive Order B-30-15, the GHG emissions reductions goal of lowering GHG emissions to 40 percent below 1990 levels by 2030, is roughly equivalent to reducing emissions by 44 percent below current levels. This analysis uses

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1 A "75 percent emissions capture rate" means that 75 percent of the total emissions from all new projects would be subject to analysis in an environmental impact report prepared pursuant to CEQA, including analysis of feasible alternatives and imposition of feasible mitigation measures.

the staff-recommended bright line threshold to determine if the proposed project would generally be consistent with this goal.

It is acknowledged that the 2,000 metric ton significance threshold focuses on new commercial and residential development rather than industrial uses; however, similar to the emissions that would be associated with the proposed project, GHG emissions associated with commercial and residential development projects tend to be indirect in nature, primarily as a result of automobile and electricity use. This significance threshold falls short of meeting the Executive Order S-3-05 emissions reduction goal of lowering emissions to 80 percent below 1990 levels by 2050, which is equivalent to lowering emissions to 84 percent below current levels. The MBUAPCD staff and CARB have not yet provided guidance or recommendations for significance thresholds to evaluate consistency with the 2050 emissions reduction goal.[2]

MBUAPCD staff has not identified a specific significance threshold for short-term construction-related GHG emissions. Therefore, GHG emissions from MPWSP construction and periodic slant well maintenance are evaluated based on guidance developed by the San Luis Obispo County Air Pollution Control District (SLOCAPCD). For construction-related GHGs, SLOCAPCD recommends that total emissions from construction be amortized over a period equal to the estimated life of the project (in this case 40 years) and added to operational emissions, and then compared to the operational significance threshold (SLOCAPCD, 2012).

4.11.4 Approach to Analysis

The following discussions provide an overview of the approach to analysis for GHG emissions impacts. The assumptions used to estimate construction and operational GHG emissions are provided in **Appendix G1**.

4.11.4.1 Construction Emissions

Assumptions regarding construction equipment, equipment horsepower (hp) ratings, and construction phasing were developed by the CPUC and the Sanctuary in coordination with CalAm to populate the off-road equipment GHG emissions model used in this analysis. For off-road equipment, emissions were estimated using the California Emissions Estimator Model version 2013.2.2 (CalEEMod v2013.2.2). It is assumed that each piece of equipment associated with construction of the proposed MPWSP Desalination Plant would operate for up to 12 hours per day, the drill rigs for installation of the subsurface slant wells and ASR-5 and ASR-6 Wells would operate for up to 24 hours per day, the other equipment required to construct the slant wells and associated facilities would operate for up to 12 hours per day, and construction

2 On July 13, 2017, the California Supreme Court issued its opinion, reversing and remanding the 4th District Court of Appeals prior decision, in *Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497. There, the Supreme court held that the greenhouse gas analysis in the EIR SANDAG prepared for its SB 375 regional transportation plan was not required to “explicitly engage in an analysis of the consistency of the projected 2050 emissions” with the 80 percent reduction goal called for in Executive Order No. S-3-05, and in dicta, advised lead agencies to ensure that CEQA analysis discloses long-term greenhouse gas emissions, and “stays in step with evolving scientific knowledge and state regulatory schemes.”

equipment associated with all other project components (e.g., pipelines, and pump stations) would operate up to 8 hours per day.

GHG emissions from project-related on-road construction vehicles were estimated using CARB's most recent version of its motor vehicle emissions burden model (EMFAC2014). Since the EMFAC2014 model provides GHG emissions factors for CO_2 only, N_2O emission factors for gasoline and diesel combustion were obtained from The Climate Registry (TCR, 2016). GHG emissions in the form of CO_2e were calculated by multiplying the estimated total miles that would be traveled by construction worker vehicles and haul trucks by the GHG emission factors, multiplying the N_2O and CH_4 emissions by their respective global warming potential, and adding the CO_2, N_2O, and CH_4 emissions. Consistent with the SLOCAPCD's recommended approach for construction emissions, this analysis amortizes the proposed project's construction emissions over a 40-year project lifetime and adds them to the proposed project's estimated annual operational emissions, and then compares the total combined emissions to the 2,000 metric tons CO_2e per year significance threshold.

4.11.4.2 Operational Emissions

Indirect Emissions

The existing power demand needed to produce, treat, and convey water supplies for the Monterey District Service area used in this analysis is based on the average annual actual energy used in 2011, 2012, 2013, and 2015, multiplied by the 10-year average (2006 through 2015) of water production. Existing operational power demand is approximately 11,466 megawatt-hours (MWh) per year (CalAm, 2016). This amount represents the baseline electrical demand for this analysis.

The indirect emissions associated with the proposed project's electricity use were estimated using Pacific Gas and Electric Company's (PG&E) power grid emission factor for year 2020 [i.e., 290 pounds CO_2 per MWh; PG&E, 2015], which would be the first year the project would be operational. N_2O and CH_4 emission factors for electricity use were obtained from TCR (2016). CalAm initially estimated that the proposed project's annual electricity demand would be approximately 63,164 MWh per year (CalAm, 2016); and subsequent adjustments in the project description increased this estimate to 63,364 MWh per year. Therefore, the net increase in electrical power demand as of 2020 would be approximately 51,898 MWh per year. GHG emissions were estimated for CO_2, N_2O, and CH_4, the total CO_2e associated with project power demand was calculated by multiplying the N_2O and CH_4 emissions by their respective global warming potential, and then those values were added to the CO_2 emissions.

Exhaust Emissions

GHG emissions would also be generated from project-related vehicle travel during project operations and maintenance, from emergency generator testing at the MPWSP Desalination Plant, Monterey Pump Station, and Carmel Valley Pump Station, and off-road equipment use associated with periodic maintenance of the subsurface slant wells. GHG emissions from vehicles that would be used during project operations and maintenance were estimated using the same methodology described above for construction-related vehicle emissions. Emissions associated with up to

30 commuting workers each day and up to 3 material deliveries per day were calculated using EMFAC2014 emissions factors for light-duty trucks and heavy-duty diesel trucks, and multiplied by the respective estimated long-term vehicle miles per year for each vehicle type.

Routine operation of the emergency generators would be limited to 50 hours per year per generator for testing and maintenance. Fuel consumption factors for the emergency generators were obtained from manufacturer specifications of standby diesel generator sets similar to the size of the proposed emergency generators. GHG emissions associated with emergency generator testing were estimated by multiplying the total diesel fuel estimated to be consumed by CO_2, N_2O, and CH_4 emission factors obtained from TCR (TCR, 2016). N_2O and CH_4 emission values were multiplied by their respective global warming potentials and added to the CO_2 emissions to obtain CO_2e emissions.

For off-road equipment associated with maintenance of the slant wells that would be required every five years, GHG emissions were estimated using CalEEMod v2013.2.2. It was assumed that this maintenance would require four pieces of heavy-duty off-road equipment operating between six and eight hours per day in the CEMEX active mining area for periods ranging from 12 weeks to 18 weeks. Because this maintenance work would occur every five years, this analysis amortizes the slant well maintenance emissions over the five-year maintenance interval for comparison to the 2,000 metric ton significance threshold.

Brine Degassing Emissions

CO_2 degassing from groundwater to the atmosphere has been identified by a member of the public as a potential GHG emissions issue associated with the proposed project. Groundwater CO_2 partial pressures are typically 10 to 100 times higher than atmospheric CO_2 partial pressures. Therefore, when groundwater is extracted and brought to the surface, CO_2 degassing from the groundwater to the atmosphere occurs. To determine the amount of CO_2 degassing from subsurface water extraction that occurs when the groundwater equilibrates with the atmosphere, geochemical speciation modeling of the water would be required (Macpherson, 2009).

The GHG emissions analysis in this EIR/EIS includes consideration of the CO_2 that would be released from the discharged brine. The source water would be extracted from below the ocean floor using subsurface slant wells and conveyed to the desalination plant in an enclosed pipe. Therefore, the source water would behave like extracted groundwater, and degassing would occur when it would be brought to the surface if not treated. Approximately 43 percent of the water would pass through the seawater reverse osmosis system and become drinking water. The drinking water would be treated with lime to elevate the pH such that no CO_2 would be released. The remaining 57 percent would be discharged to the brine storage basin where it would temporarily be stored and have the opportunity to come to equilibrium with the atmosphere thereby releasing CO_2. To calculate the amount of CO_2 that could be released from source water during operation of the proposed project, Trussell Technologies (2016) used data from water quality samples drawn from the test slant well in June 2016 (see Appendix G2). The State Water Resources Control Board and the Central Coast Regional Water Quality Control Board have peer reviewed Trussell Technologies' analysis and the results of the Trussell Technologies analysis is included in this EIR/EIS.

Carbon Sequestration

The rate of existing carbon sequestration that occurs at the proposed project sites that would be permanently disturbed has been estimated under the assumption that the ongoing natural carbon uptake by vegetation and biological soil crusts associated with the general vegetation types of grassland and scrub are equivalent to 4.3 metric tons and 14.3 metric tons of CO_2 per acre, respectively (see Section 4.11.1.3, Greenhouse Gas Sources). The acreages of vegetation types that would be permanently disturbed by the proposed project or one of the action alternatives were obtained from Section 4.6, Terrestrial Biological Resources.

4.11.4.3 Evaluation of GHG Emissions

The proposed project would include three new emergency backup generators that would be operated intermittently. With the exception of these backup generators that would emit less than one half of one percent of the total annual project-related GHG emissions (see Table 4.11-4), the proposed project would include no other stationary sources of emissions that would require a MBUAPCD permit. Although the proposed project would be a heavy industrial land use type, it would primarily result in indirect emissions associated with use of electricity from PG&E's electrical grid by stationary sources at power plants. These sources are regulated and permitted by local air districts throughout California; however, they are outside of the control of CalAm and are not under the jurisdiction of the CPUC. Because the sources of the indirect emissions are already regulated and permitted by the local air districts where the power plants reside, no permit or other MBUAPCD approval would be required for the proposed project's demand for electricity. For this reason, the stationary source threshold of 10,000 metric tons CO_2e per year is not an appropriate threshold to gauge impact significance for the proposed project; use of one of the threshold options developed for land use projects, which do not require MBUAPCD permits for stationary sources, is more appropriate. While the 10,000 metric tons CO_2e per year significance threshold is not used, indirect emissions associated with electricity consumption are calculated and impacts are fully assessed in this chapter.

As mentioned above and elaborated in the discussion of Impact 4.11-1, below, the vast majority of GHG emissions associated with the proposed project would be indirect emissions related to the project's use of electricity from PG&E's electrical power grid. The estimated future average annual energy use for the proposed project is based on aggregate energy use factors for the existing and proposed production facilities and the volume of desalinated product water that would be produced from each. The energy requirements for desalination depend on several factors, including source water, RO membrane properties, and pre- and post-treatment requirements. However, based on the information currently available for the proposed project, it is not possible to quantify with reasonable certainty whether or not the proposed project emissions can be reduced by 16 percent (even with implementation of mitigation discussed in the analysis, below), as recommended by MBUAPCD staff as one of the options to demonstrate a less-than-significant impact, as described above in Section 4.11.3. In addition, there is no existing local or regional GHG reduction plan/climate action plan that would be applicable to the proposed project, such that compliance with an applicable adopted GHG reduction plan/climate action plan could be demonstrated for this project. Therefore, neither the mitigated 16-percent reduction in GHG emissions nor the compliance with an GHG reduction plan/climate action plan thresholds for assessment of land use projects are considered practicable for evaluation of the proposed project.

4.11.5 Direct and Indirect Effects of the Proposed Project

Table 4.11-2 summarizes the proposed project's GHG-related impacts and significance determinations.

TABLE 4.11-2
SUMMARY OF IMPACTS – GHG EMISSIONS

Impacts	Significance Determinations
Impact 4.11-1: Incremental contribution to climate change from GHG emissions associated with the proposed project.	LSM
Impact 4.11-2: Conflict with the Executive Order B-30-15 Emissions Reduction Goal.	LSM
Impact 4.11-3: Conflict with AB 32 Climate Change Scoping Plan.	LSM
Impact 4.11-C: Cumulative impacts related to greenhouse gas emissions	LSM

NOTE:
LSM = Less than Significant with implementation of mitigation.

Impact 4.11-1: Incremental contribution to climate change from GHG emissions associated with the proposed project. (*Less than Significant with implementation of mitigation*)

Implementation of the proposed project would result in short-term construction and long-term operational emissions. Construction and operation emissions that would be associated with the proposed project are discussed separately below; however, the impact conclusion is based on the sum of amortized construction emissions and the operational emissions (see Section 4.11.4, Approach to Analysis, for additional information regarding the methods used to estimate the proposed project's short-term construction and long-term operation emissions). In the Draft EIR/EIS, Impact 4.11-1 was deemed Significant and Unavoidable due to the lack of available information to quantify the reductions from the proposed mitigation measures. Since publication, the project proponent has committed to a detailed GHG emissions reduction plan that enables quantification of GHG reductions with sufficient certainty. This determination, due to the adoption of the revised mitigation measures described below, has been changed to less than significant with implementation of mitigation. This change reflects a decrease in anticipated impacts, adopts measures previously discussed in the Draft EIR/EIS, and reflects a commitment to mitigation measures in response to comments received during the public comment period.

Construction Emissions

As shown in **Table 4.11-3**, GHG emissions generated by construction of the proposed project would total approximately 14,291 metric tons CO_2e over the 24-month construction period, which equates to a 40-year amortized annual average value of approximately 357 metric tons CO_2e

(refer to Section 4.11.4.1, Construction Emissions, for details on the approach this analysis uses relative to short-term construction emissions; and **Appendix G1** for all assumptions associated with the GHG construction emissions).

TABLE 4.11-3
TOTAL GHG EMISSIONS FROM PROJECT CONSTRUCTION

Construction Emission Source	CO_2e
Desalination Plant	7,087.22
Subsurface Slant Wells	1,880.56
Source Water Pipeline	575.17
Brine Discharge Pipeline	198.02
Brine Mixing Box	594.06
Castroville Pipeline	271.09
Pipeline to CSIP	189.61
New Desalinated Water Pipeline	571.10
New Transmission Main	873.98
ASR Pipelines	472.24
ASR-5 and ASR-6 Wells	866.65
Carmel Valley Pump Station	249.65
Ryan Ranch-Bishop Interconnection Improvements	264.03
Main System-Hidden Hills Interconnection Improvements	198.02
Total Emissions	**14,291.41**
40-Year Amortized Annual Average	**357.29**

SOURCE: ESA, 2017. See **Appendix G1.**

Operational Emissions

The proposed project would generate long-term GHG emissions associated with electrical power consumption, vehicle travel, operation of diesel-fueled emergency generators, and off-road equipment use associated with periodic maintenance at the slant well sites. As described in Section 4.11.4.2, indirect emissions would result from a total project-related net increase in electricity demand of approximately 51,898 MWh per year. Other emission sources that would occur during operations of the proposed project would include up to 66 one-way vehicle trips per day associated with commuting workers and material deliveries, up to 50 hours per year of routine testing and maintenance of each of the two emergency generators at the MPWSP Desalination Plant site (1,000 hp) and at the Carmel Valley Pump Station (68 hp), off-road equipment that would be required every five years to maintain the slant wells, CO_2 degassing from discharged brine water, and loss of carbon sequestration due to permanent vegetation removal. The estimated annual emissions that would be associated with each of these operational sources are presented in **Table 4.11-4**. As indicated in the table, total net CO_2e emissions associated with operation of the proposed project would be approximately 8,008 metric tons per year.

TABLE 4.11-4
TOTAL GHG EMISSIONS FROM PROJECT OPERATIONS

Operation Emissions Source	Operational Emissions (total metric tons)			
	CO_2	N_2O	CH_4	CO_2e
Baseline Electricity Consumption	1,508.27	0.03	0.16	1,521.11
Electricity Consumption with Project	8,308.83	0.16	0.89	8,406.07
Net Increase in Electricity Consumption	6,800.56	0.13	0.73	6,884.96
Vehicle Trips	233.58	0.02	0.01	239.66
Emergency Generator Testing	24.86	<0.01	<0.01	25.09
Off-road Equipment for Slant Well Maintenance (amortized over 5 years)	14.81	<0.01	<0.01	14.86
Degassing from Discharged Brine Water*	735.00	---	---	735.00
Loss of Carbon Sequestration	107.98	---	---	107.98
Total	**7,916.79**	**0.15**	**0.74**	**8,007.54**

SOURCES: ESA, 2017. See **Appendix G1** and Trussell, 2016, **Appendix G2**.

As listed in **Table 4.11-4**, the vast majority of GHG emissions associated with long-term operation of the proposed project would be indirect emissions from the project's use of electricity, which would be provided by the local PG&E electrical power grid.

Due to California's Renewables Portfolio Standard (RPS) program that requires investor-owned utilities to increase procurement from eligible renewable energy sources to 33 percent of total procurement by 2020, PG&E has steadily increased the amount of renewables in its energy production portfolio, which lowers the overall indirect emissions associated with use of its electricity. The mix of sources of electricity that PG&E delivered to its customers in 2015 is described in Section 4.18.1.2 and Table 4.18-1. In fact, indirect emissions associated with use of PG&E's electricity will continue to drop as more and more electricity from renewable power generators is brought onto the grid. PG&E estimates that its emissions rate for its current (i.e., year 2016) energy production portfolio is 370 pounds of CO_2 per MWh generated, and that its emissions rate estimate for year 2020 is 290 pounds of CO_2 per MWh generated (PG&E, 2015). This will equal a reduction in indirect GHG emissions associated with electricity use in the PG&E service area of approximately 22 percent over the next four years. In addition, in October 2015, Governor Brown signed Senate Bill 350 which expanded the RPS program goal to 50 percent by 2030. As a result of this expansion, PG&E's electricity emissions rate (and thus the carbon footprint of the proposed project's electricity consumption) will continue to decrease throughout the life of the proposed project.

Consistency with Regulatory Requirements

As noted in Section 4.11.2, Regulatory Framework, the MPWSP would be potentially inconsistent with Executive Order B-30-15's GHG emissions goal because it would generate direct and indirect emissions of GHG emissions that could have a significant impact on the environment. As discussed in the following paragraphs of Impact 4.11-1 conclusions and under Impact 4.11-2, **Mitigation Measures 4.18-1 (Construction Equipment and Vehicle Efficiency Plan)** and **4.11-1 (GHG Emissions Reduction Plan)** would reduce the carbon footprint of the proposed project and the impact associated with GHG emissions would be reduced to less than significant.

Impact Conclusion

As shown in **Table 4.11-5**, the sum of the 40-year amortized construction GHG emissions and the total net operation emissions that would be associated with the proposed project is approximately 8,365 metric tons CO_2e per year. These emissions would exceed the 2,000 metric tons per year significance threshold; therefore, a significant impact would occur, and the proposed project would be considered to contribute to the primary and secondary adverse effects of climate change, such as increases in global temperatures, global rise in sea level, ocean acidification, impacts on agriculture, changes in disease vectors, and changes in habitat and biodiversity. Of these adverse effects, global rise in sea level would have the most potential to impact the project. See Impact 4.3-11, *Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise,* in Section 4.3.5.2, for a discussion of how global rise in sea level would affect the project.

TABLE 4.11-5
TOTAL AMORTIZED GHG EMISSIONS

Emissions Source	CO_2e (metric tons per year)
40-Year Amortized Construction Emissions	357
Total Net Operational Emissions	8,008
Total Project Emissions	**8,365**

SOURCE: ESA, 2017. See **Appendix G1**.

Implementation of **Mitigation Measure 4.18-1 (Construction Equipment and Vehicle Efficiency Plan)** would ensure that construction activities are conducted in a fuel-efficient manner (see Impact 4.18-1 in Section 4.18, Energy Conservation), which would also limit the generation of GHG construction-related emissions.

With regard to operation-related GHG emissions, the vast majority of emissions would be a result of increased electricity consumption. The MPWSP Desalination Plant is being designed with state of the art energy recovery and energy efficient features; however, additional energy-reducing features may be available to further reduce the electrical consumption associated with the proposed project. In addition, it would be feasible for CalAm to obtain “clean” renewable energy for operations of the proposed project, which would reduce the overall carbon footprint of the project. Therefore, implementation of **Mitigation Measure 4.11-1 (GHG Emissions Reduction Plan)** is required to reduce the overall carbon footprint of the proposed project.

Implementation of **Mitigation Measures 4.11-1** and **4.18-1** would ensure that the proposed project is constructed and operated in an energy-efficient manner and that the overall carbon footprint of the proposed project would be reduced to less than 2,000 metric tons CO_2e per year. The mitigated amortized project emissions would be approximately 1,480 metric tons CO_2e per year, representing the total unmitigated amortized GHG emissions of 8,365 metric tons CO_2e per year minus the mitigated net GHG increase related to annual electricity consumption of 6,885 metric tons CO_2e per year. Therefore, this impact would be mitigated to a less-than-significant level.[3]

CARB's cap-and-trade program applies to facilities that would emit 25,000 metric tons or more of CO_2e per year. As discussed above, the proposed project would primarily result in indirect emissions associated with electricity use from PG&E's power grid that would be substantially less than 25,000 metric tons CO_2e per year. MBUAPCD considers operations of any project that would be in accordance with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions [such as, sources subject to the Cap-and-Trade requirements pursuant to Title 17, Article 5 (California Cap on Greenhouse Gas Emissions and Market-based Compliance Mechanisms)] to be less than significant. The fossil fuel power plants that would generate the electricity that would be used by the project are already subject to and participate in CARB's cap-and-trade program. \

Mitigation Measures

Since the publication of the Draft EIR/EIS, the project proponent, CalAm, has committed to an updated *GHG Emissions Reductions Plan.*

Mitigation Measure 4.11-1 applies to the project as a whole.

Mitigation Measure 4.11-1: GHG Emissions Reductions Plan.

(a) ***Energy Conservation Technologies*.** CalAm shall have a qualified professional (a licensed mechanical engineer or other appropriately certified professional approved by the CPUC) prepare and submit a GHG Emissions Reduction Plan (Plan) to the CPUC for approval prior to the start of project construction activities. Once approved by the CPUC, the Plan shall be implemented. The Plan shall include a detailed description of the carbon footprint for all operational components of the approved project (e.g., slant well pumping, the MPWSP Desalination Plant, transmission of source and product water, ASR system) based on manufacturer energy usage specification data for each piece of equipment and the most current power system emissions factor for GHG emissions based on the energy portfolio of PG&E, the applicable Electric Service Provider under Direct Access service, or Monterey Bay Community Power and its successors and assigns, as applicable.

The Plan shall include a summary of state-of-the-art energy recovery and conservation technologies available for utility scale desalination facilities and shall include a commitment by CalAm to incorporate available feasible energy recovery and conservation technologies; or, if CalAm finds that any of the technologies will not be feasible for the project, the Plan shall clearly explain why such technology is considered to be infeasible. The carbon footprint estimate for the project shall include consideration of all proposed energy recovery and conservation technologies that will

[3] At the time of publication of the Draft EIR/EIS, it was not possible to substantiate numerically that the GHG emissions would be reduced to less than significant level. Since publication, a detailed mitigation strategy was developed that enabled quantification of reductions with sufficient certainty to support the determination of less than significant with mitigation.

be employed by the project, and shall describe the approximate GHG emissions reductions that will be associated with each technology.

(b) ***Renewable Energy.*** CalAm shall ensure that the approved project's operational electricity use results in net zero GHG emissions. In meeting this net zero GHG emissions requirement, subject to the procedures below, CalAm shall adhere to the following loading order:

(1) Obtain renewable energy from on-site solar photovoltaic (PV) panels and/or the adjacent Monterey Regional Waste Management District (MRWMD) landfill-gas-to-energy (LFGTE) facility.

(2) Procure renewable energy from off-site sources within California via purchases from one or more of the following: (a) PG&E, (b) an Electric Service Provider under Direct Access service, or (c) Monterey Bay Community Power and its successors and assigns.

(3) Procure and retire Renewable Energy Certificates (also known as RECs, green tags, Renewable Energy Credits, Renewable Electricity Certificates, or Tradable Renewable Certificates) for projects or activities in California.

(4) Procure and retire Carbon Offsets, in a quantity equal to the GHG emissions attributable to the project's operational electricity use. "Carbon Offset" means an instrument issued by an Approved Registry and shall represent the past reduction or sequestration of one metric ton of CO_2e achieved by any GHG emission reduction project or activity within California. "Approved Registry" means: (i) the Climate Action Reserve, the American Carbon Registry, the Verified Carbon Standard, or the Clean Development Mechanism; or (ii) any other entity approved by the California Air Resources Board to act as an "offset project registry" under the state's Cap-and-Trade Program.

CalAm may meet this net zero GHG emissions requirement via any of the options, or their future equivalents, or any combination of options, or their future equivalents, included in the aforementioned loading order.

Further, CalAm shall progress through the loading order on the basis of the options' physical and economic feasibility, as reasonably determined by CalAm, with low-cost options preferred over high-cost options. In the event that options have equivalent costs, options enumerated earlier in the loading order shall be selected by CalAm over options enumerated later in the loading order. On or before June 1 of each year the approved project is in operation, CalAm shall submit documentation to the CPUC demonstrating that the project's operational electricity use in the immediately preceding calendar year resulted in net zero GHG emissions. Calculation of the GHG emissions attributable to the project's operational electricity use (if any) shall be calculated by CalAm on an annual basis using the most up-to-date emissions coefficient for purchased electricity (if any), as compiled or published by PG&E, the applicable Electric Service Provider under Direct Access service, or Monterey Bay Community Power and its successors and assigns, as applicable. If the CPUC determines that CalAm failed to achieve net zero GHG emissions for the approved project's operational electricity use for a particular year, then the CPUC shall notify CalAm in writing of the exceedance within 45 days of receipt of the documentation submitted by CalAm under this mitigation measure. The notice shall specify the metric tons of GHG emissions that exceeded the net zero obligation. Within 45 days of receipt of this notice, CalAm shall procure and retire Carbon Offsets in an amount at least equivalent to the exceedance, and will submit documentation to the CPUC demonstrating this procurement and retirement.

Secondary Impacts of Mitigation Measure 4.11-1:

Potential secondary impacts associated with implementation of solar PV panels as proposed by Mitigation Measure 4.11-1 are discussed below.

- ***Aesthetics/Glare*:** The solar PV panels would potentially be installed on the rooftop or as parking space cover in the parking lot of the MPWSP Desalination Plant, and would therefore share the same aesthetic setting as described for the Desalination Plant in Section 4.14.2.3. This site is characterized as Urban/Built Up, with agriculture, industrial operations, and local roads in the vicinity. The aesthetic visual quality is low. Due to the height of the PV panel installation, passersby may infrequently experience glare from the panels or panel frames at further distances, for fleeting moments at certain times of the year. The impact would be less than significant.
- ***Surface water runoff*:** Since solar PV panels would be installed on the rooftop or parking lot of the MPWSP Desalination Plant, they would displace impervious surfaces already examined in Section 4.3, Surface Water and Hydrology, in Impacts 4.3-7 and 4.3-8 for the Desalination Plant facility, including the parking lot. Overall, the Desalination Plant facility siting would have a less-than-significant impact related to surface water runoff which could cause the alteration of drainage patterns; solar PV panels would not increase this impact.

Mitigation Measure 4.18-1 applies to all project components.

Mitigation Measure 4.18-1: Construction Equipment and Vehicle Efficiency Plan.

(See Impact 4.18-1 in Section 4.18, Energy Conservation, for description.)

Impact 4.11-2: Conflict with the Executive Order B-30-15 Emissions Reduction Goal. (*Less than Significant with implementation of Mitigation*)

All Proposed Project Facilities

As discussed under Impact 4.11-1, above, GHG emissions associated with the proposed project would exceed the emissions significance threshold, which indicates that implementation of the project would not be consistent with the GHG emission reduction goals for year 2030 identified in Executive Order B-30-15. Therefore, the proposed project would conflict with Executive Order B-30-15 and would result in a potentially significant impact.

Implementation of **Mitigation Measure 4.11-1 (GHG Emissions Reduction Plan)** described under Impact 4.11-1, above, and **Mitigation Measure 4.18-1 (Construction Equipment Efficiency Plan)** described under Impact 4.18-1 (see Section 4.18, Energy Conservation), respectively, would require CalAm to develop and implement a GHG Emissions Reduction Plan and a Construction Equipment Efficiency Plan, which would reduce project-related GHG emissions to below the GHG significance threshold. Therefore, this impact is considered to be less than significant with implementation of mitigation.

Mitigation Measures

Mitigation Measure 4.11-1 applies to the project as a whole.

Mitigation Measure 4.11-1: GHG Emissions Reduction Plan.

(See Impact 4.11-1, above, for description.)

Mitigation Measure 4.18-1 applies to all project components.

Mitigation Measure 4.18-1: Construction Equipment Efficiency Plan.

(See Impact 4.18-1 in Section 4.18, Energy Conservation, for description.)

Impact 4.11-3: Conflict with AB 32 Climate Change Scoping Plan. (*Less than Significant with implementation of mitigation*)

As identified in Section 4.11.2, Regulatory Framework, the only plan that would be directly applicable to the proposed project would be AB 32 Scoping Plan Measure W-3, Water System Energy Efficiency. CARB has set a 20 percent electricity use reduction target from 2006 levels for this measure. The intent of Measure W-3 is to compel water purveyors to: incorporate advanced technologies in the design and construction of water supply systems to lower energy consumption; examine opportunities to use energy sources that have lower GHG emissions; and identify new and innovative technologies and measures for mutually achieving energy and water efficiency savings. As described in Chapter 3, Description of the Project (Proposed Action), Section 3.2.2.2, Reverse Osmosis System, CalAm proposes to incorporate process and energy recovery systems that would utilize pressure-exchange technologies to transfer energy from the high-pressure brine stream to the source water stream to reduce energy demand as well as source water pumping requirements. The use of modern reverse osmosis technology would also ensure that the energy would be used efficiently. These recent technological advancements include less energy intensive membrane materials and more efficient pumps (Pacific Institute, 2013). In addition, the design and construction of the MPWSP Desalination Plant would incorporate various energy efficient design elements into building support systems, electrical and treatment equipment, and process design that would reduce operational energy demand (see Section 3.4.5 in Chapter 3, Description of the Proposed Project). These project elements would increase energy efficiency and reduce energy demand, thereby reducing indirect emissions of GHGs.

In addition to the proposed energy recovery system and use of energy efficient design elements, variable-frequency drives would be used where appropriate to reduce the operating speed of pumps to closely match the pump discharge pressure requirements, which would reduce energy usage (CDM Smith, 2014). Variable-frequency drives, which are electronic controllers that adjust the speed of an electric motor by modulating the power being delivered, provide continuous control, matching motor speed to the specific demands of the work being performed (CPUC, 2016). In addition, energy-efficient motors, also called premium or high-efficiency motors, would be used for project motors ranging in size from 5 to 800 hp. These motors are up to 8 percent more efficient than standard motors. Energy-efficient motors contain design improvements including, for example, lengthening the core and using lower-electrical-loss steel, thinner stator laminations, more copper in the windings to reduce electrical losses, improved bearings, and smaller, more aerodynamic cooling fans (CPUC, 2016). Also, the pipeline system materials and sizing that would be used for the proposed project would be designed to limit pressure losses and reduce pumping and energy demand requirements (CDM Smith, 2014).

Impact Conclusion

CARB has set a 20 percent electricity use reduction target for Measure W-3. The MPWSP Desalination Plant designs already include state of the art energy recovery and energy efficient features in place of standard energy saving systems; although there may be additional feasible energy reducing features available to further reduce the electrical consumption associated with the project. Therefore, implementation of **Mitigation Measure 4.11-1 (GHG Emissions Reduction Plan)** is required to ensure that the proposed project is operated in an energy-efficient manner to the extent feasible. Although the CPUC cannot substantiate that the proposed project's electricity use would be reduced by 20 percent, pursuant to implementation of Mitigation Measure 4.11-1, the electricity that would supply the project would be generated from renewable energy sources, and/or would otherwise be offset through the procurement of Renewable Energy Certificates and/or retirement of Carbon Offsets. Therefore, this impact is considered to be less than significant with implementation of mitigation.

Mitigation Measure

Mitigation Measure 4.11-1 applies to the project as a whole.

> **Mitigation Measure 4.11-1: GHG Emissions Reduction Plan.**
>
> (See Impact 4.11-1, above, for description.)

4.11.6 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects.

Impact 4.11-C: Cumulative impacts related to greenhouse gas emissions (*Less than Significant with implementation of mitigation*)

Because GHG emissions have global climate change implications, the evaluation of GHG emissions impacts is inherently a cumulative impact analysis. Through Executive Orders S-3-05 and B-30-15, as well as AB 32, the State has established goals and policies for reducing its contribution of GHG emissions. Accordingly, these policy documents provide goals against which the significance of individual projects' emissions can be measured. Consistent with the emissions reduction goal for 2030 identified in Executive Order B-30-15, the numeric significance criterion used to evaluate operational emissions plus construction emissions amortized over the project's estimated 40-year lifetime is 2,000 metric tons CO_2e per year. The analysis also considers the MPWSP's consistency with applicable AB 32 Scoping Plan Measure W-3. If MPWSP construction and operations would result in GHG emissions greater than 2,000 metric tons CO_2e per year, or conflict with AB 32 Scoping Plan Measures, the MPWSP would not be considered consistent with the State's GHG reduction goals and the associated impact would be cumulatively significant. The timeframe during which the MPWSP could contribute to cumulative GHG emissions effects includes the 24-month construction phase, as well as the anticipated approximately 40-year operations phase.

As discussed in Impact 4.11-1, the MPWSP construction activities would generate approximately 14,291 metric tons CO_2e over the 24-month construction period. Amortized over the project's estimated 40-year lifetime, annual average emissions would be approximately 357 metric tons CO_2e (refer to **Appendix G1** for all assumptions associated with the GHG construction emissions). The Impact 4.11-1 discussion also discloses that the MPWSP operations total net emissions would be approximately 8,008 metric tons CO_2e per year, which would result in a significant impact and a significant contribution to the overall significant cumulative impact associated with climate change. Thus, the combined amortized annual construction emissions and annual operations emissions would be approximately 8,365 metric tons CO_2e. **Mitigation Measure 4.11-1 (GHG Emissions Reduction Plan)** requires CalAm to prepare and implement a GHG Emissions Reduction Plan to address project emissions. The plan would identify specific technologies CalAm would implement to maximize energy efficiency and use of renewable energy technologies, and would be subject to CPUC review prior to the start of construction. In addition, CalAm would be required to implement **Mitigation Measure 4.18-1 (Construction Equipment Efficiency Plan)** to ensure project construction activities are conducted in a fuel-efficient manner, which would also limit the generation of GHG construction-related emissions.

Implementation of these measures would reduce the overall carbon footprint of the project to a less-than-significant level. Therefore, with mitigation, the project's incremental contribution to the cumulative climate change impact related to GHG emissions would be less than significant.

The intent of AB 32 Scoping Plan Measure W-3 (Water System Energy Efficiency) is to encourage GHG emissions reductions through the incorporation of energy saving technologies. As described in the Impact 4.11-3 discussion, CalAm has committed to implementing project features to ensure that the MPWSP would be operated in an energy efficient manner; although there may be additional feasible energy-reducing features available to further reduce the electrical consumption associated with the project. Therefore, implementation of Mitigation Measure 4.11-1 (GHG Emissions Reduction Plan) is required to ensure that the proposed project is operated in an energy-efficient manner to the extent feasible. CARB has set a 20 percent electricity use reduction target for Measure W-3. Although the CPUC cannot substantiate that the proposed project's electricity use would be reduced by 20 percent, pursuant to implementation of Mitigation Measure 4.11-1, the electricity that would supply the project would be generated from renewable energy sources, and/or would otherwise be offset through the procurement of Renewable Energy Certificates and/or retirement of Carbon Offsets. Therefore, the project's incremental contribution to the cumulative impact related to conflicts with the AB 32 Climate Change Scoping Plan would be less than significant with implementation of mitigation.

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4.12 Noise and Vibration

As a result of comments received on the January 2017 Draft EIR/EIS, revisions have been made to this EIR/EIS section. Those changes include:

- *Description of open window noise scenarios for sleep interference;*
- *Revision to Mitigation Measure 4.12-1a to specify noise complaint response and documentation system;*
- *Revision to Mitigation Measure 4.12-1d to ensure that barrier blankets sufficiently achieve performance standards; and,*
- *Revision to Mitigation Measure 4.12-1e to include temporarily hotel accommodations when nighttime construction noise would exceed 35 dBA with windows open.*

This section evaluates the potential noise and vibration impacts associated with construction and operation of the Monterey Peninsula Water Supply Project (MPWSP or proposed project). This section describes the existing noise environment and identifies nearby sensitive receptors, presents relevant local noise ordinances and standards, and evaluates the potential for the proposed project to result in noise and vibration impacts. This section focuses on noise and vibration impacts on humans and structures; potential noise and vibration effects on marine and terrestrial wildlife are addressed in Sections 4.5, Marine Biological Resources, and 4.6, Terrestrial Biological Resources, respectively.

4.12.1 Key Concepts and Terminology

4.12.1.1 Noise

Sound is mechanical energy transmitted by pressure waves through a medium such as air or water; the manner in which sound travels through this medium is influenced by the physical properties of the medium (such as temperature, density, and humidity). Noise is often defined as unwanted sound. Of the various noise descriptors used to characterize the loudness of a sound, the sound pressure level has become the most common.

The human ear is not equally sensitive to all frequencies on the audible sound spectrum; for this reason, human response is factored into sound descriptions in a process called “A-weighting,” expressed as “dBA.” The dBA, or A-weighted decibel, is a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA.

Sound can vary in intensity by over 1 million times within the range of human hearing; for this reason, the decibel scale is based on logarithms (a system used to shorten calculations in mathematics), which keeps sound pressure measurements within a convenient and manageable range. Because the decibel scale is logarithmic in nature, two noise sources do not combine in a simple additive fashion. For example, if two sources each produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA. The noise levels presented in this section are expressed in dBA, unless otherwise indicated.

Stationary noise sources such as idling vehicles or onsite construction equipment are considered “point sources,” and noise originating from these sources “attenuates,” or decreases, based on certain physical principles (e.g., spherical spreading[1]). In accordance with these principles, this analysis assumes that noise originating from a point source within 200 feet of a receiver attenuates at a rate of 6.0 dBA per doubling of distance, and noise from a point source greater than 200 feet away attenuates at a rate of 7.5 dBA per doubling of distance (Caltrans, 2009). Application of these attenuation rates account for such factors as the absorption of noise waves into ground surfaces, vegetation, and intervening structures.

Noise Exposure and Community Noise

The sound pressure level is a measure of noise experienced by an individual at a given moment, and noise exposure is a measure of noise experienced over a period of time. However, consistent noise levels rarely persist over a long period of time. In fact, community noise varies continuously with time and in relation to the contributing sources of sound within the noise environment. Community noise is primarily the product of many distant noise sources that combine to create a relatively stable background noise environment, and individual contributors

[1] Noise attenuates as sound waves spherically spread over hard and soft surfaces.

to the community noise level are generally unidentifiable. Background noise levels change throughout a typical day, but do so gradually, corresponding with the addition and subtraction of distant noise sources as well as changes in atmospheric conditions. The addition of short-duration, single-event noise sources (e.g., aircraft flyovers, motor vehicles, sirens) makes community noise constantly variable throughout a day.

To appropriately characterize the community noise environment and evaluate noise impacts, noise exposure must be measured over a period of time. This time-varying nature of environmental noise is characterized using statistical noise descriptors. In addition to dBA, the following noise descriptors are used in this evaluation:

dB — The decibel (dB) scale is used to quantify sound intensity, with 0 dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain.

dBA — A-weighted decibels (dBA) are measured using a filter that de-emphasizes the frequencies below 1,000 hertz (Hz) and above 5,000 Hz in a manner corresponding to the human ear’s decreased sensitivity to low and extremely high frequencies.

L_{eq} — The energy-equivalent sound level (L_{eq}) provides a single numerical value for noise measured over a specified period of time. The L_{eq} is the average noise exposure level for the given time period.

L_{max} — The instantaneous maximum noise level (L_{max}) measured during the measurement period.

L_{dn} or DNL — The day-night average sound level (DNL) is the average of the A-weighted sound levels occurring during a 24-hour period and accounts for the greater sensitivity of most people to noise at night. DNL “penalizes” noise occurring between 10:00 p.m. and 7:00 a.m. by adding 10 dBA to nighttime noise levels.

CNEL — Similar to DNL, the community noise equivalent level treats each evening noise event as though it were three, which adds a 4.77-dB “penalty” for noise events occurring between 7:00 p.m. and 10:00 p.m. Nighttime events are multiplied by ten, which adds a 10-dB penalty to noise events occurring between 10:00 p.m. and 7:00 a.m.

Effects of Noise on People

The effects of noise on people can be placed into three categories: the subjective effects of annoyance, nuisance, and dissatisfaction; interference with activities such as speech, sleep, and learning; and physiological effects such as hearing loss or sudden startling. Environmental noise typically produces effects in the first two categories. Workers at industrial plants often experience noise in the third category. A wide variation exists in the individual thresholds of annoyance, and different tolerances to noise tend to develop based on an individual’s past experiences with noise.

Thus, an important method of predicting human reactions to a new noise environment is to compare the new noise level to the existing noise level to which one has adapted (i.e., the ambient noise level). In general, the more a new noise level exceeds the former ambient noise level, the less acceptable the new noise environment will be judged. A California Department of Transportation (2009) study reports the following human responses to changes in noise levels:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived.
- Outside of the laboratory, a 3-dBA increase is considered a “barely perceptible” difference (i.e., the change in noise is perceived but does not cause a human response).
- An increase of at least 5 dBA is considered a “readily perceptible” difference or the change required to elicit a noticeable change in human response.
- A 10-dBA increase is subjectively heard as an approximate doubling in loudness.

4.12.1.2 Groundborne Vibration

Vibration is an oscillatory motion through a solid medium. In contrast to airborne noise, groundborne vibration is not a common environmental problem. It is unusual for individuals to perceive vibration from sources such as buses and trucks, even in locations near major roads. However, some common vibration sources produce groundborne vibration that can be felt (e.g., construction activities such as blasting, pile driving, and operating heavy equipment).

There are several methods employed to quantify vibration. The measurement used in this analysis—peak particle velocity (PPV)—is defined as the maximum instantaneous peak of the vibration signal. PPV is used to describe vibration impacts on buildings and structures and is expressed in inches per second (in/sec). Typically, groundborne vibration generated by human activity attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration include structures (especially older masonry structures); people (residents, especially the elderly and sick); and locales with vibration-sensitive equipment such as hospitals and research labs.

4.12.2 Setting/Affected Environment

The study area for evaluation of noise and vibration impacts encompasses the project area and the nearest potentially affected sensitive receptors to the proposed facilities. There are no Monterey Bay National Marine Sanctuary (MBNMS) resources that would be affected by impacts identified in this section; all impacts related to noise and vibration would occur outside of MBNMS boundaries. Therefore, MBNMS resources are not described in the environmental setting/affected environment.

Applying a worst case daytime noise level (pile driving at 101 dBA at 50 feet) and the most restrictive daytime noise threshold (exterior speech interference level of 70 dBA, L_{eq}) results in a maximum potential impact distance of 1,800 feet without mitigation. Beyond this distance, all daytime construction noise impacts would be less than significant. Similarly, applying a worst case nighttime noise level (well drilling or open trench work at 81 dBA at 50 feet) and the most restrictive nighttime noise threshold (exterior sleep interference level of 60 dBA, L_{eq}) results in a maximum potential impact distance of 600 feet without mitigation. Beyond this distance, all nighttime construction noise impacts would be less than significant. Consequently, the study area extends 1,800 feet from all trenchless construction receiving pits and 600 feet from all other project elements, including operational sources.

4.12.2.1 Existing Noise Environment

Much of the study area experiences relatively moderate (50 to 60 dBA, L_{eq}) noise levels due to its proximity to noise sources. Vehicle traffic is the predominant source of noise throughout the project area. During peak traffic hours, vehicle noise generally ranges between 50 and 80 dBA, L_{eq} depending on distance from the major roadways. Coastal winds can commonly generate noise levels in the range of 50 to 60 dBA, L_{max}. Typical noise sources in the vicinity of the proposed project components are described below.

Typical Noise Sources

Coastal Dunes and Agricultural Areas

Land uses in the vicinity of the proposed seawater intake system, MPWSP Desalination Plant, and new Desalinated Water Pipeline are dominated by farmland, grazing land, and industrial uses such as the CEMEX sand mining facility at the coast, and the Monterey Regional Water Pollution Control Agency (MRWPCA) Regional Wastewater Treatment Plant and Monterey County Landfill to the east and southeast of the MPWSP Desalination Plant site, respectively. The proposed new Transmission Main would be aligned north-south along the Monterey Peninsula Recreational Trail, through the City of Marina and then crossing over to the west side of Highway 1. Once across Highway 1 the primary sources of noise in these areas are vehicle traffic along Highway 1, farm equipment, industrial vehicles (i.e., truck hauling) and equipment, and coastal winds.

Residential Areas

Southern portions of the new Desalinated Water Pipeline, new Transmission Main, ASR pipelines, ASR-5 and ASR-6 Wells, Carmel Valley Pump Station, and Main System–Hidden Hills Interconnection Improvements are located in residential areas. The primary noise sources are vehicle traffic, school children, and household appliances.

Office/Industrial Areas

Land uses adjacent to the proposed Ryan Ranch–Bishop Interconnection Improvements are primarily office and industrial, including various medical facilities and a school. Vehicles traveling along Ragsdale Drive and Highway 68 are the primary source of noise.

Noise Measurements

Short-term and long-term noise measurements were collected in March 2013, April 2014 and June 2016 to characterize ambient noise conditions at sensitive receptors located near project components. Short-term (10-minute) L_{eq} and L_{max} measurements were taken at thirteen locations during daytime hours. At locations where the potential exists for nighttime construction work, L_{eq} and L_{max} measurements were also taken during nighttime hours. **Tables 4.12-1** and **4.12-2** present the measured short-term and long-term noise levels, respectively. **Figure 4.12-1** shows the noise monitoring locations where representative measurements were collected for each project component.

TABLE 4.12-1
SHORT-TERM NOISE MEASUREMENTS[a]

Map ID[b]	Measurement Location	Time	L_{eq}	L_{max}	Predominant Noise Source(s) during Monitoring
S1	Neponset Road and Lapis Road – Rural residence located 3,900 feet west of MPWSP Desalination Plant site	10:43 a.m. to 10:53 a.m.[c]	61.8	75.0	Vehicle traffic on Highway 1 and trucks at adjacent Dole Food Company processing plant
		10:51 p.m. to 11:01 p.m.[d]	50.5	65.2	
S2	Cosky Road – Residential area in northern Marina, 600 feet east of the new Desalinated Water Pipeline	11:05 a.m. to 11:15 a.m.[c]	66.4	79.8	Vehicle traffic, barking dog
		11:27 p.m. to 11:37 p.m.[d]	42.3	47.6	
S3	Dunes Drive – Marina Dunes RV Park, 3,700 feet west of the new Desalinated Water Pipeline and 4,000 feet south of subsurface slant wells	10:51 a.m. to 11:01 a.m.[d]	54.5	60.3	Distant vehicle traffic on Highway 1
		11:08 p.m. to 11:18 p.m.[d]	51.5	57.1	
S4	Ardennes Circle – Fitch Park military housing area, 50 feet northeast of ASR-5 Well site	12:02 p.m. to 12:12 p.m.[c]	54.3	62.4	Vehicle traffic
		11:55 p.m. to 12:05 a.m.[d]	52.0	72.9	
S6	Tierra Grande Drive – Residential area in unincorporated Monterey County, adjacent to proposed Main System–Hidden Hills Interconnection Improvements	3:13 p.m. to 3:23 p.m.[c]	44.7	64.7	Wind, birds
S7	Rancho San Carlos Road Drive – Residential area in rural Monterey adjacent to Carmel Valley Pump Station	10:04 a.m. to 10:14 a.m.[e]	61.5	73.7	Vehicle traffic
S8	York School located on York Road, 900 feet northeast of Ryan Ranch-Bishop Interconnection Improvements	10:24 a.m. to 10:34 a.m.[d]	45.8	60.1	Distant vehicle traffic
S9	Monte Road –Agricultural residences adjacent to proposed Castroville Pipeline on north side of Salinas River	1:00 p.m. to 1:10 p.m.[e]	75.1	93.3	Vehicle traffic on Highway 1, truck traffic on Monte Road and adjacent Dole Food Company processing plant
		11:51 p.m. to 12:01 a.m.[e]	56.8	65.8	
S10	4th Army Road Drive – Residential area in Seaside 200 feet from new Transmission Main	12:37 p.m. to 12:47 p.m.	50.1	62.3	Vehicle traffic
		12:14 a.m. to 12:24 a.m.	51.4	70.7	
S11	CEMEX active mining area	12:02 p.m.	57.9	60.0	Wave action on shore

NOTES:
[a] Noise measurements were taken at representative locations (see **Figure 4.12-1**) to characterize the existing noise environment in the project area.
[b] Map ID = Noise monitoring locations shown on **Figure 4.12-1**.
[c] Short-term (10-minute) noise measurement collected on March 20, 2013.
[d] Short-term (10-minute) noise measurement collected on April 13, 2014.
[e] Short-term (10-minute) noise measurement collected on June 15, 2016.

SOURCE: ESA, 2013; 2014; 2016.

TABLE 4.12-2
LONG-TERM NOISE MEASUREMENT – MPWSP DESALINATION PLANT

Map ID[a]	Measurement Location	Daytime L_{eq} (7:00 a.m. to 10:00 a.m.)	Nighttime L_{eq} (10:00 p.m. to 7:00 a.m.)	DNL	Predominant Noise Sources during Monitoring
L1	Charles Benson Road, adjacent to MPWSP Desalination Plant site	62	49	62	Agricultural and industrial equipment, haul trucks

NOTE:

[a] Map ID = Noise monitoring locations shown on **Figure 4.12-1**.

SOURCE: ESA, 2013.

As indicated in **Table 4.12-1**, average short-term daytime noise measurements ranged from 44.7 to 75.1 dBA L_{eq}, while maximum noise levels ranged from 60.3 to 93.3 dBA L_{max}. Although noise sources varied from location to location, automobile traffic was the predominant source of noise at most monitoring locations.

One long-term (24-hour) noise measurement was collected at the proposed MPWSP Desalination Plant site (see **Figure 4.12-1**) on March 21 and 22, 2013. This measurement demonstrates that the MPWSP Desalination Plant would operate in a location where the daytime ambient noise environment is dominated by truck traffic and agricultural operations. See **Table 4.12-2** for the measured average daytime L_{eq} (7:00 a.m. to 10:00 p.m.), nighttime L_{eq} (10:00 p.m. to 7:00 a.m.), and DNL values.

Sensitive Receptors

Human response to noise varies considerably from one individual to another. Noise at various levels can interfere with sleep, concentration, and communication and cause physiological and psychological stress and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hotels, hospitals, and nursing homes are considered to be the most sensitive to noise. Places such as churches, libraries, and cemeteries (i.e., where people engage in prayer, study, and contemplation) are also sensitive to noise. Commercial and industrial uses are considered the least noise-sensitive land uses. The distance of the sensitive receptors to project elements is provided in Figure 4.12-1.

4.12.3 Regulatory Framework

This section provides an overview of federal, state, and local environmental laws, policies, plans, and regulations relevant to noise and vibration and indicates whether the proposed project would be consistent with those regulatory requirements. The consistency findings concern the proposed project, without mitigation. Where the proposed project would be consistent with the applicable regulatory requirement, no further discussion of project consistency with that regulatory requirement is provided. Where the proposed project would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to a specific impact topic within

Section 4.12.5, Direct and Indirect Effects of the Proposed Project, where the potential inconsistency is addressed in more detail. Where applicable, the discussion in Section 4.12.5 identifies feasible mitigation that would resolve the potential inconsistency.

Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, whereas local agencies regulate stationary sources within their jurisdictions. Local noise regulation involves the implementation of general plan policies and noise ordinance standards. Local general plans identify broad principles intended to guide and influence development plans; local noise ordinances establish standards and procedures for addressing specific noise sources and activities.

4.12.3.1 Federal Regulations

Federal regulations establish noise limits for medium and heavy duty trucks (more than 4.8 gross tons) under the Code of Federal Regulations, Title 40, Part 205, Subpart B. The federal truck passby noise standard is 80 dBA, L_{max} at 50 feet from the vehicle pathway centerline. These standards are implemented through regulatory controls on truck manufacturers. The MPWSP would be consistent with the federal regulation regarding truck noise because they are required by law and implemented by truck manufacturers. Consequently all trucks used to haul materials to construct the proposed project would be consistent with these federal regulations.

4.12.3.2 State Regulations

State noise regulations consist of requirements for the construction of new hotels, motels, and multi-family dwellings that are not applicable to a water supply project.

The MPWSP would be consistent with the State Title 24 requirements because CalAm would not be constructing residential land uses or any other land use that might be considered a sensitive noise receptor.

4.12.3.3 Applicable Regional and Local Land Use Plans and Policies

Table 4.12-3 presents the state, regional, and local land use plans, policies, and regulations pertaining to noise and vibration that were adopted for the purpose of avoiding or mitigating an environmental effect. Table 4.12-3 also indicates project consistency with such plans, policies, and regulations. Where the analysis concludes the proposed project would be consistent with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes the proposed project would be potentially inconsistent with the applicable plan, policy, or regulation, the reader is referred to the specific impact in Section 4.12.5, Direct and Indirect Effects of the Proposed Project. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project
Figure 4.12-1
Noise Monitoring Locations

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TABLE 4.12-3
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO NOISE AND VIBRATION

<table>
<tr><th>Project Planning Region</th><th>Applicable Plan</th><th>Plan Element/ Section</th><th>Project Component(s)</th><th>Specific Plan, Policy, or Ordinance</th><th>Relationship to Avoiding or Mitigating a Significant Environmental Impact</th><th>Project Consistency with Plan, Policy, or Ordinance</th></tr>
<tr><td>City of Marina (coastal zone and inland areas)</td><td>City of Marina General Plan</td><td>Community Design and Development</td><td>Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main</td><td><table><tr><th rowspan="2">Duration</th><th colspan="2">Maximum Allowable Noise</th></tr><tr><th>Day (7:00 a.m. to 10:00 p.m.)</th><th>Night (10:00 p.m. to 7:00 a.m.)</th></tr><tr><td>Hourly L_{eq} in dB[a,b]</td><td>50</td><td>45</td></tr><tr><td>Maximum Level in dB[a,b]</td><td>70</td><td>65</td></tr><tr><td>Maximum Impulsive Noise in dB[a,c]</td><td>65</td><td>60</td></tr></table>NOTES:
a As determined at the property line of the closest receptor. Noise barriers or other noise attenuation features may be used to achieve the noise standards at the closest sensitive receptor.
b Sound level measurements should be made with slow meter response.
c Sound level measurements should be made with fast meter response.

SOURCE: City of Marina, 2006.</td><td>These noise standards are intended to prevent new or modified stationary noise sources from disrupting adjacent or nearby residential or other noise-sensitive land uses.</td><td><u>Consistent:</u> Subsurface slant wells would each operate on a 300-hp submersible pump encased in a concrete vault and would be located 4,000 feet from the nearest receptor. As discussed in Impact 4.12-5, operational noise levels from slant well pumps would be attenuated to 29 dBA which is well below the allowable noise standards.

There would be no stationary noise sources associated with operation of the new Desalinated Water Pipeline or the new Transmission Main.</td></tr>
<tr><td>City of Marina (coastal zone and inland areas)</td><td>Marina Municipal Code</td><td>Chapter 15.04 – General Provisions</td><td>Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main</td><td>Section 15.04.055 - Construction hours and noise. Applies to any construction activities that require a building, grading, demolition, use, or other city permit. This section limits outside construction, repair work, or related activities that produce noise adjacent to residential uses, including transient lodging, to the hours of 7:00 a.m. to 7:00 p.m. (standard time) Monday through Saturday, and 10:00 a.m. to 7:00 p.m. (standard time) on Sundays and holidays. During daylight savings time, construction hours may be extended to 8:00 p.m. However, no construction activities, tools, or equipment may produce a noise level of more than 60 dBA for twenty-five percent of an hour at any receiving property line.</td><td>This ordinance is intended to reduce construction noise levels and limit noisy construction activity to the least sensitive hours of the day.</td><td><u>Potentially Inconsistent:</u> All construction activity is assessed with respect to noise level standards in local and regional plans and policies in Impact 4.12-2. Construction of the new Desalinated Water Pipeline, and new Transmission Main could occur as close as 100 feet from existing residences and could be deemed inconsistent if nighttime construction work were conducted or if daytime construction work were to exceed 60 dBA, L_{25}. Mitigation Measures 4.12-1b (General Noise Controls for Construction Equipment) and 4.12-1c (Noise Control Plan for Nighttime Pipeline Construction) would ensure that construction of the new Desalinated Water Pipeline, and new Transmission Main would be consistent with the Marina Municipal Code.

Nighttime construction of the subsurface slant wells and the Source Water Pipeline would not occur adjacent to a residential use.</td></tr>
<tr><td>Fort Ord Dunes State Park</td><td>Fort Ord Dunes State Park General Plan and Environmental Impact Report</td><td>Physical Resources</td><td>New Transmission Main</td><td>NOI-3: Develop noise abatement measures as part of the planning and design process for area-specific projects, to minimize disturbance to park visitors, neighbors, and sensitive wildlife identified as occurring in the area during construction. The following construction measures should be considered:
● Restrict construction activities to daytime hours, where feasible
● Use best available noise control techniques wherever feasible, including those for vehicles and construction equipment
● Use hydraulically or electrically powered impact tools when feasible
● Locate stationary noise sources as far from sensitive receptors as feasible
● To the extent feasible, avoid construction during the nesting/breeding seasons of sensitive wildlife known to occur in the project vicinity.</td><td>This policy is intended to minimize noise disturbance to park visitors, neighbors, and sensitive wildlife during construction.</td><td><u>Potentially Inconsistent:</u> Construction of the new Transmission main would occur within the jurisdiction of Fort Ord Dunes State Park and could occur during nesting/breeding seasons of sensitive wildlife. This inconsistency is assessed in Impact 4.12-2 as well as in Impact 4.6-1 of the Terrestrial Biology Section. Implementation of Mitigation Measures 4.12-1a (Neighborhood Notice), 4.12-1b (General Noise Controls for Construction Equipment), and 4.12-1c (Noise Control Plan for Nighttime Pipeline Construction) would ensure that construction of the new Transmission Main would be consistent with Policy NOI-3 of the Fort Ord Dunes State Park General Plan. Additionally, Mitigation Measures 4.6-1b, 1c, 1e, 1f, 1g, 1g, 1h. 1h, 1i, 1j, 1l and 1n of the Terrestrial Biology section address avoidance of construction impacts during wildlife nesting and breeding seasons.</td></tr>
</table>

TABLE 4.12-3 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO NOISE AND VIBRATION

<table>
<tr><th>Project Planning Region</th><th>Applicable Plan</th><th>Plan Element/ Section</th><th>Project Component(s)</th><th>Specific Plan, Policy, or Ordinance</th><th>Relationship to Avoiding or Mitigating a Significant Environmental Impact</th><th>Project Consistency with Plan, Policy, or Ordinance</th></tr>
<tr><td>City of Monterey (inland areas)</td><td>Monterey City Code</td><td>Chapter 38 – Zoning Ordinance</td><td>Ryan Ranch-Bishop Interconnection Improvements</td><td>Section 38-112.2 – Limitation on Construction Hours. The following time restrictions are placed on construction activities: Monday through Friday, 7:00 a.m. to 7:00 p.m.; Saturday, 8:00 a.m. to 6:00 p.m.; and Sunday, 10:00 a.m. to 5:00 p.m. The City will consider requests to perform construction outside of these time limits under certain circumstances.</td><td>This ordinance is intended to limit noisy construction activity to the least sensitive hours of the day.</td><td><u>Potentially Inconsistent:</u> Nighttime construction work could occur where allowed by ordinance. This inconsistency is assessed in Impact 4.12-4. All nighttime construction work would be conducted only with prior approval from the relevant jurisdictions.</td></tr>
<tr><td>City of Monterey (inland areas)</td><td>Monterey City Code</td><td>Chapter 38 – Zoning Ordinance</td><td>Ryan Ranch-Bishop Interconnection Improvements</td><td>Section 38-111A – Performance Standards. Identifies performance standards for each zoning district, as shown below. Decibel levels must be compatible with neighboring uses, and new uses cannot cause ambient noise levels to exceed these standards. If the noise exposure resulting from a project would be greater than that identified in the table, the City of Monterey's community development director may require the project sponsor to perform an acoustical study.

CITY OF MONTEREY – MAXIMUM NOISE STANDARDS[a]
<table>
<tr><th>Zone of Property Receiving Noise</th><th>Maximum Noise Level (dBA)</th></tr>
<tr><td>OS – Open Space District</td><td>60</td></tr>
<tr><td>R – Residential Districts</td><td>60</td></tr>
<tr><td>PS – Public and Semi-Public District</td><td>60</td></tr>
<tr><td>C – Commercial District</td><td>65</td></tr>
<tr><td>I – Industrial Districts</td><td>70</td></tr>
<tr><td>PD – Planned Development</td><td>Study Required</td></tr>
</table>
NOTE:
a These noise standards shall be modified as follows to account for the effects of time and duration on the impact of noise levels: In R districts, the noise standard shall be 5 dB lower between 10:00 p.m. and 7:00 a.m.; noise that is produced for no more than a cumulative period of five minutes in any hour may exceed the standards above by 5 dB; and noise that is produced for no more than a cumulative period of one minute in any hour may exceed the standards above by 10 dB.

SOURCE: City of Monterey, 2008.</td><td>These noise standards are intended to prevent new or modified stationary noise sources from disrupting adjacent or nearby residential or other noise-sensitive land uses.</td><td><u>Consistent:</u> There are no stationary noise sources proposed for the Ryan Ranch-Bishop Interconnection Improvements.</td></tr>
<tr><td>City of Seaside (coastal zone and inland areas)</td><td>Seaside General Plan</td><td>Circulation</td><td>New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline</td><td>Policy C-1.7: Reduce impacts on residential neighborhoods from truck traffic and related noise.</td><td>This policy is intended to protect residential areas from disruptive truck traffic and related noise. This policy is implemented through two measures: (1) establish truck routes for the trucking industry and (2) restrict truck parking within the city.</td><td><u>Consistent:</u> Construction trucks would remove excavated material and bring in clean fill for pipelines. Construction-related truck trips would be dispersed throughout the day and would not substantially increase noise, as these trips would only marginally increase traffic on the local road network.</td></tr>
<tr><td>City of Seaside (coastal zone and inland areas)</td><td>Seaside General Plan</td><td>Noise</td><td>New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline</td><td>Policy N-1.1: Ensure that new development and reuse/revitalization projects can be made compatible with the noise environment and existing development

Implementation Plan N-1.1.1 Compatible Development: Review discretionary development proposals for potential on- and offsite stationary and vehicular noise impacts per the California Environmental Quality Act (CEQA). Any proposed development located within a 60 dB or higher noise contour shall be reviewed for potential noise impacts and compliance with the noise and land use compatibility standards. The thresholds established in the Zoning Ordinance, Noise Ordinance, the Noise Contours Map and Tables of the Noise Element (seen in the table below) will be used to determine the significance of impacts.

If potential impacts are identified, mitigation in the form of noise reduction designs/ structures will be required to reduce the impact to a level less than significant. If the impact cannot be reduced to a level less than significant or avoided with accepted noise reduction methods, the proposed project will be determined “Clearly Unacceptable” and will not be approved.</td><td>These noise standards are intended to prevent new or modified stationary and vehicular noise sources from disrupting adjacent or nearby residential or other noise-sensitive land uses.</td><td><u>Potentially Inconsistent:</u> Operational noise from the ASR-5 and ASR-6 well pumps to exceed the land use compatibility standards This inconsistency is assessed in Impact 4.12-5. Only the ASR-5 and ASR-6 wells would have stationary noise sources (pumps) after construction and these would be enclosed. None of the other project components proposed in Seaside and on lands within federal jurisdiction would exceed the allowable noise standards for non-construction-related noise sources. While the potential exists for the ASR-5 and ASR-6 well pumps to exceed the land use compatibility standards, Mitigation Measure 4.12-5 Stationary Source Noise Controls would ensure project consistency with Policy N-1.1.</td></tr>
</table>

TABLE 4.12-3 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO NOISE AND VIBRATION

<table>
<tr><th>Project Planning Region</th><th>Applicable Plan</th><th>Plan Element/ Section</th><th>Project Component(s)</th><th>Specific Plan, Policy, or Ordinance</th><th>Relationship to Avoiding or Mitigating a Significant Environmental Impact</th><th>Project Consistency with Plan, Policy, or Ordinance</th></tr>
<tr><td>City of Seaside (coastal zone and inland areas)
(cont.)</td><td></td><td></td><td></td><td>
CITY OF SEASIDE – LAND USE COMPATIBILITY GUIDELINES
<table>
<tr><th rowspan="2">Land Use Category</th><th colspan="7">Community Noise Equivalent Level (CNEL)</th></tr>
<tr><th colspan="2">55</th><th>60</th><th>65</th><th>70</th><th>75</th><th>80</th></tr>
<tr><td>Residential – Single-Family, Multifamily, and Duplex</td><td>A</td><td>A</td><td>B</td><td>B</td><td>C</td><td>U</td><td>U</td></tr>
<tr><td>Residential – Mobile homes</td><td>A</td><td>A</td><td>B</td><td>C</td><td>C</td><td>U</td><td>U</td></tr>
<tr><td>Transient Lodging – Hotels and Motels</td><td>A</td><td>A</td><td>B</td><td>B</td><td>C</td><td>C</td><td>U</td></tr>
</table>
NOTES:
A = Normally Acceptable. Specified land use is satisfactory based on the assumption that any new structures are conventional construction, without any special noise insulation requirements.
B = Conditionally Acceptable. New construction or development may be undertaken only after completion of a detailed noise analysis and appropriate noise insulation features have been incorporated into the project design. New development is assumed to be conventional construction, but with closed windows and air circulation systems or air conditioning.
C = Normally Unacceptable. New construction or development shall generally be discouraged. If it does proceed, a detailed analysis of the noise reduction requirements shall be made and needed noise insulation features included in the design.
U = Clearly Unacceptable. New construction or development that includes the specified land use is discouraged.
</td><td></td><td></td></tr>
<tr><td>City of Seaside (coastal zone and inland areas)</td><td>Seaside General Plan</td><td>Noise</td><td>New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline</td><td>Policy N-2.1: Reduce noise impacts associated with motorized vehicles, aircraft and trains.</td><td>This qualitative noise ordinance is intended to protect the public from motorized vehicle, aircraft, and train noise.</td><td><u>Consistent.</u> Project components proposed for Seaside would generate a small number of vehicle trips for occasional maintenance. Such trips would not cause substantial increases in traffic volumes or associated transportation noise. The proposed project would not generate increases in aircraft or train operations.</td></tr>
<tr><td>City of Seaside (coastal zone and inland areas)</td><td>Seaside General Plan</td><td>Noise</td><td>New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline</td><td>Policy N-3.1: Reduce the impacts of noise-producing land uses, activities, and businesses on noise-sensitive land uses.

Implementation Plan N-1.3.1: Enforcement of non-transportation noise standards. Enforce the noise limits and construction and operation regulations contained in this Noise Element and in the City's Municipal Code.

Implementation Plan N-1.3.3: Construction noise limits. Require all construction activity to comply with the limits (maximum noise levels, hours and days of allowed activity) established in the City noise regulations (Title 24 California Code of Regulations, Zoning Ordinance and Chapter 21A of the Municipal Code).</td><td>This policy is intended to prevent construction and new or modified stationary noise sources from disrupting adjacent or nearby noise-sensitive land uses.</td><td><u>Potentially Inconsistent:</u>

The project components proposed for Seaside would conflict with Implementation Plan N-1.3.3. Nighttime construction may be required for the new Transmission Main, which would exceed the time limits set forth in the City's noise regulations. This issue is addressed in Impact 4.12-4. Cal Am would seek prior approval from the City of Seaside to work outside of these hours. Because the City of Seaside Municipal Code could allow construction activity outside listed hours under certain circumstances, the construction activities would not violate local regulations.</td></tr>
<tr><td>City of Seaside (coastal zone and inland areas)</td><td>Seaside Municipal Code</td><td>Chapter 17.30 - Standards for All Development and Land Uses</td><td>New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline</td><td>Section 17.30.060 - establishes noise standards designed to ensure that noise producers do not adversely affect sensitive receptors. The table below identifies Seaside's regulatory noise levels.

CITY OF SEASIDE – MAXIMUM EXTERIOR AND INTERIOR NOISE STANDARDS
<table>
<tr><th rowspan="2">Land Use</th><th colspan="2">Noise Standard in Community Noise Equivalent Level (CNEL)</th></tr>
<tr><th>Exterior (dBA)</th><th>Interior (dBA)</th></tr>
<tr><td>Residential</td><td>65</td><td>45</td></tr>
<tr><td>Mixed-Use Residential</td><td>70</td><td>45</td></tr>
<tr><td>Commercial</td><td>70</td><td>---</td></tr>
<tr><td>Office</td><td>70</td><td>50</td></tr>
<tr><td>Industrial</td><td>75</td><td>55</td></tr>
<tr><td>Public Facilities</td><td>70</td><td>50</td></tr>
<tr><td>Schools</td><td>80</td><td>50</td></tr>
</table>
</td><td>These noise standards are intended to prevent new or modified stationary noise sources from disrupting adjacent or nearby residential or other noise-sensitive land uses.</td><td><u>Potentially Inconsistent:</u> This inconsistency is assessed in Impact 4.12-5. Only the ASR-5 and ASR-6 wells would have stationary noise sources (pumps) after construction and these would be enclosed. None of the other project components proposed in Seaside and on lands within federal jurisdiction would exceed the allowable noise standards for non-construction-related noise sources. While the potential exists for the ASR-5 and ASR-6 well pumps to exceed exterior noise standards, Mitigation Measure 4.12-5 Stationary Source Noise Controls would ensure project consistency with Policy N-1.1.</td></tr>
</table>

TABLE 4.12-3 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO NOISE AND VIBRATION

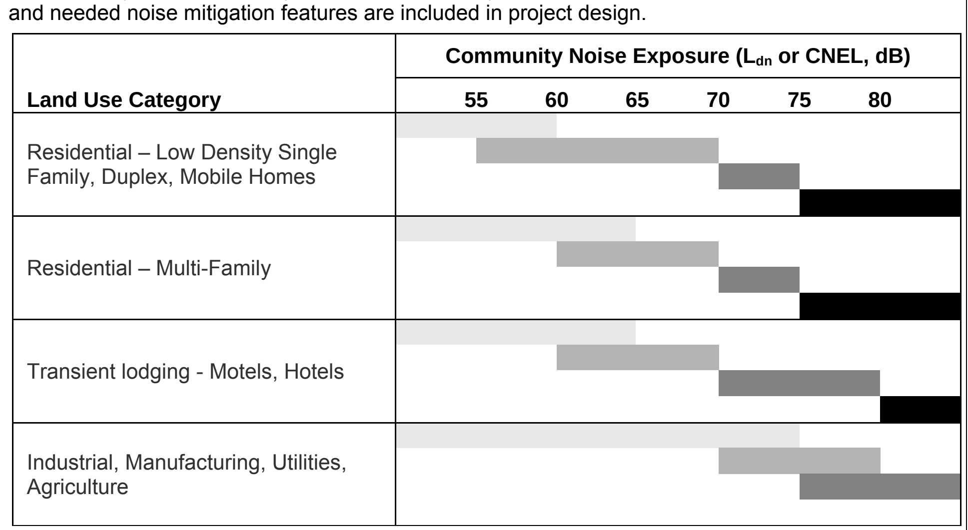
Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 9.12 – Noise Regulations	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Section 9.12.030 (D) -*** sets time limits for construction activities, including demolition, excavation, erection, alteration, or repair. These activities may not occur before 7:00 a.m. or after 7:00 p.m. (except on Saturday, Sunday, and holidays, when the allowable construction hours are 9:00 a.m. to 7:00 p.m.) unless authorized in writing by a building official.	This ordinance is intended to limit noisy construction activity to the least sensitive hours of the day.	<u>Potentially Inconsistent:</u> Some of the project components proposed for Seaside would be constructed during nighttime hours, outside of those specified in the municipal code. This issue is addressed in Impact 4.12-4. Cal Am would seek prior approval from the City of Seaside to work outside of these hours. Because the City of Seaside Municipal Code could allow construction activity outside listed hours under certain circumstances, the construction activities would not violate local regulations.
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 10.60 – Noise Control	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Road Interconnection Improvements	***Chapter 10.60.030 - Operation of noise-producing devices restricted.*** No person shall, within the unincorporated limits of the County of Monterey, operation of any machine, mechanism, device, or contrivance that produces a noise level exceeding 85 dBA at 50 feet from the source. The code does not apply to such noise sources when they are operated farther than 2,500 feet from any occupied dwelling unit.	These noise standards are intended to prevent new or modified stationary noise sources from disrupting adjacent or nearby residential or other noise-sensitive land uses.	<u>Consistent:</u> The only equipment that is proposed for project components within unincorporated Monterey County that would generate a noise level in excess of 85 dBA at 50 feet would be sheet pile drivers for potential jack-and-bore or other trenchless installation technologies for the Source Water Pipeline or the new Desalinated Water Pipeline. However, the probable locations of such activity would be greater than 2,500 feet from sensitive receptors.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Road Interconnection Improvements	***Policy S-7.2:*** New development projects must incorporate design elements necessary to minimize noise impacts on surrounding land uses and to reduce noise in indoor spaces to acceptable levels.	This qualitative noise policy is intended to prevent new sensitive receptors from being impacted by existing noise sources as well as to prevent new or modified stationary noise sources from disrupting adjacent or nearby noise-sensitive land uses.	<u>Potentially Inconsistent:</u> The Main System-Hidden Hills Interconnection Improvements would generate noise at levels that could disrupt nearby land uses and/or generate potentially unacceptable indoor noise levels at nearby receptors. This issue is addressed in Impact 4.12-5. Mitigation Measure 4.12-5: Stationary-Source Noise Controls is identified to ensure that operational pump noise is consistent with Policy S.7-2.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Road Interconnection Improvements	***Policy S-7.4:*** New noise generators may be allowed in areas where projected noise levels are “conditionally acceptable” only after a detailed analysis of the noise reduction requirements is made and needed noise mitigation features are included in project design. 	This policy is intended to ensure new noise generators do not adversely affect existing or future noise-sensitive land uses.	<u>Consistent:</u> The Carmel Valley Pump Station would create a new stationary noise source in an area where the projected noise levels are conditionally acceptable (see Table 4.12-1). This issue is addressed n Impact 4.12-6 and analysis provided to demonstrate consistency with Policy S.7-4. No other Monterey County project components propose new stationary noise sources adjacent to sensitive land uses within such areas.

TABLE 4.12-3 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO NOISE AND VIBRATION

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Road Interconnection Improvements	***Policy S-7.5:*** New noise generators are discouraged in areas identified as "normally unacceptable." (see Table in Policy S-7.4) Where such new noise generators are permitted, mitigation to reduce both the indoor and outdoor noise levels are required.	This policy is intended to ensure new noise generators do not adversely affect noise-sensitive land uses.	Consistent: The proposed project would not create new stationary noise sources in areas identified as "normally unacceptable".
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Road Interconnection Improvements	***Policy S-7.6:*** Acoustical analysis shall be part of the environmental review process for projects when: b. Proposed noise generators are likely to produce noise levels exceeding the levels shown in the adopted Community Noise Ordinance when received at existing or planned noise-sensitive receptors.	This policy is intended to ensure new noise-sensitive land uses are compatible with existing uses on adjacent lands, and to protect existing noise-sensitive land uses from new stationary sources.	Consistent: None of the proposed project components within this jurisdiction would create new noise-sensitive land uses nor generate noise levels exceeding the levels in the Community Noise Ordinance.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Road Interconnection Improvements	***Policy S-7.8:*** All discretionary projects that propose to use heavy construction equipment that has the potential to create vibrations that could cause structural damage to adjacent structures within 100 feet shall be required to submit a pre-construction vibration study prior to the approval of a building permit. Projects shall be required to incorporate specified measures and monitoring identified to reduce impacts. Pile driving or blasting are illustrative of the type of equipment that could be subject to this policy.	This policy is intended to protect existing structures from construction-related vibration damage.	Consistent: Construction of the MPWSP Desalination Plant, in-County portions of the Source Water Pipeline, Desalinated Water Pipeline, Brine Discharge Pipeline, and Salinas Valley Return Pipeline would require the use of construction equipment but (sheet) pile driving would only potentially occur for the Source Water Pipeline and the new Desalinated Water Pipeline which are greater than 100 feet from the nearest in-County receptor. Heavy equipment would not cause structural damage to adjacent structures within 100 feet of their respective project sites. No other project components proposed for Monterey County would operate such equipment.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Road Interconnection Improvements	***Policy S-7.9:*** No construction activities pursuant to a County permit that exceed "acceptable" levels listed in *Policy S-7.1* shall be allowed within 500 feet of a noise sensitive land use during the evening hours of Monday through Saturday, or anytime on Sunday or holidays, prior to completion of a noise mitigation study. Noise protection measures, in the event of any identified impact, may include but not be limited to: • Constructing temporary barriers; or • Using quieter equipment than normal.	This policy is intended to protect noise-sensitive land uses from construction-related noise disruption.	Potentially Inconsistent: Construction of the Castroville Pipeline would generate noise in excess of acceptable levels and occur within 500 feet of a noise sensitive land use. This inconsistency is assessed in Impact 4.12-2. Implementation of Mitigation Measure 4.12-1c (Noise Control Plan for Nighttime Pipeline Construction) would ensure that construction activities would be consistent with Policy S-7.9 and reduce the nighttime construction noise impact to a less-than-significant level.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Road Interconnection Improvements	***Policy S-7.10:*** Construction projects shall include the following standard noise protection measures: • Construction shall occur only during times allowed by ordinance/code unless such limits are waived for public convenience; • All equipment shall have properly operating mufflers; and • Laydown yards and semi-stationary equipment such as pumps or generators shall be located as far from noise-sensitive land uses as practical.	This policy is intended to protect noise-sensitive land uses from construction-related noise disruption.	Potentially Inconsistent: Project components within unincorporated Monterey County that would require nighttime construction include a portion of the Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Castroville Pipeline and the Pipeline to the CSIP Pond. Construction of these facilities would operate equipment and require staging areas. This issue is addressed in Impacts 4.12-1 and 4.12-2.

TABLE 4.12-3 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO NOISE AND VIBRATION

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Noise	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Noise Policy B-2:*** By complying with the noise guidelines presented in Tables 4.5-3 and 4.5-4, the City shall ensure that new development does not adversely affect existing or proposed uses. ***Noise Policy B-3:*** The City shall require that acoustical studies be prepared by qualified acoustical engineers for all new development that could result in noise environments above noise range I (normally acceptable environment), as defined in Table 4.5-3. The studies shall identify the mitigation measures that would be required to comply with the noise guidelines, specified in Tables 4.5-3 and 4.5-4, to ensure that existing or proposed uses will not be adversely affected. The studies should be submitted prior to accepting development applications as complete.	This policy is intended to protect existing and potential future noise-sensitive land uses from new noise generators.	<u>Potentially Inconsistent:</u> Only the ASR-5 and ASR-6 wells would have stationary noise sources (pumps) after construction and these would be enclosed. None of the other project components proposed in FORA jurisdiction would exceed the allowable noise standards for non-construction-related noise sources. This inconsistency is assessed in Impact 4.12-6.While the potential exists for the ASR-5 and ASR-6 well pumps to exceed exterior noise standards, Mitigation Measure 4.12-5 Stationary Source Noise Controls would ensure project consistency with Policy B-2.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Noise	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Noise Policy B-8:*** If the ambient DNL exceeds the normally acceptable noise range for public or institutional uses (passively and actively used open spaces; auditoriums, concert halls, and amphitheaters; schools, libraries, churches, hospitals and nursing homes; golf courses, riding stables, water recreation areas, and cemeteries), as identified in Table 4.5-3, new development shall not increase ambient L_{dn} by more than 3 dBA measured at the property line.	This policy is intended to limit noise level increases from new development to 3 dBA, if the existing noise levels exceed normally acceptable standards for public or institutional land uses.	<u>Consistent:</u> Proposed project components within FORA that would be located near a public or institutional land use include the ASR Conveyance Pipeline, ASR pump-to Waste Pipeline and the ASR recirculation Pipeline. Operation of these pipelines would not increase ambient L_{dn} by more than 3 dBA.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Noise	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Noise Policy B-9:*** The City shall require construction contractors to employ noise-reducing construction practices.	This policy is intended to minimize construction noise.	<u>Potentially Inconsistent:</u> Construction activities within the city of Seaside and FORA jurisdiction would need to include noise-reducing construction practices to be consistent with this policy. This issue is addressed under Impact 4.12-2. Implementation of Mitigation Measure 4.12-1b (General Noise Controls for Construction Equipment) would ensure that construction contractors to employ noise-reducing construction practices. With implementation of this mitigation, the project would be consistent with the intent of Noise Policy B-9.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Noise	Ryan Ranch–Bishop Interconnection Improvements	***Noise Policy B-2:*** By complying with the noise guidelines presented in Tables 4.5-3 and 4.5-4, the County shall ensure that new development does not adversely affect existing or proposed uses. ***Noise Policy B-3:*** The County shall require that acoustical studies be prepared by qualified acoustical engineers for all new development that could result in noise environments above noise range I (normally acceptable environment), as defined in Table 4.5-3. The studies shall identify the mitigation measures that would be required to comply with the noise guidelines, specified in Tables 4.5-3 and 4.5-4, to ensure that existing or proposed uses will not be adversely affected. The studies should be submitted prior to accepting development applications as complete.	This policy is intended to protect existing and potential future noise-sensitive land uses from new noise generators.	<u>Potentially Inconsistent:</u> Ryan Ranch–Bishop Interconnection Improvements would have stationary noise sources (pumps) after construction and these would be enclosed. This inconsistency is assessed in Impact 4.12-6. While the potential exists for the pumps to exceed exterior noise standards, Mitigation Measure 4.12-5 Stationary Source Noise Controls would ensure project consistency with Policy B-2 and B-3.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Noise	Ryan Ranch–Bishop Interconnection Improvements	***Noise Policy B-8:*** If the ambient DNL exceeds the normally acceptable noise range for passively and actively used open spaces; auditoriums, concert halls, and amphitheaters; schools, libraries, churches, hospitals and nursing homes; golf courses, riding stables, water recreation areas, and cemeteries), as identified in Table 4.5-3, new development shall not increase ambient L_{dn} by more than 3 dBA measured at the property line.	This policy is intended to limit noise level increases from new development to 3 dBA, if the existing noise levels exceed normally acceptable standards for public or institutional land uses.	<u>Consistent:</u> Although the Ryan Ranch–Bishop Interconnection Improvements would be within 900 feet of a school, it would have no stationary sources.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Noise	Ryan Ranch–Bishop Interconnection Improvements	***Noise Policy B-9:*** The County shall require construction contractors to employ noise-reducing construction practices.	This policy is intended to minimize construction noise.	<u>Potentially Inconsistent:</u> Construction activities of the Ryan Ranch–Bishop Interconnection Improvements within FORA jurisdiction would need to include noise-reducing construction practices to be consistent with this policy. This issue is addressed under Impact 4.12-2. Implementation of Mitigation Measure 4.12-1b (General Noise Controls for Construction Equipment) would ensure that construction contractors to employ noise-reducing construction practices. With implementation of this mitigation, the project would be consistent with the intent of Noise Policy B-9.

SOURCE: California State Parks, 2004; City of Marina, 2000; City of Seaside, 2004; FORA, 1997; Monterey County, 2010.

4.12.4 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to noise and vibration if it would:

- Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies;
- Expose people or structures to or generate excessive groundborne vibration or groundborne noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity;
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity during construction;
- Conflict with the construction time limits established by the local jurisdiction;
- For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within 2 miles of a public airport or public use airport, expose people residing or working in the area to excessive noise levels; or
- For a project located in the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

Due to the nature of the proposed facilities, no impacts related to the following significance criteria would result for the reasons described below:

- ***Expose people or structures to or generate excessive groundborne noise levels.*** The second criterion above relates to groundborne vibration and groundborne noise levels but only the issue of groundborne vibration is relevant to the proposed project. Groundborne noise occurs when vibrations transmitted through the ground result in secondary radiation of noise. Groundborne noise is generally associated with underground railway operations and with construction activities such as blasting, neither of which would result from project implementation. Operation of the Project would not involve equipment that would produce ground borne vibration; therefore no impacts related to the exposure of people or structures to, or the generation of, excessive groundborne noise levels would occur in connection with Project operations. The potential for construction activities to result in groundborne vibration is addressed in Impact 4.12-3.

- ***Be located within an airport land use plan area or within 2 miles of a public airport or public use airport and expose people to excessive noise levels.*** The closest public airport to the project area is the Monterey Peninsula Airport, which is approximately 0.3 miles south of the new Transmission Main. The Marina Municipal Airport, which is located north of the intersection of Reservation Road and Imjin Road in Marina, is located 1.7 miles east of the new Desalinated Water Pipeline. In addition, the Ryan Ranch-Bishop Interconnection Improvements would be located within the 65 dBA CNEL noise contour on the “Noise Exposure Map for Forecast Conditions” in the *Comprehensive Land Use Plan for Monterey Peninsula Airport* (Monterey County Airport Land Use Commission, 1987). Even though some project components would be within 2 miles of an airport and certain facilities would be sited within the 65 dBA CNEL noise contour established in the applicable airport plan, none of the facilities located within 2 miles of an airport would result in operational noise increases, nor would they constitute noise-sensitive land uses (i.e., the proposed project does not include the construction of new housing or other noise-sensitive receptors that would be subject to aviation noise). As a result, there would be no impacts related to the fifth criterion and this issue is not addressed further below.

- ***Be located in the vicinity of a private airstrip and expose people to excessive noise levels.*** None of the proposed facilities would be sited in the vicinity of a private airstrip. Therefore, the proposed project would have no impact related to this criterion and this issue is not discussed further below.

4.12.5 Approach to Analysis

4.12.5.1 Temporary or Periodic Increases in Ambient Noise Levels

A "substantial" noise increase is defined as one that would interfere with human activities during the day and/or night (as opposed to an absolute, numerical increase over ambient noise levels).

This evaluation uses speech interference as an indicator that construction noise could cause a substantial adverse impact on daytime and evening activities, and sleep interference as an indicator that construction noise could cause a substantial adverse impact on nighttime activities. The speech and sleep interference criteria are based on objective research of speech and sleep interference (as opposed to subjective surveys of annoyance) can be used to evaluate a project's noise impacts. The speech and sleep interference criteria used in this EIR/EIS are defined below:

- **Speech Interference.** A speech interference threshold, in the context of impact duration and time of day, is used to identify substantial increases in noise from temporary construction activities. This analysis assumes noise peaks generated by construction equipment could result in speech interference in adjacent buildings if the noise level in the interior of the buildings exceeds 45 dBA. A typical building can reduce noise levels by approximately 25 dBA with the windows closed (USEPA, 1974). This noise reduction could be maintained only on a temporary basis in some cases, since it assumes windows must remain closed at all times. Assuming a 25 dBA reduction with the windows closed, an exterior noise level of 70 dBA L_{eq} would maintain an acceptable interior noise environment of 45 dBA during the day and evening hours. Noise levels would vary depending on the phase of construction and the types of construction equipment being used.

  In addition to the decibel level of noise, the duration of exposure at any given noise-sensitive receptor is an important factor in determining an impact's significance. Generally, temporary construction noise that occurs during the day for a relatively short period of time would not be significant because most people of average sensitivity who live in suburban or rural agricultural environments are accustomed to a certain amount of construction activity or heavy equipment noise from time to time. The loudest construction-related noise levels would be sporadic rather than continuous because different types of construction equipment would be used throughout the construction process. Therefore, an exterior noise level that exceeds 70 dBA Leq during the daytime is used as the threshold for substantial construction noise where the duration of construction noise exceeds two weeks.[2]

[2] The two-week (10 working days) duration is used as a duration threshold by some local noise ordinances, less than which louder construction noise exposure is more tolerable (e.g., Noise Ordinance No. 11895, City of Oakland, 1996; Construction Noise Threshold Criteria and Control Plan, Ventura County, 2010).

- **Sleep Interference.** Based on available sleep data, an interior nighttime level of 35 dBA is considered acceptable for sleeping (USEPA, 1974). Assuming a 25 dBA reduction with the windows closed, an exterior noise level of 60 dBA would maintain an acceptable interior noise environment of 35 dBA at night. Therefore, a significant impact would occur if the proposed project were to generate exterior noise levels above the 60 dBA L_{eq} sleep interference threshold with the windows closed, or 35 dBA at night with the windows open, for one or more nights.

This analysis is based on monitored ambient noise levels at sensitive receptors throughout the project area (see **Table 4.12-1**),[3] the anticipated construction work hours for each facility, published equipment noise levels, and the attenuated construction equipment noise levels at the sensitive receptor, calculated using published noise propagation equations (FHWA, 2006). Standard mitigation measures to reduce construction-related noise levels have been demonstrated to reduce equipment noise by 5 to 10 dBA (Bolt et. al., 1971). Moveable sound barrier curtains can provide 15 dBA of sound attenuation (INC, 2014). Static sound barrier curtains can provide sound transmission loss of 16 to 40 dBA, depending on the frequency of the noise source (ENC, 2014).

Noise Levels Standards

Consistency with local noise standards are determined by comparing the applicable noise level standard to published equipment noise levels. In some cases this requires calculating noise levels at various distances (i.e., to a property line or sensitive receptor) using widely published noise propagation equations (FHWA, 2006) in order to assess whether a potential conflict could occur.

Separate assessments are made for noise generated during project construction (see Impact 4.12-2) versus noise generated during project operations (see Impact 4.12-5). While all of the jurisdictions have established land use noise compatibility standards for ambient noise levels, only a few jurisdictions have established noise level standards for construction. For jurisdictions that do not have established construction noise level standards, no analysis is provided for construction noise. The construction time limits adopted by many jurisdictions are not considered a significance threshold for the assessment of construction noise impacts related to the generation of noise levels in excess of established construction noise level standards; however, construction time limits are considered in the analysis of project consistency with regional and local plans and policies (see Impact 4.12-4).

Groundborne Vibration during Construction

The proposed project would result in significant impacts if it were to generate vibration levels substantial enough to damage nearby structures or buildings, or result in vibration levels that are commonly accepted as an annoyance to sensitive land uses.

With the exception of the *Monterey General Plan*, which specifies submission of a vibration study for projects that would involve pile driving or blasting, none of the other local regulations address vibration or provide numerical thresholds for identifying groundborne vibration impacts. In the absence of local standards for construction equipment vibration, the evaluation presented

[3] Existing ambient noise levels were monitored at some but not all of the sensitive receptors; in some cases the ambient noise level is based on monitored ambient noise levels at representative sensitive receptor locations.

under Impact 4.12-3 uses the vibration thresholds presented in **Table 4.12-4**. For adverse human reaction, this analysis applies the "strongly perceptible" threshold of 0.1 in/sec PPV (Caltrans, 2004). For risk of architectural damage to historic buildings and structures, this analysis applies a threshold of 0.12 in/sec PPV (Wilson, Ihrig, & Associates et al., 2012). A threshold of 0.3 in/sec PPV is used for all other buildings. The Federal Transit Administration (FTA) provides an equation that may be used to estimate vibration at different distances based on a reference PPV of 25 feet for various construction equipment. Using the FTA equation, the distances at which vibration-generating construction equipment would be lower than the annoyance or damage thresholds were calculated and compared to potential distances to receiving buildings.

TABLE 4.12-4
VIBRATION THRESHOLDS

	Maximum Peak Particle Velocity (PPV), inches per second (in/sec)
Adverse human reaction (human annoyance)[a] Historic buildings and structures[b]	0.1 0.12
All other structures	0.3

NOTE: The vibration criteria is based on continuous or frequent intermittent sources, including impact pile drivers, pogo-stick compactors, crack and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

SOURCES: [a]Caltrans, 2004; [b]Wilson, Ihrig & Associates et al., 2012.

4.12.5.2 Permanent Increases in Ambient Noise Levels

For the analysis of long-term operational impacts on the existing ambient noise environment, impacts are considered significant if operation of the project facilities would result in a substantial increase in noise levels in the project area. This evaluation uses a 5-dBA increase in noise exposure—which Caltrans identifies as a readily perceptible noise increase (Caltrans, 2009) —to assess the significance of operational noise increases on ambient noise levels in the project vicinity.

4.12.6 Direct and Indirect Effects of the Proposed Project

Table 4.12-5 summarizes the MPWSP's impacts and significance determinations related to noise and vibration.

TABLE 4.12-5
SUMMARY OF IMPACTS – NOISE AND VIBRATION

Impacts	Significance Determinations
Impact 4.12-1: Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity during construction.	SU
Impact 4.12-2: Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during construction.	LSM
Impact 4.12-3: Expose people to or generate excessive groundborne vibration during construction.	LSM
Impact 4.12-4: Conflict with the construction time limits established by the local jurisdictions.	LSM
Impact 4.12-5: Result in a substantial permanent increase in ambient noise levels in the project vicinity during project operations.	LSM

TABLE 4.12-5 (Continued)
SUMMARY OF IMPACTS – NOISE AND VIBRATION

Impacts	Significance Determinations
Impact 4.12-6: Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during project operations.	LS
Impact 4.12-C: Cumulative impacts related to noise and vibration.	SU

NOTES:
LS = Less than Significant impact, no mitigation proposed
LSM = Less than Significant impact with Mitigation
SU = Significant and Unavoidable, even with implementation of mitigation

4.12.6.1 Construction Impacts

Impact 4.12-1: Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity during construction. (*Significant and Unavoidable, even with implementation of mitigation*)

Construction of the proposed facilities would occur over a 24-month period and would temporarily increase noise levels in the project vicinity. The noise levels generated during construction of each facility would vary, depending on the construction phase and the types of construction equipment being used.

Implementation of the subsurface slant wells, MPWSP Desalination Plant, and ASR-5 and ASR-6 Wells would require nighttime construction. The proposed pipelines and pump station would be constructed during daytime hours to the extent feasible. This analysis assumes that the ASR Recirculation Pipeline, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and some portions of the new Desalinated Water Pipeline and the new Transmission Main within the City of Marina and the City of Seaside would be constructed only during daytime hours (see **Mitigation Measure 12.4-4 (Nighttime Construction Restrictions in Marina)**; however, nighttime construction could be required for all other pipelines to meet the project schedule. All nighttime construction work would be conducted only with prior approval from the relevant jurisdictions. Pipeline installation would occur at a rate of approximately 150 to 250 feet per day.

The operation of trucks, backhoes, bulldozers, excavators, front-end loaders, compactors, scrapers, and other heavy-duty construction equipment would generate relatively high noise levels. These types of equipment would typically be operated for 1 or 2 minutes at full power followed by 3 to 4 minutes at lower power settings, compared to other equipment such as directional drill rigs, which tend to operate at a continuous power level.

Table 4.12-6 presents the maximum noise levels that would be heard at the sensitive receptors during operation of the loudest pieces of construction equipment. The table shows the existing ambient noise levels at sensitive receptors, the construction equipment noise levels at 50 feet, and the attenuated construction equipment noise levels at the distance from the receptors, and the

TABLE 4.12-6
SUMMARY OF NOISE LEVELS AT SENSITIVE RECEPTORS DURING CONSTRUCTION

Project Facility	Construction Equipment (Number of Pieces)	Equipment Noise Level at 50 feet (dBA L_{max})[a]	Distance from Nearest Sensitive Receptor (feet)	Attenuated Construction Equipment Noise Level at Nearest Sensitive Receptor (dBA L_{eq})[b]	Existing Ambient Noise Level at Nearest Sensitive Receptor (dBA L_{eq})[c]	Resultant Noise Level at Nearest Sensitive Receptor during Construction (dBA L_{eq})[d]	Exceeds Speech (70 dBA L_{eq}) or Sleep (60 dBA L_{eq}) Interference Thresholds?
Subsurface Slant Wells	Mobile Cranes (2) Bore/Drill Rigs (2)	81 82	4,000	N/A – Outside Study Area	N/A	N/A	N/A
MPWSP Desalination Plant	Mobile Cranes (2) Dozer (1) Dump Truck (1)	81 82 76	2,200	N/A – Outside Study Area	N/A	N/A	N/A
Pipeline Installation (Open Trench Construction)	Backhoe (1) Compactor (1) Mobile Crane (1)	78 83 81	50[e]	80.4	Daytime – 75.1 Nighttime – 56.8	88.2 88.0	Speech – YES Sleep – YES[f]
Pipeline Installation (Trenchless Construction)	Bore/Drill Rigs (1) Pile Driver (1)	84 101	50[e]	94.3	Daytime – 59.1 Nighttime – 45.8	94.3	Speech – YES Sleep – YES[f]
ASR-5 and ASR-6 Wells	Backhoe (1) Bore/Drill Rigs (1) Compactor	78 84 83	50	80.8	Daytime – 54.3 Nighttime – 52.0	80.8 80.8	Speech – YES Sleep – YES
Main System-Hidden Hills Interconnection Improvements	Backhoe (1) Dump Truck (1) Mobile Crane (1)	78 76 81	50	77.7	Daytime – 44.7	77.7	Speech – YES Sleep – n/a
Ryan Ranch-Bishop Interconnection Improvements	Backhoe (1) Dump Truck (1) Mobile Crane (1)	78 76 81	900	N/A – Outside Study Area	N/A	N/A	N/A
Carmel Valley Pump Station	Backhoe (1) Dump Truck (1) Mobile Crane (1)	78 76 81	50	77.7	Daytime – 61.5	77.9	Speech – YES Sleep – n/a

NOTES:

n/a = This facility would not involve nighttime construction; therefore, the sleep interference threshold does not apply.

a With the exception of noise levels for the drill rig for the subsurface slant wells, which are based on empirical monitoring conducted for CalAm's test slant well, reference noise levels for construction equipment are derived from FHWA, 2006.
b Attenuated construction equipment noise levels at the nearest sensitive receptors were calculated using FHWA Roadway Construction Noise Model Version 1.1. This value represents hourly average noise levels based on the estimated percentage of time the various pieces of construction equipment would be operating.
c Based on ambient noise levels at representative noise monitoring locations (see **Figure 4.12-1** and **Table 4.12-1**).
d Resultant noise level is the result of logarithmic addition of the values in the two previous columns (i.e., the attenuated noise from operation of all pieces of construction equipment in combination with ambient noise level at the sensitive receptor). This represents the noise level that could be experienced by a human at the sensitive receptor location.
e Distance between the proposed pipeline alignments and the nearest sensitive receptors varies by pipeline.
f Construction work hours would vary by pipeline; not all pipelines are anticipated to involve nighttime construction.

resultant noise levels at the residential receptors assuming all pieces of construction are operating simultaneously. The resultant noise level represents the maximum noise level that would be experienced by a person at the sensitive receptor location. As indicated in the table, at a distance of 50 feet from the construction work areas, individual pieces of non-impact construction equipment could generate noise levels as high as 84 dBA L_{max}. The attenuated construction equipment noise levels presented in **Table 4.12-6** are hourly average noise levels as calculated by the FHWA Roadway Construction Noise Model for the multiple pieces of equipment identified for each facility. Other construction-related noise would be brief and intermittent (e.g., placement of heavy equipment or materials into position, or the hydraulic movement of machinery lifts).

In addition to noise generated at the construction work areas, vehicle traffic related to materials and equipment deliveries, hauling of excess spoils, and construction worker commute trips would cause sporadic noise increases along project access routes. However, construction-related truck trips would be dispersed throughout the day and over the local road network and would not substantially increase noise, as these trips would only marginally increase traffic noise on the regional roadways (which already have relatively high traffic volumes). Impact 4.9-1 of Section 4.9 Traffic and Transportation identified construction-related traffic increases of no more than 2.8 percent. A doubling of traffic volumes would result in a 3-dBA increase in traffic noise levels which Caltrans characterizes as a barely perceptible increase in roadway noise. Because construction traffic would not double local traffic volumes, the increase in noise levels from construction-related vehicle trips would be minimal.

Subsurface Slant Wells

Up to 9 new subsurface slant wells[4] would be constructed in the CEMEX active mining area in northern Marina. Multiple slant wells would be constructed simultaneously, for a total of 15 months of slant well construction. Construction of the slant wells could occur anytime during the 24-month construction period and would occur 24 hours a day, 7 days a week.

The two closest sensitive receptors to the subsurface slant wells are residences at the Marina Dunes RV Park on Dunes Drive in Marina (4,000 feet to the south) and residences on Drew Street in Marina (4,300 feet to the southeast) and are beyond the 600 foot study area for noise from non-impact construction equipment (see Section 4.12.2) because construction-related noise increases at sensitive receptors would not exceed the speech interference threshold of 70 dBA, or exceed the sleep interference threshold of 60 dBA. Therefore, impacts related to nighttime noise level increases from slant well construction would be less than significant.

MPWSP Desalination Plant

Implementation of the proposed MPWSP Desalination Plant would involve the construction and installation of various structures and treatment facilities in an industrial and agricultural area of unincorporated Monterey County. The desalination facilities include a pretreatment system, a reverse osmosis system, a post-treatment system, pump station, storage tanks, pipelines, various

[4] The seawater intake system would include up to 10 permanent slant wells. As part of the proposed project, CalAm proposes to convert the test slant well into a permanent well and construct up to nine additional subsurface slant wells.

support structures, and buildings. Construction at the MPWSP Desalination Plant site on Charles Benson Road would occur over 24 months construction period and would require 24-hour construction.

The nearest sensitive receptors to the MPWSP Desalination Plant site are two rural residences on Neponset Road that are located 2,200 feet and 3,900 feet to the west, respectively which are beyond the 600 foot study area for noise from non-impact construction equipment (see Section 4.12.2) because construction-related noise increases at sensitive receptors would not exceed the speech interference threshold of 70 dBA, or exceed the sleep interference threshold of 60 dBA. Therefore, impacts related to nighttime noise level increases from construction activities at the MPWSP Desalination Plant site would be less than significant.

Pipelines North of Reservation Road

Under the proposed project, the following pipelines would be constructed north of Reservation Road: the Source Water Pipeline, new Desalinated Water Pipeline, Pipeline to the CSIP Pond, Brine Discharge Pipeline, and the Castroville Pipeline. To the extent feasible, pipelines would be installed during daytime hours. However, nighttime construction could be required at certain locations to meet the project schedule or avoid peak hour traffic impacts. CalAm would abide by local noise ordinances (including obtaining variances where needed) with regard to nighttime construction operations.

Table 4.12-7 presents the estimated resultant noise levels at the closest sensitive receptors during pipeline installation activities based on the anticipated construction method that would be used. Most pipelines would be installed using open trench construction methods. However, trenchless methods would be required at railroad crossings, river crossings, highway crossings, and other locations where open trench construction is not feasible.

As discussed in Section 4.12.5, Approach to Analysis, a significant construction noise impact would occur if noise levels at sensitive noise receptors remained above the 70 dBA speech interference threshold for longer than two consecutive weeks. Construction of the pipelines located north of Reservation Road would progress at a rate of approximately 250 feet per day, so the maximum noise levels at any one location would be limited to a period of 1 to 3 days. Thus, residential receptors would experience peak noise levels for less than the two week threshold.

Source Water Pipeline, Pipeline to the CSIP Pond, and Brine Discharge Pipeline

The residences on Neponset Road are the closest sensitive receptors to the Source Water Pipeline, Pipeline to the CSIP Pond, Brine Discharge Pipeline, and Brine Mixing Box. These receptors are located at a distance of 1,100 feet, 3,600 feet, 3,600 feet, and 5,800 feet from the proposed pipeline alignments, respectively, and are beyond the 600 foot study area for noise from non-impact construction equipment (see Section 4.12.2) because construction-related noise increases at sensitive receptors would not exceed the speech interference threshold of 70 dBA, or exceed the sleep interference threshold of 60 dBA. Therefore, impacts related to nighttime noise level increases from standard installation techniques of these pipelines would be less than significant. The Brine Mixing Box would not require nighttime installation.

TABLE 4.12-7
CONSTRUCTION NOISE LEVELS – PIPELINES NORTH OF RESERVATION ROAD

Pipeline (Construction Method)	Closest Sensitive Receptor(s)	Distance to Receptor (feet)	Existing Ambient Noise Level at Receptor(s) (dBA L_{eq})	Attenuated Construction Equipment Noise Level at Receptor(s) (dBA L_{eq})[a]	Resultant Noise Level at Receptor(s) during Construction (dBA L_{eq})[b]	Exceeds Day/nighttime threshold?
Source Water Pipeline (Open Trench Construction)	Residences on Neponset Road	1,100	N/A – Outside Study Area	N/A	N/A	N/A
Source Water Pipeline – (Trenchless Construction)	Residences on Neponset Road	3,500	N/A – Outside Study Area	N/A	N/A	N/A
New Desalinated Water Pipeline (Open Trench Construction)	Residences on Marina Drive	100	Daytime – 66.4[d] Nighttime – 42.3	74.0	Daytime – 74.7 Nighttime – 74.0	Yes/Yes
New Desalinated Water Pipeline (Trenchless Construction)	Residences on Marina Drive	100	Daytime – 66.4[d]	87.8	Daytime – 87.8	Yes/NA
Pipeline to the CSIP Pond and Brine Discharge Pipeline (Open Trench Construction)	Residences on Neponset Road	3,600	N/A – Outside Study Area	N/A	N/A	N/A
Castroville Pipeline (Open Trench Construction)	Residence on Monte Road	200	Daytime – 75.1[e] Nighttime – 56.8	68.0	Daytime – 75.9 Nighttime – 68.3	Yes/Yes
Castroville Pipeline Optional Alignment 1 (Open Trench Construction)	Residences on Cypress Circle and Merritt Way	30	Daytime – 75.5[f] Nighttime – 62.5	84.5	Daytime – 85.0 Nighttime – 84.5	Yes/Yes
Castroville Pipeline (Trenchless Construction)	Residence on Castroville Road near Salinas River crossing	800	Daytime – 75.5[f]	69.7	Daytime – 76.5	Yes/NA

NOTES:
a Attenuated construction equipment noise levels at the nearest sensitive receptors were calculated using FHWA Roadway Construction Noise Model Version 1.1. This value represents hourly average noise levels based on the estimated percentage of time the various pieces of construction equipment would be operating.
b Resultant noise level is the result of logarithmic addition of the values in the two previous columns (i.e., the attenuated construction equipment noise in combination with the ambient noise level at the sensitive receptor). This represents the noise level that could be experienced by a human at the sensitive receptor location.
c Based on daytime and nighttime ambient noise level at short-term noise monitoring location S1 (see **Figure 4.12-1** and **Table 4.12-1**).
d Based on daytime and nighttime ambient noise level at short-term noise monitoring location S2.
f Based on peak hour traffic modeling and Caltrans traffic volumes for daytime. Nighttime assumes 5% of peak hour traffic.

Approximately 500 feet east of Highway 1, the Source Water Pipeline would veer northeast along a dirt path for roughly 1,000 feet to Lapis Road. At this location, a jack and bore method would be applied to install the pipeline under the existing railroad tracks 3,500 feet from the nearest receptors, which is beyond the 1,800 foot study area for noise from impact construction equipment (see Section 4.12.2) because construction-related noise increases at sensitive receptors would not exceed the speech interference threshold of 70 dBA, or exceed the sleep interference threshold of 60 dBA noise impacts associated with construction of these pipelines would be less than significant.

New Desalinated Water Pipeline

Residences on Marina Drive are as close as 100 feet from the proposed new Desalinated Water Pipeline alignment. The existing daytime ambient noise level at residences on Cosky Road (noise monitoring location S2) was monitored at 66.4 dBA L_{eq}. Based on proximity and existing land uses of the two receptors, the ambient noise level at the Cosky Road residences is considered to be representative of the ambient noise level at residences at Marina Drive. The resultant noise levels associated with pipeline installation at the Marina Drive residences could be as high as 74.7 dBA L_{eq} (see **Table 4.12-7**). Speech interference becomes pronounced at levels in excess of 70 dBA.

Construction of the new Desalinated Water Pipeline is estimated to progress at a rate of approximately 250 feet per day, so the maximum noise levels at any one location would be limited to a period of 1 to 3 days. Consequently, although construction noise at adjacent residences could exceed the speech interference threshold of 70 dBA, the duration of the impact at any given sensitive noise receptor would be less than two weeks. Therefore, the construction noise impact associated with increases in daytime noise levels would be less than significant.

If nighttime work were to be conducted along the portion of the new Desalinated Water Pipeline in Marina, noise from construction equipment could exceed the sleep interference threshold of 60 dBA, a significant impact. Implementation of **Mitigation Measures 4.12-1a (Neighborhood Notice)**, **4.12-1b (General Noise Controls for Construction Equipment)**, and **4.12-1c (Noise Control Plan for Nighttime Pipeline Construction)** would reduce the severity of this impact below the sleep interference threshold of 60 dBA, L_{eq} (14 dBA of reduction).

Mitigation Measure 4.12-1a (Neighborhood Notice) would require that CalAm provide advanced notice to affected receptors which, although does not reduce noise levels, allows affected receptors to avoid peak noise impact periods if possible. **Mitigation Measure 4.12-1b (General Noise Controls for Construction Equipment)** requires muffled exhaust systems on all combustion engines, external jackets on impact tools, and the use of temporary noise barriers. **Mitigation Measure 4.12-1c (Noise Control Plan for Nighttime Pipeline Construction)** would require the use of noise barriers or other noise-attenuating measures. Moveable sound barrier curtains can provide 15 dBA of sound attenuation (INC, 2014). The duration of this significant nighttime noise impact would be limited to 1 to 3 days at any given sensitive receptor. With implementation of feasible mitigation measures, the nighttime noise impact would be reduced to a less-than-significant level by requiring barriers or other measures that would reduce the resultant noise level below the sleep interference threshold of 60 dBA, L_{eq}.

On some portions of the new Desalinated Water Pipeline where it is not feasible or desirable to perform open-cut trenching, trenchless methods such as jack-and-bore, drill-and-burst, horizontal directional drilling, and/or microtunneling could be employed. Such work typically requires excavation and shoring of the jacking and receiving pits by using impact or vibratory sheet pile drivers that would operate only during daytime hours. Jack-and-bore methods would also be used for pipeline segments that cross beneath Highway 1 or drainages. Should this method be used for the new Desalinated Water Pipeline, localized noise levels would be substantially increased (up to 88 dBA, L_{eq} at 100 feet) during installation of sheet piles. The duration of this potential daytime noise impact would be limited to 1 to 3 days at any given sensitive receptor and therefore, the impact would be less than significant.

Castroville Pipeline

From the MPWSP Desalination Plant, the Castroville Pipeline would head west along Charles Benson Road to Del Monte Boulevard, at which point the pipeline would head north along Del Monte Boulevard to Lapis Road and along the west side of Lapis Road within the Monterey TAMC right-of-way. The pipeline would cross beneath the Salinas River Bridge to Nashua Road and continue north along the Union Pacific railroad tracks and the agricultural road to Highway 183. From Highway 183 the alignment would continue north, turn west across Del Monte Avenue and connect to CCSD Well #3 at the north corner of Del Monte Avenue and Merritt Street. The Castroville Pipeline alignment is within 20 feet of a single cluster of rural residential residences at the northern end of the Salinas River Bridge.

The existing daytime ambient noise level at the driveway of the rural residences on Monte Road on the northern site of the Salinas River (noise monitoring location S9) was monitored at 75.1 dBA L_{eq}. The resultant noise levels associated with pipeline installation at the Salinas River residences could be as high as 75.9 dBA L_{eq} (see **Table 4.12-7**).

Construction of the Castroville Pipeline is estimated to progress at a rate of approximately 250 feet per day, so the maximum noise levels at any one location would be limited to a period of 1 to 3 days. Consequently, the construction noise impact associated with increases in daytime noise levels would be less than significant.

If nighttime work were required for installation of the Castroville Pipeline, noise from construction equipment could exceed the sleep interference threshold of 60 dBA at the one portion within 200 feet of the Monte Road residence north of the Salinas River, a significant impact. Implementation of **Mitigation Measures 4.12-1a (Neighborhood Notice), 4.12-1b (General Noise Controls for Construction Equipment)**, and **4.12-1c (Noise Control Plan for Nighttime Pipeline Construction)** would reduce the severity of this impact below the sleep interference threshold of 60 dBA, L_{eq} (9 dBA of reduction).

The Castroville Pipeline would be installed beneath the Salinas River and Tembladero Slough using trenchless construction methods. Trenchless construction typically requires excavation and shoring of an entry pit and a receiving pit using impact or vibratory sheet pile drivers. Localized noise levels would be substantially increased (up to 88 dBA, L_{eq} at 100 feet) during installation of sheet piles. At the Salinas River crossing, these pits are approximately 800 feet from sensitive receptors on the north side of the Salinas River. At this distance, the noise from sheet pile driving would be 70 dBA, L_{eq} and would be less than significant.

The proposed Tembladero Slough entry and receiving pits are approximately 430 feet from sensitive residential receptors on Castroville Road. At this distance, noise from sheet pile driving during the day (no nighttime sheet pile driving is proposed) would exceed the speech interference threshold of 70 dBA, but would be less than significant because these noise levels would be limited to a period of 1 to 3 days at any one location.

Castroville Pipeline Optional Alignment 1

This alignment is within 30 feet of residential dwellings on Cypress Circle and Merritt Way. Because the existing daytime ambient noise level at these residences is 75.5 dBA L_{eq} the resultant noise levels associated with pipeline installation along Merritt Street could be as high as 85 dBA L_{eq} (see **Table 4.12-7**). However, because the duration of the impact at these sensitive noise receptors would be less than the two week threshold, the noise levels would result in a less than significant impact.

If nighttime work were to be conducted along the portion of the Castroville Pipeline Optional Alignment 1, the resultant noise level could be as high as 84.5 dBA and exceed the sleep interference threshold of 60 dBA for 1 to 3 days at locations within 200 feet of the pipeline such as residences on Cypress Circle and Merritt Way, a significant impact. Implementation of **Mitigation Measures 4.12-1a (Neighborhood Notice)**, **4.12-1b (General Noise Controls for Construction Equipment**), and 4.12-1c (Noise Control Plan for Nighttime Pipeline Construction) would reduce the severity of this impact (16 dBA of reduction), but not to the degree necessary to reduce construction noise below the threshold of 60 dBA, L_{eq} (25 dBA of reduction). Moveable sound barrier curtains can provide 15 dBA of sound attenuation (INC, 2014). Consequently, although the impact at any given receptor would be limited in duration, the impact would remain significant and unavoidable even with implementation of mitigation measures.

New Transmission Main

The new Transmission Main passes within 100 feet of residences located on Marina Drive in the city of Marina. Short-term monitoring at location S2, where the ambient daytime noise level was measured at 66.4 dBA L_{eq} and the ambient nighttime noise level was measured at 42.3 dBA L_{eq}, represents the noise environment at the closest residential receptors to the new Transmission Main (see **Table 4.12-8** and **Figure 4.12-1**). The resultant daytime construction noise level at these receptors could be as high as 74.7 dBA. The impact associated with construction-related increases in daytime noise levels would be less than significant because the impact duration would be less than the two week threshold.

Two options for crossing Highway 1 are considered. Under both the preferred alignment and the new Transmission Main Optional Alignment, the pipeline would be installed beneath Highway 1 using trenchless construction methods. The nearest sensitive receptors are located over 1,300 feet away from the trenchless pit locations. At this distance the resultant noise level would be less than 70 dBA and would be less than significant.

TABLE 4.12-8
MAXIMUM CONSTRUCTION NOISE LEVELS – NEW TRANSMISSION MAIN

Pipeline (Construction Method)	Closest Sensitive Receptor(s)	Distance to Receptor (feet)[a]	Existing Ambient Daytime Noise Level at Receptor(s) (dBA L_{eq})	Attenuated Construction Equipment Noise Level at Receptor(s) (dBA L_{eq})[a]	Resultant Noise Level at Receptor(s) during Construction (dBA L_{eq})[b]	Exceeds Day/ nighttime Threshold?
New Transmission Main (Open Trench Construction)	Residences (various)	100	Daytime – 66.4[c] Nighttime – 42.3	74.0	Daytime – 74.7 Nighttime – 74.0	Yes/Yes
		180	Daytime – 50.1[d] Nighttime – 51.4	68.9	Daytime – 69.5 Nighttime –69.5	No/Yes
New Transmission Main (Trenchless Construction)	Residences on Marina Drive	100	Daytime – 66.4[c]	87.8	87.8	Yes/NA

NOTES:
[a] Attenuated construction equipment noise levels at the nearest sensitive receptors were calculated using FHWA Roadway Construction Noise Model Version 1.1. This value represents hourly average noise levels based on the estimated percentage of time the various pieces of construction equipment would be operating.
[b] Resultant noise level is the result of logarithmic addition of the values in the two previous columns (i.e., the attenuated construction equipment noise in combination with the ambient noise level at the sensitive receptor). This represents the noise level that could be experienced by a human at the sensitive receptor location.
[c] Based on daytime and nighttime ambient noise level at short-term noise monitoring location S2 (see **Figure 4.12-1** and **Table 4.12-1**).
[d] Based on daytime ambient noise level at short-term noise monitoring location S10.

If needed, nighttime construction for the new Transmission Main would be limited to areas outside of the City of Marina and the City of Seaside (Mitigation Measure 4.12-4 prohibits nighttime construction work within 500 feet of residences in the City of Marina). The closest residential receptors are on 4th Army Street at a distance of 250 feet and the resultant nighttime noise levels at these residences receptors could be as high as 69.5 dBA, L_{eq}, which would exceed the sleep interference threshold of 60 dBA. Implementation of **Mitigation Measures 4.12-1a (Neighborhood Notice)**, **4.12-1b (General Noise Controls for Construction Equipment)**, and **4.12-1c (Noise Control Plan for Nighttime Pipeline Construction)** would reduce the severity of this impact, to below the sleep interference threshold of 60 dBA, L_{eq} (10 dBA of reduction).

ASR-5 and ASR-6 Wells

The proposed ASR injection/extraction wells (ASR-5 and ASR-6 Wells) would be constructed at the intersection of General Jim Moore Boulevard and Ardennes Circle, in the Fitch Park military housing area. The closest residential receptors to the proposed wells are located 50 feet away on Ardennes Circle. Noise monitoring location S4 represents the noise environment at the Fitch Park residential receptors (see **Table 4.12-1** and **Figure 4.12-1**).

Each proposed ASR injection/extraction well would require 24-hour construction activities for up to 4 weeks during well drilling and development, for a total of 8 weeks of 24-hour construction. As discussed in Section 3.3.2.2 in Chapter 3, Description of the Proposed Project, temporary noise attenuators (sound walls) would be installed at each well site to reduce construction noise. Accounting for the attenuation provided by the temporary sound wall, the resultant daytime and nighttime construction noise levels at the Fitch Park residential receptors could be as high as 80.8 dBA L_{eq}. This level exceeds the speech interference and sleep interference thresholds of 70 dBA and 60 dBA (with windows closed, or 35 dBA with windows open), respectively, and would result in a significant impact. **Figures 4.12-2** and **4.12-4** illustrate the noise contours for construction of ASR-5 and ASR-6 wells, respectively, without mitigation. While it is possible that implementation of **Mitigation Measures 4.12-1a (Neighborhood Notice)**, **4.12-1b (General Noise Controls for Construction Equipment)**, **4.12-1d (Additional Noise Controls for ASR-5 and ASR-6 Wells)**, and **4.12-1e (Offsite Accommodations for Substantially Affected Receptors)** would reduce the daytime noise impact to a less-than-significant level, this mitigation would not be sufficient to reduce noise to below the more stringent nighttime threshold. The maximum level of attenuation that is reasonably achievable with implementation of the mitigation measures is 16 to 40 dBA of sound reduction, depending on the frequency of the noise source (ENC, 2014). **Figures 4.12-3** and **4.12-5** illustrate the noise contours for construction of ASR-5 and ASR-6 wells, respectively, with mitigation. The nighttime noise impact would remain significant and unavoidable.

ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline

The three 0.9-mile-long ASR pipelines would be installed along General Jim Moore Boulevard between the ASR-5 and ASR-6 Wells and Coe Avenue. Nighttime construction work is not proposed for these pipelines; therefore, there would be no impact related to nighttime noise increases.

The pipelines would be installed as close as 300 feet east of Seaside Middle School. The attenuated construction equipment noise level at 300 feet would be 65.2 dBA L_{eq} (see **Table 4.12-9**). However, because the school is situated at a lower elevation than General Jim Moore Boulevard, the effective earthen berm created by the difference in elevation would shield the school and provide an additional 15 to 20 dBA of noise attenuation (Caltrans, 2009). Consequently, the resultant daytime noise level at Seaside Middle School during pipeline installation activities would be 50.2 dBA L_{eq} and would be less than significant.

These pipeline alignments are as close as 100 feet from residential receptors, including residences on Ardennes Circle. The resultant daytime noise level at residential receptors during pipeline construction would be as high as 74.0 dBA L_{eq}. Assuming a pipeline installation rate of 250 feet per day, these residential receptors would be exposed to the 74.0-dBA noise levels for 1 to 3 days. Therefore, the construction noise impact associated with increases in daytime noise levels from pipeline installation would be less than significant.

SOURCE: ESA, 2017

205335.01 Monterey Peninsula Water Supply Project

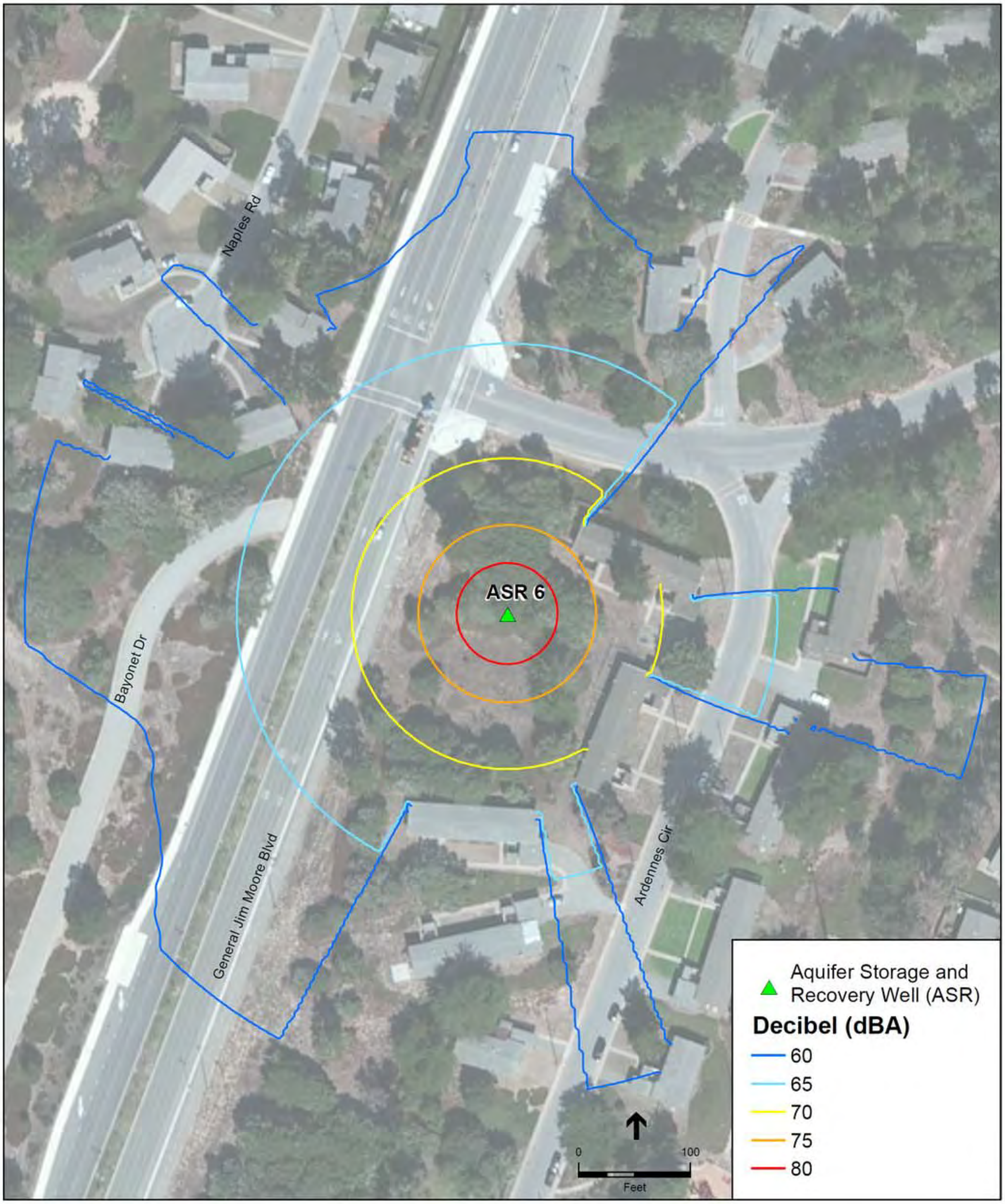
Figure 4.12-2
Construction Noise Contours for Well ASR-5

SOURCE: ESA, 2017

205335.01 Monterey Peninsula Water Supply Project

Figure 4.12-3

Construction Noise Contours for Well ASR-5 with10-foot barrier



SOURCE: ESA, 2017

205335.01 Monterey Peninsula Water Supply Project

Figure 4.12-4

Construction Noise Contours for Well ASR-6

SOURCE: ESA, 2017

205335.01 Monterey Peninsula Water Supply Project

Figure 4.12-5

Construction Noise Contours for Well ASR-6 with 15-foot barrier

TABLE 4.12-9
MAXIMUM CONSTRUCTION NOISE LEVELS – ASR PIPELINES

Project Component	Closest Sensitive Receptor(s)	Distance to Receptor (feet)	Existing Ambient Noise Level at Receptor(s) (dBA L_{eq})	Attenuated Construction Equipment Noise Level at Receptor(s) (dBA L_{eq})[a]	Resultant Noise Level at Receptor(s) during Construction (dBA L_{eq})[b]	Exceeds Daytime Threshold?
ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline and ASR Recirculation Pipeline (Open Trench Construction)	Residences at Fitch Park military housing area (Ardennes Circle)	100	Daytime – 54.3[c]	74.0	Daytime – 74.0	Yes
ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline and ASR Recirculation Pipeline (Open Trench Construction)	Seaside Middle School	300	Daytime – 50.7[c]	50.2	Daytime – 53.5	Yes

NOTES:
[a] Attenuated construction equipment noise levels at the nearest sensitive receptors were calculated using FHWA Roadway Construction Noise Model Version 1.1. This value represents hourly average noise levels based on the estimated percentage of time the various pieces of construction equipment would be operating.
[b] Resultant noise level is the result of logarithmic addition of the values in the two previous columns (i.e., the attenuated construction equipment noise in combination with the ambient noise level at the sensitive receptor). This represents the noise level that could be experienced by a human at the sensitive receptor location.
[c] Based on daytime and nighttime ambient noise level at short-term noise monitoring location S4 (see **Figure 4.12-1** and **Table 4.12-1**).
[d] Estimated noise levels during well drilling and development do not reflect the noise attenuation provided by sound walls.

Carmel Valley Pump Station

Construction activities for the Carmel Valley Pump Station are expected to last for approximately 6 months and would occur during daytime hours only. The closest residence is located approximately 50 feet to the north and east of the pump station site. Noise measurements taken at monitoring location S7 (see **Figure 4.12-1**) represent the noise environment at this sensitive receptor (61.5dBA L_{eq}). As shown in **Table 4.12-6**, during construction, the resultant daytime noise level at this sensitive receptor could be as high as 77.9 dBA, L_{eq}, which is a significant impact. However, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.12-1a (Neighborhood Notice)** and **4.12-1b (General Noise Controls for Construction Equipment)**.

Interconnections with Highway 68 Satellite Water Systems

The proposed project would improve existing interconnections for three satellite water systems in the unincorporated communities of Ryan Ranch, Bishop, and Hidden Hills along the Highway 68 corridor. These improvements would be constructed during daytime hours and would not involve nighttime construction.

Ryan Ranch–Bishop Interconnection Improvements

The Ryan Ranch–Bishop Interconnection Improvements would be located in a business park area (i.e., medical offices and general office space). The closest noise-sensitive land use is the York School located 900 feet to the northeast of the proposed improvements on York Road, which is beyond the 600 foot study area for noise from non-impact construction equipment (see **Section 4.12.2**) because construction-related noise increases at sensitive receptors would not exceed the speech interference threshold of 70 dBA, or exceed the sleep interference threshold of 60 dBA. Therefore, the impact related to temporary increases in daytime noise levels would be less than significant.

Main System–Hidden Hills Interconnection Improvements

The proposed Main System–Hidden Hills Interconnection Improvements involve the installation of a 1,200-foot-long, 6-inch-diameter pipeline along Tierra Grande Drive. This is a rural residential area where daytime noise levels are typically below 50 dBA. The pipeline and valves would be installed over approximately 5 days. Assuming a distance of 50 feet from the nearest residence, the resultant daytime noise levels at the closest residence could be as high as 77.7 dBA L_{eq}, which would exceed the 70-dBA L_{eq} threshold. Although daytime construction noise at adjacent residences could exceed the threshold of 70 dBA L_{eq}, the duration of the impact would be less than two weeks and the impact would be less than significant.

Impact Conclusion

Construction of the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline, Pipeline to the CSIP Pond, Brine Discharge Pipeline, and Brine Mixing Box would result in less-than-significant daytime and nighttime noise impacts. Construction of the ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, Main System-Hidden Hills Interconnection Improvements, and Ryan Ranch-Bishop Interconnection Improvements would result in a less-than-significant impact related to temporary increases in daytime noise levels and no impact related to nighttime noise. Significant impacts related to temporary increases in daytime noise levels would result during construction of the ASR-5 and ASR-6 Wells and the Carmel Valley Pump Station, but these impacts would be reduced to less-than-significant levels with implementation of the prescribed mitigation measures. Significant nighttime noise impacts would result during construction of the new Desalinated Water Pipeline, Castroville Pipeline, new Transmission Main, and the ASR-5 and ASR-6 Wells. With the exception of nighttime noise impacts associated with the Castroville Pipeline Optional Alignment 1 and ASR-5 and ASR-6 Wells, implementation of **Mitigation Measures 4.12-1a** through **4.12-1c** would reduce all other construction-related nighttime noise impacts to a less-than-significant level. Nighttime noise impacts during installation of the Castroville Pipeline Optional Alignment 1 and during drilling and development of the ASR-5 and ASR-6 Wells would remain significant and unavoidable, even with implementation of mitigation.

Mitigation Measures

Mitigation Measure 4.12-1a applies to the new Desalinated Water Pipeline, Castroville Pipeline and Optional Alignment, new Transmission Main, ASR-5 and ASR-6 Wells, and Carmel Valley Pump Station.

Mitigation Measure 4.12-1a: Neighborhood Notice and Construction Disturbance Coordinator

The combination of public notice and the establishment of a construction disturbance coordinator can result in a lessening of the adversity of the impact at a given receptor by allowing them to prepare for pending construction activities and providing a contact to report any disturbances or violations to CalAm for appropriate response actions, including additional mitigation. Residents and other sensitive receptors within 300 feet of a daytime construction area and within 900 feet of a nighttime construction area shall be notified of the construction location, nature of activities, and schedule, in writing, at least 14 days prior to the commencement of construction activities. The notice shall also be posted along the proposed pipeline alignments, near the proposed facility sites, and at nearby recreational facilities. CalAm or the contractor(s) shall designate a construction disturbance coordinator who would be responsible for responding to construction complaints. The coordinator shall determine the cause of the complaint and ensure that reasonable measures are implemented to correct the problem. CalAm and/or its contractor shall return all calls within 24 hours to answer noise questions and handle complaints. Documentation of the complaint and resolution shall be submitted to the CPUC weekly. A contact number for the construction disturbance coordinator shall be conspicuously placed on construction site fences and included in the notice. Prior to distributing the notice to nearby residences, CalAm or the contractor(s) shall first submit the notice to the respective city planning and services manager for review and approval. This measure shall be implemented in conjunction with the noticing provisions in Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan).

Mitigation Measure 4.12-1b applies to the new Desalinated Water Pipeline, Castroville Pipeline Optional Alignment, new Transmission Main, ASR-5 and ASR-6 Wells, and Carmel Valley Pump Station.

Mitigation Measure 4.12-1b: General Noise Controls for Construction Equipment and Activities.

The construction contractor(s) shall assure that construction equipment with internal combustion engines have sound control devices at least as effective as those provided by the original equipment manufacturer. No equipment shall be permitted to have an unmuffled exhaust.

Impact tools (i.e., jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler shall be placed on the compressed air exhaust to lower noise levels by up to approximately 10 dBA. External jackets shall be used on impact tools, where feasible, in order to achieve a further reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment, whenever feasible.

The construction contractor(s) shall locate staging areas and stationary noise sources as far from nearby receptors as possible, and shall muffle and enclose them in temporary sheds, incorporate noise barriers, or implement other noise control measures to the extent feasible. The noise controls shall be sufficient to reduce noise levels during drilling and development of ASR-5 and ASR-6 Wells, and pump station construction activities below the threshold of 70 dBA L_{eq}.

Mitigation Measure 4.12-1c applies to the new Desalinated Water Pipeline, Castroville Pipeline and Optional Alignment, and new Transmission Main.

Mitigation Measure 4.12-1c: Noise Control Plan for Nighttime Pipeline Construction.

CalAm or a representative of CalAm shall submit a Noise Control Plan for all nighttime pipeline work to the California Public Utilities Commission for review and approval prior to the commencement of project construction activities. The Noise Control Plan shall identify all feasible noise control procedures to be implemented during nighttime pipeline installation in order to reduce noise levels to the extent practicable at the nearest residential or noise sensitive receptor. At a minimum, the Noise Control Plan shall require use of moveable noise screens, noise blankets, or other suitable sound attenuation devices be used to reduce noise levels during nighttime pipeline installation activities below 60 dBA L_{eq}.

Mitigation Measure 4.12-1d applies only to the ASR-5 and ASR-6 Wells.

Mitigation Measure 4.12-1d: Additional Noise Controls for ASR-5 and ASR-6 Wells.

In addition to the general noise controls that will be implemented as part of Mitigation Measure 4.12-1b (General Noise Controls for Construction Equipment), CalAm or its construction contractor(s) for the ASR-5 and ASR-6 Wells shall identify feasible noise controls for implementation during well drilling development activities at the Fitch Park military housing community. The construction contractor(s) shall locate all stationary noise-generating equipment as far as possible from nearby noise-sensitive receptors. Drill rigs within 500 feet of noise-sensitive receptors shall be equipped with noise-reducing engine housings or other noise-reducing technology. Additionally, acoustic barriers and/or enclosures shall be used with a goal of reducing noise from well drilling activities to 60 dBA, L_{eq} or less at a distance of 50 feet from the construction work area. There are a number of options available to achieve this performance standard. Barrier blankets are available with a sound transmission class rating of 32, which can provide 16 to 40 dBA of sound transmission loss, depending on the frequency of the noise source (ENC, 2014). The realized sound transmission reduction of barrier blankets needs to be sufficient to achieve the performance standard of 60 dBA, L_{eq} or less at a distance of 50 feet from the construction work area.

Mitigation Measure 4.12-1e applies only to the ASR-5 and ASR-6 Wells.

Mitigation Measure 4.12-1e: Offsite Accommodations for Substantially Affected Nighttime Receptors.

CalAm shall provide temporary hotel accommodations for all residences and any other nighttime sensitive receptors:

1. That would be exposed to 24-hour project construction activities and

2. Where nighttime construction noise would exceed 60 dBA with windows closed or 35 dBA with windows open, even with implementation of acoustic barriers and/or shielding measures.

The accommodations shall be provided for the duration of 24-hour construction activities. CalAm shall provide accommodations reasonably similar to those of the impacted residents in terms of number of beds and amenities. If identified accommodations do not include typical residential kitchen facilities (e.g., cooktop, oven, full size refrigerator), then CalAm shall provide displaced individuals with a per diem allowance to offset costs of meals for the period of relocation.

Impact 4.12-2: Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during construction. (*Less than Significant with Mitigation*)

Subsurface Slant Wells

Section 15.04.055 of the Marina Municipal Code limits outside construction, repair work, or related activities that produce noise adjacent to residential uses and restricts construction noise to 60 dBA for 25 percent of an hour at the property line of sensitive receptors. As shown in **Table 4.12-3**, nighttime construction of the subsurface slant wells and the Source Water Pipeline would not occur adjacent to a residential use. Consequently, construction of the proposed slant wells would have a less than significant impact with regard to generation of noise levels in excess of standards.

MPWSP Desalination Plant

The residences on Neponset Road are located in unincorporated Monterey County and subject to the *Monterey County General Plan*. As indicated in Table 4.12-3, the only policy or ordinance for which the proposed MPWSP Desalination Plant would be potentially inconsistent is Policy S-7.10 of the Monterey County General Plan. Policy S-7.10 applies the following standard noise protection measures:

- Construction shall occur only during times allowed by ordinance/code unless such limits are waived for public convenience;
- All equipment shall have properly operating mufflers; and
- Laydown yards and semi-stationary equipment such as pumps or generators shall be located as far from noise-sensitive land uses as practical

Construction of the MPWSP Desalination Plant facilities would operate equipment and require staging areas. However, implementation of **Mitigation Measure 4.12-1b (General Noise Controls for Construction Equipment and Activities)** addresses these policy-driven mitigation measures by prohibiting equipment with unmuffled exhaust and requiring that staging areas and stationary noise sources be located as far from nearby receptors as possible.

Therefore, the impact of construction noise from the MPWSP Desalination Plant related to generation of noise in excess of regulatory noise standards would be less than significant.

Pipelines North of Reservation Road

Source Water Pipeline, Pipeline to the CSIP Pond, Brine Discharge Pipeline, and Brine Mixing Box

The closest sensitive receptors to the Source Water Pipeline, Pipeline to the CSIP Pond, Brine Discharge Pipeline, and Brine Mixing Box are residences on Neponset Road in unincorporated Monterey County. These pipelines could require nighttime construction, but the Brine Mixing Box would only be constructed during daytime hours. Construction of these pipelines would be subject to the *Monterey County General Plan*. Monterey County General Plan Policy S-7.9 restricts evening construction activities within 500 feet of a sensitive land use. As discussed above under Impact 4.12-1, the residences on Neponset Road are the closest sensitive receptors to the Source Water Pipeline, Pipeline to the CSIP Pond, Brine Discharge Pipeline, and Brine Mixing Box at 1,100 feet, 3,600 feet, 3,600 feet, and 5,800 feet respectively, which are all greater than 500 feet away from proposed pipeline construction areas. Therefore, such construction activities would be consistent with Policy S-7.9.

Monterey County Code Section 10.60.030 limits the operation of machinery or equipment that produces a noise level exceeding 85 dBA at 50 feet from the source. The equipment used to install the Source Water Pipeline, Pipeline to the CSIP Pond, Brine Discharge Pipeline, and Brine Mixing Box (see **Table 4.12-6**) would not exceed these levels.

Portions of the Source Water Pipeline would be within the jurisdiction of the City of Marina. The City of Marina Municipal Code restricts construction noise to 60 dBA for 25 percent of an hour at any receiving property line. There are no residences or other sensitive receptors located within the study area for the Source Water Pipeline (see **Table 4.12-7**). This would be a less than significant impact with regard to the generation of noise in excess of regulatory noise standards in the city of Marina.

Consequently, construction activities associated with the installation of the Source Water Pipeline, Pipeline to the CSIP Pond, Brine Discharge Pipeline, and Brine Mixing Box would be consistent with standards established in the applicable general plans and noise ordinances. Therefore, construction noise from installation of these pipelines related to generation of noise in excess of regulatory noise standards would be less than significant.

New Desalinated Water Pipeline

Construction of this pipeline would be subject to the *Monterey County General Plan*. Monterey County General Plan Policy S-7.9 restricts construction activities within 500 feet of a sensitive land use during evening hours. There are no residences within unincorporated Monterey County that are within 500 feet of the new Desalinated Water Pipeline and construction activities would be consistent with Policy S-7.9.

As indicated in Table 4.12-3, all project elements in Monterey County would be consistent with Monterey County Code Section 10.60.030 which limits the operation of machinery or equipment that produces a noise level exceeding 85 dBA at 50 feet from the source.

The Noise Element of the *City of Marina General Plan* does not address construction noise. The Municipal Code restricts construction noise to 60 dBA for 25 percent of an hour at any receiving property line. The daytime and nighttime resultant noise levels associated with pipeline installation at the Marina Drive residences could be as high as 74.7 and 74.0 dBA L_{eq}, respectively (see **Table 4.12-7**). This would be a significant impact with regard to generation of noise in excess of regulatory noise standards. However, with implementation of **Mitigation Measures 4.12-1b (General Noise Controls for Construction Equipment)** and **4.12-1c (Noise Control Plan for Nighttime Pipeline Construction)**, which would require that construction contractor's implement noise control measures, including temporary sound enclosures, if necessary, would reduce the resultant daytime and nighttime noise levels below 60 dBA. Moveable sound barrier curtains can provide 15 dBA of sound attenuation (INC, 2014) reducing resultant noise levels to 59.7 dBA which is below the nighttime sleep interference threshold. These mitigation measures would reduce the impact to a less-than-significant level. Additionally, Mitigation Measure 4.12-4 prohibits nighttime construction work within 500 feet of residences in the City of Marina, further reducing the potential nighttime construction noise impact.

Trenchless construction methods would be required to install the new Desalinated Water Pipeline beneath railroad tracks. The resultant noise levels would be up to 96 dBA, L_{eq} at a distance of 50 feet during installation of sheet piles. Monterey County Code Section 10.60.030 limits the operation of machinery or equipment that produces a noise level exceeding 85 dBA at 50 feet from the source. If sheet piles were required, the equipment used to install them would exceed these levels. However, implementation of **Mitigation Measure 4.12-1b (General Noise Controls for Construction Equipment)** would provide 15 dBA of sound attenuation (INC, 2014), which would be sufficient to reduce the impact of sheet pile driving to less than the 85 dBA threshold of the Monterey County Code.

The City of Marina Municipal Code restricts construction noise to 60 dBA for 25 percent of an hour at any receiving property line. The Roadway Construction Noise Model identifies pile driving as having a usage percentage of 20 percent of an hour. Consequently, pile driving noise would be exempt from the restrictions of the City's municipal Code.

Castroville Pipeline

The Castroville Pipeline would be installed along rural roadways in unincorporated Monterey County. Construction of this pipeline would be subject to the *Monterey County General Plan*. Monterey County General Plan Policy S-7.9 restricts construction activities within 500 feet of a sensitive land use during evening hours. There is a cluster of residences within unincorporated Monterey County that are within 500 feet of the Castroville Pipeline on the north side of the Salinas River as well as one at Nashua Road. Policy S-7.9 requires the project sponsor to complete a noise mitigation study if construction noise would exceed the "acceptable" levels listed in Policy S-7.1 within 500 feet of a noise-sensitive land use during evening hours.

Therefore, nighttime construction work of the Castroville Pipeline would be a significant impact with regard to generation of noise in excess of regulatory noise standards. However, implementation of **Mitigation Measures 4.12-1c (Noise Control Plan for Nighttime Pipeline Construction)** would ensure that construction activities would be consistent with Policy S-7.9 and a less-than-significant impact with respect to consistency with local plans.

The Castroville Pipeline Optional Alignment 1 would be installed within 500 feet of two residences on Nashua Road as well as dozens of residences along either side Merritt Street (On Merritt Way and Cypress Circle) within the unincorporated town of Castroville. Similarly, implementation of **Mitigation Measures 4.12-1c (Noise Control Plan for Nighttime Pipeline Construction)** would ensure that construction activities would be consistent with Policy S-7.9 and a less-than-significant impact with respect to consistency with local plans.

As indicated in Table 4.12-3, all project elements in Monterey County would be consistent with Monterey County Code Section 10.60.030 which limits the operation of machinery or equipment that produces a noise level exceeding 85 dBA at 50 feet from the source. Consequently, construction activities associated with the installation of the Castroville Pipeline would be consistent with standards established in the applicable general plan and noise ordinance and construction noise from installation of these pipelines related to generation of noise in excess of regulatory noise standards would be less than significant.

Pipelines South of Reservation Road

New Transmission Main

The northernmost 0.7 mile of the new Transmission Main alignment is within the city of Marina where the noise ordinance restricts construction noise to 60 dBA for 25 percent of an hour at the property line of sensitive receptors. Without mitigation, installation of the new Transmission Main would have the same significant impact with regard to generation of noise in excess of regulatory noise standards as the new Desalinated Water Pipeline (i.e., noise levels associated with pipeline installation at nearby residences could be as high as 74.7 and 74.0 dBA L_{eq} for daytime and nighttime construction activities, respectively). Consequently, daytime and nighttime construction activities associated with the northernmost 0.7 miles of the new Transmission Main within the jurisdiction of the city of Marina would be significant. However, implementation of **Mitigation Measures 4.12-1c (Noise Control Plan for Nighttime Pipeline Construction)** would reduce the daytime and nighttime construction noise impact to a less-than-significant level. Additionally, Mitigation Measure 4.12-4 prohibits nighttime construction work within 500 feet of residences in the City of Marina, further reducing the potential nighttime construction noise impact.

At the junction of Highway 1/Lightfighter Drive, the new Transmission Main would be installed beneath Highway 1 via trenchless construction methods. The resultant noise level at 50 feet would be 96 dBA L_{eq} during installation of sheet piles. The City of Marina Municipal Code restricts construction noise to 60 dBA for 25 percent of an hour at any receiving property line. The Roadway Construction Noise Model identifies pile driving as having a usage percentage of 20 percent. Consequently, pile driving noise, while elevated, would be exempt from this restriction of the City’s Municipal Code and therefore consistent with its requirements.

The portion of the new Transmission Main on the west side of Highway 1 is within the jurisdiction of the Fort Ord Reuse Plan as well as the Fort Ord Dunes State Park General Plan. Noise Policy B-9 of the Reuse Plan that requires construction contractors to employ noise-reducing construction practices. Consequently, **Mitigation Measure 4.12-1b (General Noise Controls for Construction Equipment)** is identified to reduce construction noise levels and avoid a significant impact with regard to Noise Policy B-9 of the Reuse Plan.

Policy NOI-3 of the Fort Ord Dunes State Park General Plan requires area-specific projects to develop noise abatement measures to minimize disturbance to park visitors, neighbors, and sensitive wildlife identified as occurring in the area during construction and requires consideration of the following measures:

- Restrict construction activities to daytime hours, where feasible;
- Use best available noise control techniques wherever feasible, including those for vehicles and construction equipment;
- Use hydraulically or electrically powered impact tools when feasible;
- Locate stationary noise sources as far from sensitive receptors as feasible; and
- To the extent feasible, avoid construction during the nesting/breeding seasons of sensitive wildlife known to occur in the project vicinity.

Implementation of **Mitigation Measures 4.12-1a (Neighborhood Notice)**, **4.12-1b (General Noise Controls for Construction Equipment)**, and **4.12-1c (Noise Control Plan for Nighttime Pipeline Construction)** would ensure that the construction noise abatement measures are in place during construction of the new Transmission Main. With implementation of these mitigation measures, pipeline installation activities would be consistent with Policy NOI-3 of the Fort Ord Dunes State Park General Plan.

The southern portion of the new Transmission Main is in the city of Seaside. Implementation Plan N-1.3 of the *City of Seaside General Plan* requires all construction activity to comply with the limits established in the City's noise regulations. While the City of Seaside does not have established noise level limits for construction activities, the Implementation Plan does specify Title 24 of the California Code of Regulations. The sleep interference threshold applied in Impact 4.12-1 with respect to nighttime noise (60 dBA) is predicated on a 25-dBA reduction for standard construction with the windows closed, to maintain an acceptable interior noise environment of 35 dBA at night which would achieve a 45 dBA DNL noise standard for residential dwellings established in Title 24. Impact 4.12-1 identified a potential significant impact with regard to nighttime noise exceeding the sleep interference threshold during construction of the new Transmission Main and identified mitigation to reduce this impact to a less-than-significant level. Therefore, consistency with Implementation Plan N-1.3 (compliance with Title 24 of the CCR) is addressed in Impact 4.12-1 (daytime speech interference and nighttime sleep interference) and mitigation measures are identified to reduce this potential impact to less than significant.

As indicated in Table 4.12-3, all project elements in Seaside would be consistent with Policy C-1.7 of the Seaside General Plan which directs the City to reduce impacts on residential neighborhoods from truck traffic and related noise. Therefore, no impact is expected to result with respect to the generation of noise in excess of regulatory noise standards established by the City of Seaside.

ASR-5 and ASR-6 Wells

The ASR-5 and ASR-6 Wells would be constructed on federal land and would not be subject to the regulatory noise standards of local jurisdictions. As discussed in Section 4.12.3.1, federal regulations establish noise limits for motor vehicles through regulatory controls on truck manufacturers, sets standard for highway and aircraft noise but does not promulgate noise standards for stationary or construction-related sources. Therefore, no impact related to generation of noise in excess of regulatory noise standards would result from installation of the ASR-5 and ASR-6 Wells.

ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline

The proposed ASR Conveyance Pipeline, ASR Recirculation Pipeline and ASR Pump-to-Waste Pipeline would be constructed within the jurisdictions of the city of Seaside and Fort Ord Reuse Plan. The City of Seaside General Plan requires all construction activities to comply with the limits established in the City's noise regulations. While the City of Seaside does not have established noise level limits for construction activities, the Implementation Plan does specify Title 24 of the California Code of Regulations. The sleep interference threshold that is applied in Impact 4.12-1 with respect to nighttime noise (60 dBA) is predicated on a 25-dBA reduction for standard construction with the windows closed, to maintain an acceptable interior noise environment of 35 dBA at night which would achieve a 45 dBA DNL noise standard for residential dwellings established in Title 24. Therefore, consistency with Implementation Plan N-1.3 is addressed in Impact 4.12-1 and mitigation measures are identified to reduce this potential impact to less than significant.

As indicated in Table 4.12-3, all project elements in Seaside would be consistent with Policy C-1.7 of the Seaside General Plan which directs the City to reduce impacts on residential neighborhoods from truck traffic and related noise. Therefore, no impact related to the generation of noise in excess of City of Seaside's regulatory noise standards would result from construction of the proposed ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline.

With respect to consistency with established construction noise level limits of the Fort Ord Reuse Plan, Noise Policy B-9 of the Reuse Plan requires construction contractors to employ noise-reducing construction practices. Specific information regarding noise-reduction measures that would be implemented during project construction is not available. Although CalAm's construction contractors would likely implement Best Management Practices with regard to minimizing construction-related noise, this analysis conservatively assumes no noise-reduction measures would be implemented. As a result, the impact is considered significant. However, implementation of **Mitigation Measure 4.12-1b (General Noise Controls for Construction Equipment)** would ensure that construction contractors to employ noise-reducing construction practices. With implementation of this mitigation, the project would be consistent with the intent of Noise Policy B-9 of the Fort Ord Reuse Plan, and the impact would be reduced to a less-than-significant level.

Carmel Valley Pump Station

For County-permitted projects, Policy S-7.9 of the Monterey County General Plan requires that the project sponsor complete a noise mitigation study if construction noise would exceed the "acceptable" levels listed in Policy S-7.1 within 500 feet of a noise-sensitive land use during evening hours. Because construction of the Carmel Valley Pump Station would not occur during evening hours, construction activities would not conflict with Policy S-7.9.

As indicated in Table 4.12-3, all project elements in Monterey County would be consistent with Monterey County Code Section 10.60.030 which limits the operation of machinery or equipment that produces a noise level exceeding 85 dBA at 50 feet from the source. Therefore, the impact of construction noise from the Carmel Valley Pump Station related to generation of noise in excess of regulatory noise standards would be less than significant.

Interconnections with Highway 68 Satellite Systems

The Main System–Hidden Hills Interconnection Improvements are within 50 feet of a sensitive land use. For County-permitted projects, Policy S-7.9 of the Monterey County General Plan requires the project sponsor to complete a noise mitigation study if construction noise would exceed the "acceptable" levels listed in Policy S-7.1 within 500 feet of a noise-sensitive land use during evening hours. Because the Main System–Hidden Hills Interconnection Improvements would not be constructed during evening hours, they would not conflict with Policy S-7.9.

As indicated in Table 4.12-3, all project elements in Monterey County would be consistent with Monterey County Code Section 10.60.030 which limits the operation of machinery or equipment that produces a noise level exceeding 85 dBA at 50 feet from the source. Therefore, the impact of construction noise from the Interconnections with Highway 68 Satellite Systems related to generation of noise in excess of regulatory noise standards would be less than significant.

Land Use Plans & Policies Consistency

The above impact analysis, in conjunction with **Table 4.12-3** addresses consistency of proposed construction activities with Land Use Plans and Policies as they relate to generation of noise.

Impact Conclusion

There are no established construction noise level standards that would apply to the ASR-5 and ASR-6 Wells. Construction of the subsurface slant wells, Source Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to the CSIP Pond, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, Carmel Valley Pump Station, and MPWSP Desalination Plant would result in less-than-significant impacts with regard to the generation of construction noise levels in excess of local noise level standards.

Construction of the remaining project components (new Desalinated Water Pipeline, Castroville Pipeline, new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline) would generate noise levels in excess of local noise level standards. The new Desalinated Water Pipeline and new Transmission Main would exceed the City of Marina's 60-dBA noise level standard for construction noise, a significant impact. In the absence of project-specific information regarding noise-reduction measures that would be implemented during project construction, it is conservatively assumed that noise resulting from construction of ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline would violate Noise Policy B-9 of the Fort Ord Reuse Plan, a significant impact. Implementation of **Mitigation Measures 4.12-1b** and **4.12-1c** would reduce these impacts to a less-than-significant level.

Mitigation Measures

Mitigation Measure 4.12-1b applies to the new Desalinated Water Pipeline, Castroville Pipeline, new Transmission Main, ASR Conveyance Pipelines, and ASR Pump-to-Waste Pipeline.

Mitigation Measure 4.12-1b: General Noise Controls for Construction Equipment.

(See Impact 4.12-1, above, for description.)

Mitigation Measure 4.12-1c applies only to the new Desalinated Water Pipeline, Castroville Pipeline, and the northern portion of the new Transmission Main.

Mitigation Measure 4.12-1c: Noise Control Plan for Nighttime Pipeline Construction.

(See Impact 4.12-1, above, for description.)

Impact 4.12-3: Expose people to or generate excessive groundborne vibration during construction. (*Less than Significant with Mitigation*)

Construction activities, such as pile driving, that involve impact tools can produce significant groundborne vibration. The substantive sources of vibration during project construction would be: (1) the drill rigs used for drilling and development of the subsurface slant wells in the CEMEX active mining area; (2) the drill rigs used for drilling and development of the ASR-5 and ASR-6 Wells at the Fitch Park military housing area; (3) bulldozers for construction of the MPWSP Desalination Plant; (4) jackhammers used to break up concrete during open-trench construction of pipelines; (5) Pile drivers to install sheet piles for entry and receiving pits where trenchless construction methods of pipeline installation are required; and (6) vibratory rollers, which would be used for construction of many of the project components.

As described above in Sections 4.12.1.2 and 4.12.4.2, substantial groundborne vibration can damage nearby structures or buildings. **Table 4.12-10** presents a summary of and the vibration levels that would result at the nearest structure and sensitive receptor from construction equipment operated for each of the project elements.

TABLE 4.12-10
SUMMARY OF VIBRATION LEVELS AT SENSITIVE RECEPTORS DURING CONSTRUCTION

Project Facility	Vibration-Inducing Construction Equipment	Equipment Vibration Level at 25 feet (PPV in/sec)[a]	Distance from Nearest Structure (feet)	Attenuated Construction Equipment Vibration Level at Nearest Structure (PPV in/sec)[b]	Exceeds Building Damage Thresholds?	Distance from Nearest Sensitive Receptor (feet)	Attenuated Construction Equipment Vibration Level at Nearest Sensitive Receptor (PPV in/sec)[b]	Exceeds Annoyance Thresholds?
Subsurface Slant Wells	Bore/Drill Rigs	0.089	1,100	0.0003	No	4,000	<0.0001	No
MPWSP Desalination Plant	Dozer	0.089	300	0.002	No	2,200	0.0001	No
Pipeline Installation (Open Trench Construction)	Compactor	0.21	25[c]	0.21	No	25[c]	0.21	Yes
Pipeline Installation (Trenchless Construction)	Pile Driver	0.644	40	.318	Yes	40	Yes	Yes
ASR-5 and ASR-6 Wells	Bore/Drill Rigs	0.089	50	0.031	No	50	0.031	No
Main System-Hidden Hills Interconnection Improvements	0.21	Compactor	80	0.037	No	80	0.037	No
Ryan Ranch-Bishop Interconnection Improvements	0.21	Compactor	80	0.037	No	900	0.0009	No
Carmel Valley Pump Station	0.21	Compactor	50	0.074	No	50	0.074	No

NOTES:
[a] Reference vibration levels for construction equipment are derived from FTA, 2006.
[b] Attenuated construction equipment noise levels at the nearest sensitive receptors were calculated using FTA methodology for construction equipment in its 2006 document *Transit Noise and Vibration Impact Assessment*.
[c] Distance between the proposed pipeline alignments and the nearest sensitive receptors varies by pipeline.

Subsurface Slant Wells

Structural Damage. Drill rigs can result in vibration measuring 0.089 in/sec PPV at a distance of 25 feet (FTA, 2006). The nearest structure to the proposed slant well area is the CEMEX building, a historic structure located approximately 1,000 feet east of the subsurface slant well drilling area. As can be seen from Table 4.12-10, vibration levels from slant well drilling and development activities would be attenuated to below the threshold for fragile historic buildings of 0.12 in/sec PPV, resulting in a less-than-significant impact related to damage to this building.

Human Annoyance. As can be seen from Table 4.12-10, vibration levels from slant well drilling and development activities would be attenuated to background levels and would be below the "strongly perceptible" threshold of 0.1 in/sec PPV, resulting in no impact related to human annoyance.

MPWSP Desalination Plant

Structural Damage. The nearest structure to the proposed MPWSP Desalination Plant is the Last Chance Mercantile building located approximately 300 feet to the east, which is not considered a historic structure. As can be seen from Table 4.12-10, vibration levels from slant well drilling and development activities would be attenuated to below the threshold of 0.3 in/sec PPV, resulting in a less-than-significant impact related to damage to this building.

Human Annoyance. The nearest sensitive land use to the proposed MPWSP Desalination Plant is a rural residence on Neponset Road that is located 2,200 feet to the west. Vibration levels from rollers at this distance would be attenuated to background levels, resulting in no impact related to human annoyance.

Source Water Pipeline (Open Trench Construction)

Structural Damage. The Source Water Pipeline would be constructed as close as 65 feet away from historic features of the Lapis Sand Mining Plant Historic District (see Section 4.15, Cultural and Paleontological Resources, for additional information on the Lapis Siding). Thus, the use of vibratory rollers during construction of the Source Water Pipeline could cause cosmetic or structural damage to historic resources. The estimated vibration level that would be generated by a vibratory roller (expected construction equipment with the greatest PPV) is 0.12 in/sec PPV at a distance of 45 feet. Because the construction would occur farther than 45 feet away from the historic structures, damage to historic resources is not anticipated to result in a substantial adverse change in the significance of historical resources, and the impact would be less than significant.

Human Annoyance. The nearest sensitive receptors to the proposed Source Water Pipeline are residences on Neponset Road located approximately 1,100 feet away. At this distance vibration levels from rollers would be attenuated to background levels, resulting in no impact related to human annoyance.

Source Water Pipeline (Trenchless Construction)

Structural Damage. Approximately 500 feet east of Highway 1 and roughly 1,000 feet northeast of Del Monte Boulevard and Charles Benson Road, at Lapis Road, the Source Water Pipeline would be installed beneath railroad tracks using trenchless construction methods. This location is over 2,000 feet from historic features of the Lapis Sand Mining Plant Historic District or any other structure. Construction equipment for sheet pile installation would generate vibration levels above the 0.12 in/sec PPV vibration threshold for damage to historic buildings if it were to occur within 77 feet of such a structure. Because the construction would be over 2,000 feet from the historic district, there would be no impact with regard to structural damage from jack and bore construction activities.

Human Annoyance. The proposed jack-and-bore location for the Source Water Pipeline is over 3,500 feet from residential or other sensitive land uses. At this distance vibration levels would be attenuated to background levels, resulting in no impact related to human annoyance.

New Desalinated Water Pipeline and New Transmission Main (Open Trench Construction)

Structural Damage. The nearest structure to the new Desalinated Water Pipeline and new Transmission Main would be located approximately 100 feet away but none of these structures are historic. Vibration levels from vibratory rollers would reach 0.21 in/sec PPV at a distance of 25 feet. At 100 feet, vibration levels from roller operations would be attenuated to less than 0.03 in/sec PPV, which is below the threshold for non-fragile buildings of 0.3 in/sec PPV, resulting in a less-than-significant impact.

Human Annoyance. The nearest sensitive land use to the new Desalinated Water Pipeline and new Transmission Main would be located approximately 100 feet away. Vibration levels from rollers at this distance would be attenuated to less than 0.03 in/sec PPV, resulting in a less-than-significant impact related to human annoyance.

New Desalinated Water Pipeline and New Transmission Main (Trenchless Construction)

Structural Damage. Construction equipment for sheet pile installation would generate vibration levels above the 0.3 in/sec PPV structural damage threshold at modern buildings if it were to occur within 45 feet of such a structure. Such a condition would only potentially occur at location (F) in **Figure 4.12-1**, the southern terminus of Marina Drive in the City of Marina where the entry pit would be approximately 45 feet from an existing residential structure resulting in a vibration level would be 0.27 in/sec PPV. Implementation of **Mitigation Measure 4.12-3 (Vibration Reduction Measures)**, which would require vibration monitoring and restrict location of sheet piles, if necessary, would reduce this impact to a less-than-significant level.

Human Annoyance. Sheet pile driving could occur within 45 feet from residential and other sensitive land uses along the Desalinated Water Pipeline and new Transmission Main where the vibration level is predicted to be 0.27 in/sec PPV. Vibration levels from pile drivers would meet the “strongly perceptible” threshold of 0.1 in/sec PPV, at a distance of 85 feet from sensitive land uses, resulting in a significant impact related to human annoyance, particularly if these operations were to occur during nighttime hours. Implementation of **Mitigation Measure 4.12-3 (Vibration Reduction Measures)**, which would restrict pile driving to daytime hours, require vibration monitoring and restrict locations of access pits where piles would be inserted, if necessary, would reduce this impact to a less-than-significant level.

Castroville Pipeline (Open Trench Construction)

Structural Damage. The nearest structure to the proposed Castroville Pipeline would be located are rural residential structures at the north bank of the Salinas River, approximately 200 feet away which is not a historic structure. Vibration levels from vibratory rollers for construction of these pipelines would reach 0.21 in/sec PPV at a distance of 25 feet, which is below the threshold of 0.03 in/sec PPV. At 200 feet, vibration levels from roller operations would be attenuated to less than 0.009 in/sec PPV, which is also below the threshold for non-fragile buildings of 0.3 in/sec PPV, resulting in a less-than-significant impact related to damage to buildings.

Human Annoyance. The nearest sensitive land use to the Castroville Pipeline would be located approximately 200 feet away. Vibration levels from rollers at this distance would be attenuated to than 0.009 in/sec PPV. This level would not exceed the “strongly perceptible” threshold of 0.1 in/sec PPV, resulting in a less than significant impact related to human annoyance.

Castroville Pipeline and Castroville Pipeline Optional Alignment 1 (Trenchless Construction)

Structural Damage. The nearest structures to the entry and receiving pits for the Castroville Pipeline at the Salinas River and Tembladero Slough crossings, and for the Castroville Pipeline Optional Alignment 1 at the Tembladero Slough crossing, would be 420 feet. At this distance, the vibration impact would be attenuated to background levels, resulting in no impact related to damage to buildings.

Human Annoyance. Vibration levels from pile driving would be below the “strongly perceptible” threshold of 0.1 in/sec PPV beyond 85 feet. The nearest sensitive receptor to either of the two jack and bore pits for the Castroville Pipeline (and its Optional alignment) would be 420 feet, resulting in no impact related to human annoyance.

Brine Discharge Pipeline and Pipeline to the CSIP Pond (Open Trench Construction)

The nearest structures to the Pipeline to the CSIP Pond, Brine Discharge Pipeline, and the Brine Mixing Box are located approximately 3,600 feet away from the pipeline alignments and are not historic structures. Vibration levels from vibratory rollers for construction of the pipelines would be attenuated to background levels, resulting in no impact related to damage to buildings or human annoyance.

ASR-5 and ASR-6 Wells

Structural Damage. There are no fragile buildings located within 25 feet of the proposed ASR injection/extraction wells. The nearest structure to the proposed ASR injection/extraction well sites is a residence located approximately 50 feet away that is not considered a historic structure. At this distance, vibration levels from well drilling would be 0.03 in/sec. This level is below the 0.3 in/sec PPV threshold, resulting in a less-than-significant vibration impact related to damage to this building.

Human Annoyance. The nearest sensitive land use to the proposed ASR injection/extraction well sites is a residence located approximately 50 feet away. At this distance, drilling vibration would be attenuated to 0.03 in/sec. This level is below the “strongly perceptible” threshold of 0.1 in/sec PPV, resulting in a less-than-significant impact related to human annoyance.

ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline (Open Trench Construction)

Structural Damage. The nearest structures to the three ASR pipelines would be located approximately 100 feet away and are not historic structures. Vibration levels from vibratory rollers for construction of these pipelines would reach 0.21 in/sec PPV at a distance of 25 feet. At 100 feet, vibration levels from roller operations would be attenuated to less than 0.03 in/sec PPV, which is below the threshold for non-fragile buildings of 0.3 in/sec PPV, resulting in a less-than-significant impact related to damage to buildings.

Human Annoyance. The nearest sensitive land use to the three proposed ASR pipelines would be located approximately 100 feet away. Vibration levels from rollers at this distance would be attenuated to less than 0.03 in/sec PPV, which is below the “strongly perceptible” threshold of 0.1 in/sec PPV, resulting in a less-than-significant impact related to human annoyance.

Highway 68 Interconnection Improvements and Carmel Valley Pump Station

Structural Damage. The nearest structures to the proposed Highway 68 Interconnection Improvements would be approximately 80 feet away and are not historic structures. The nearest structures to the proposed Carmel Valley Pump Station would be approximately 50 feet away and are not historic structures. Vibration levels from vibratory rollers for construction of these facilities would reach 0.21 in/sec PPV at a distance of 25 feet. At 80 feet, vibration levels from roller operations would be attenuated to 0.037 in/sec PPV, which is below the threshold for non-fragile buildings of 0.3 in/sec PPV, resulting in a less-than-significant impact related to damage to buildings near the proposed Highway 68 Interconnection Improvements. At 50 feet, vibration levels from roller operations would be attenuated to 0.07 in/sec PPV, which is below the threshold, resulting in a less-than-significant impact.

Human Annoyance. The nearest sensitive land uses to the proposed Highway 68 Interconnection Improvements would be approximately 80 feet away. Vibration levels from rollers at this distance would be attenuated to than 0.037 in/sec PPV. This level is below the “strongly perceptible” threshold of 0.1 in/sec PPV, resulting in a less-than-significant impact related to human annoyance.

The nearest sensitive land uses to the proposed Carmel Valley Pump Station would be approximately 50 feet away. Vibration levels from rollers at this distance would be attenuated to than 0.07 in/sec PPV. This level is below the “strongly perceptible” threshold of 0.1 in/sec PPV, resulting in a less-than-significant impact related to human annoyance.

All Other Proposed Facilities

No impact would result from the Pipeline to the CSIP Pond, Brine Discharge Pipeline, and Brine Mixing Box because equipment used for common construction techniques for these facilities would not involve vibration inducing equipment or activities such as drill rigs, bulldozers, or pile drivers to install sheet piles.

Land Use Plans & Policies Consistency

In addition to the physical impacts described above, as noted in **Table 4.12-3**, MPWSP construction could conflict with applicable land use plans, policies, or ordinances related to vibration. Specifically, Monterey County General Plan Policy S-7.8 requires a pre-construction vibration study for all discretionary projects that propose to use heavy construction equipment with the potential to create vibrations that could cause structural damage to adjacent structures within 100 feet. Pile driving or blasting are identified as illustrative of the type of equipment that could be subject to this policy. The proposed Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to the CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills Interconnection Improvements, and Ryan Ranch-Bishop Interconnection Improvements are located in unincorporated Monterey County. Of these project components, none would involve blasting and only the Desalinated Water Pipeline and the Source Water Pipeline would involve (sheet) pile driving. However, there are no structures within unincorporated Monterey County that are within 100 feet of the Desalinated Water Pipeline or the Source Water Pipeline. Therefore, these construction activities would be consistent with Policy S-7.8.

Impact Conclusion

Construction of the subsurface slant wells, MPWSP Desalination Plant, and Source Water Pipeline would result in less-than-significant vibration impacts with regard to structural damage, and no impact with regard to human annoyance. Construction of the Castroville Pipeline, ASR-5 and ASR-6 Wells, ASR Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Carmel Valley Pump Station, and Main System-Hidden Hills Interconnection Improvements would result in less-than-significant vibration impacts with regard to both structural damage and human annoyance. There could be significant vibration impacts related to structural damage and human annoyance from construction of the new Desalinated Water Pipeline and new Transmission Main where trenchless construction methods are required for these pipelines. However, with implementation of the mitigation measures identified above, all significant construction vibration impacts would be reduced to a less-than-significant level.

Mitigation Measures

Mitigation Measure 4.12-3 applies to the new Desalinated Water Pipeline and new Transmission Main if trenchless construction is required.

Mitigation Measure 4.12-3: Vibration Reduction Measures.

Construction practices shall be utilized that do not generate vibration levels at the closest sensitive land uses above 0.1 in/sec PPV. The following measures, at a minimum, shall be employed to ensure this threshold is met:

a. Vibration monitoring shall be conducted for the first 500 feet of pipeline construction for each segment to confirm vibration levels do not exceed the above vibration threshold. If vibration levels exceed the limits of this mitigation measure, construction practices shall be modified to use smaller types of construction equipment or excavator-mounted compaction wheels, operate the equipment in a manner to reduce vibration, or use alternate construction methods, (such as use of manual shoring jacks), and monitoring shall continue for an additional 200 feet or until construction practices meet the required vibration levels. The monitoring in this mitigation measure shall be repeated if the construction methods change in a manner that would increase vibration levels, or when structures are closer to the limits of construction than previous vibration monitoring have confirmed is below the vibration thresholds.

b. Smaller vibratory rollers shall be used to minimize vibration levels during repaving activities where needed to meet vibration limits.

c. Sheet pile driving for trenchless pipeline installation shall be conducted during daytime hours and access pits shall be located greater than 45 feet from standard structures and 80 feet from historic resources.

Impact 4.12-4: Consistency with the construction time limits established by the local jurisdictions. (*Less than Significant with Mitigation*)

State, regional, and local plans, policies, and ordinances related to noise and vibration are presented in **Table 4.12-3**. The table presents the analysis of project consistency with each of these plans, policies, and ordinances. Consistency of all project components with respect to generation of noise levels in excess of quantitative noise standards of General Plans or noise ordinances are addressed in Impact 4.12-2, above, and 4.12-6, below. This impact addresses project consistency with construction time limits.

The following local noise ordinances establish specific construction time limits:

- Seaside Municipal Code Section 9.12.030 (D) sets time limits for construction activities, including demolition, excavation, erection, alteration, or repair. These activities may not occur before 7:00 a.m. or after 7:00 p.m. (except on Saturday, Sunday, and holidays, when the allowable construction hours are 9:00 a.m. to 7:00 p.m.) unless authorized in writing by a building official (City of Seaside, 2008).
- The Marina Municipal Code, Chapter 15.04, Section 15.04.055, Construction Hours and Noise applies to any construction activities that require a building, grading, demolition, use,

or other city permit. This section limits outdoor construction, repair work, or related activities that produce noise adjacent to residential uses, including transient lodging, to the hours of 7:00 a.m. to 7:00 p.m. (standard time) Monday through Saturday, and 10:00 a.m. to 7:00 p.m. (standard time) on Sundays and holidays. During daylight savings time, construction hours may be extended to 8:00 p.m.

- The City of Monterey Municipal Code, Section 38-112.2, places the following time restrictions on construction activities: Monday through Friday, 7:00 a.m. to 7:00 p.m.; Saturday, 8:00 a.m. to 6:00 p.m.; and Sunday, 10:00 a.m. to 5:00 p.m. However, the City will authorize construction outside of these time limits under certain circumstances.

Project components within these communities include:

- subsurface slant wells in the city of Marina
- portions of the Source Water Pipeline in the city of Marina
- portions of the new Desalinated Water Pipeline in the city of Marina
- portions of the new Transmission Main in the city of Marina
- portions of the new Transmission Main in the city of Seaside

In addition to those project components listed above, there are other project components (i.e. MPWSP Desalination Plant, Castroville Pipeline) that would require nighttime construction but that are not located within a jurisdiction with established construction time limits. For this reason, these other components would not conflict with construction time limits and are not discussed further.

Subsurface Slant Wells and Source Water Pipeline

Due to the substantial distance from sensitive receptors (4,000 feet and 1,100 feet), installation of the subsurface slant wells and Source Water Pipeline, respectively, would not be subject to the city of Marina's construction time limits, which only apply to outdoor construction activities adjacent to residential land uses. No inconsistency with the City's Noise Ordinance time restriction would result.

New Desalinated Water Pipeline and New Transmission Main

A majority of the pipeline installation of the new Desalinated Water Pipeline would occur within the City of Marina and as close as 100 feet from residential uses. The City of Marina's noise ordinance time limits prohibits nighttime construction work if it would be "adjacent to residential uses". The ordinance does not specify a distance that defines the term adjacent. As a conservative estimate for application of the noise ordinance relative to open trench pipeline construction, the baseline noise level of 80.4 dBA, L_{eq} at 50 feet for open trench construction from Table 4.12-6 was attenuated to the 60 dBA, L_{eq} sleep interference threshold which would occur at a distance of 500 feet. Therefore open trench pipeline construction work that would occur within 500 feet of a residence or lodging facility would exceed 60 dBA and result in a significant impact and is considered to be inconsistent with the noise ordinance. Mitigation Measure 4.12-4 (Nighttime Construction Restrictions in Marina) is identified to ensure that open trench pipeline construction is conducted in accordance with the City of Marina's construction noise ordinance.

New Transmission Main (and Optional Alignments)

Pipeline installation of the northernmost portion of the new Transmission Main would be conducted within the City of Marina and as close as 100 feet from residential uses. Similar to the new Desalinated Water Pipeline, nighttime open trench pipeline construction would be inconsistent with the noise ordinance when within 500 feet of a residence or lodging facility. **Mitigation Measure 4.12-4 (Nighttime Construction Restrictions in Marina)** is identified to ensure that open trench pipeline construction is conducted in accordance with the City of Marina’s construction noise ordinance.

The southern portion of the new Transmission Main along Light Fighter Drive and General Jim Moore Boulevard would be constructed within the City of Seaside. This work could occur beyond the time restrictions of the City’s Municipal Code and require approval by the City of Seaside. All nighttime construction work would be conducted only with prior approval from the relevant jurisdictions. **Mitigation Measure 4.12-1c (Noise Control Plan for Nighttime Pipeline Construction)** would reduce the nighttime construction noise impact but would not change the inconsistency with the restriction of the noise ordinance. Because the City of Seaside Municipal Code could allow construction activity outside listed hours under certain circumstances, the construction activities would not violate local regulations and the impact would be less than significant.

All Other Project Facilities

As indicated in Table 4.12-2, no impact associated with conflicts with local construction time limits would occur from implementation of all other project components because these components would not require nighttime construction and/or are not located within a jurisdiction with established construction time limits.

Mitigation Measures

Mitigation Measure 4.12-1c applies only to the ASR-5 and ASR-6 Wells.

Mitigation Measure 4.12-1c: Noise Control Plan for Nighttime Pipeline Construction.

(See Impact 4.12-1, above, for description.)

Mitigation Measure 4.12-4 applies only to the new Desalinated Water Pipeline and the New Transmission Main.

Mitigation Measure 4.12-4: Nighttime Construction Restrictions in Marina

Open trench pipeline construction work within 500 feet to residential uses or transient lodging shall be restricted to the hours of 7:00 a.m. to 7:00 p.m. (standard time) Monday through Saturday, and 10:00 a.m. to 7:00 p.m. (standard time) on Sundays and holidays. During daylight savings time, construction hours may be extended to 8:00 p.m.

4.12.6.2 Operational and Facility Siting Impacts

None of the proposed facilities would expose people to, or generate, groundborne vibration during routine maintenance and project operations. Thus, the groundborne vibration is not relevant to project operations and is not discussed in the impact analysis below (see the second evaluation criterion in Section 4.12.4, above).

Impact 4.12-5: Substantial permanent increases in ambient noise levels in the project vicinity above levels existing without the project during operations. (*Less than Significant with Mitigation*)

As described in Section 4.12.5, above, this evaluation uses a 5-dBA increase in noise exposure—which is considered a readily perceptible increase in noise levels (Caltrans, 2009)—to assess the significance of operational noise increases in ambient noise levels in the project vicinity.

Mobile Noise Sources

MPWSP Desalination Plant

For the purposes of this noise analysis, vehicle trips are mobile sources of noise. The MPWSP Desalination Plant would be operated 24 hours per day, 365 days per year. The MPWSP Desalination Plant is estimated to require approximately 25 to 30 full-time workers (facility operators and support personnel) to operate, monitor, and maintain the desalination facilities. Approximately 66 one-way trips (33 round trips) would occur throughout each day (30 commute trips and three deliveries) during long-term operations and maintenance of the MPWSP Desalination Plant. Given the minimal increase in daily vehicle trips associated with worker commutes and deliveries, vehicle trips associated with long-term operations and maintenance of the MPWSP Desalination Plant would not substantially increase noise levels along project area roadways. This impact is less than significant.

All Other Proposed Facilities

Operation of the proposed pipelines would not require routine site visits. All other proposed facilities (i.e., the subsurface slant wells, Brine Mixing Box, improvements to the ASR system, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station) would be operated remotely using Supervisory Control and Data Acquisition systems, with periodic visits by CalAm personnel for operations review and maintenance. Maintenance activities include such tasks as landscape maintenance, visual inspections of facilities, performance monitoring, servicing of pumps, testing and servicing of valves, backflushing the ASR-5 and ASR-6 Wells, and pipeline repairs. The vehicle trips generated by these routine and periodic site visits would be similar in number to those required for existing CalAm operations in the Monterey District service area system (see Impact 4.9-8 in Section 4.9, Traffic and Transportation) and would not increase noise levels on area roadways. This impact is less than significant.

For all project components, impacts associated with traffic-related noise during project operations would be less than significant.

Stationary Noise Sources

Subsurface Slant Wells

All 10 slant wells would be designed as pumping wells, and a 2,500 gallons per minute (gpm) submersible pump would be lowered into each wellhead. Each wellhead would be enclosed in an aboveground 12-foot-long, 6-foot-wide, and 8-inch-tall precast concrete vault. Up to eight wells would operate at any given time and two wells would be maintained on standby.

Noise from pump operations would be attenuated by both soil and the subsurface concrete casing. A pump motor would typically generate a noise level on the order of 76 dBA, L_{eq} at a distance of 50 feet (FTA, 2006) without an enclosure. However, the presence of the concrete enclosure and the subsurface locations would be expected to provide a minimum of 20 dBA attenuation. Simultaneous operation of 10 well pumps would conservatively generate a noise level of approximately 66 dBA at 50 feet.

The two closest sensitive receptors to the subsurface slant wells are residences at the Marina Dunes RV Park on Dunes Drive in Marina (4,000 feet to the south) and residences on Drew Street in Marina (4,300 feet to the southeast). At these distances, slant well pump noise would be reduced to 21 dBA which is substantially below nighttime ambient levels monitored at these locations (51 dBA, L_{eq}) and would not contribute meaningfully to ambient levels. Therefore, the impact related to increases in ambient noise levels during operation of the subsurface slant wells would be less than significant.

MPWSP Desalination Plant

The RO system at the MPWSP Desalination Plant would include a series of pumps but these would be located inside the treatment building and are not expected to generate substantial noise. The 750-kilowatt (kW) (1,000 hp) emergency diesel-powered generator proposed adjacent to and outside of the administration building at the MPWSP Desalination Plant site would be used for emergency back-up power only but would be operated weekly for 20 to 30 minutes during the daytime to test and maintain the engine. Generators of this size typically generate a noise level of 81 dBA L_{max} at 50 feet (FHWA, 2006). The attenuated generator noise level at the nearest residences on Neponset Road located 2,200 feet away would be approximately 47.8 dBA L_{max}. When the attenuated generator noise level is added to the existing ambient noise level at these same receptors of 61.8 dBA, L_{eq}, the resultant exterior noise level at these receptors would be 62.0 dBA, which would be an increase of 0.2 dBA over ambient noise levels. This would be a less than the 5-dBA threshold. Therefore, the impact would be less than significant.

ASR-5 and ASR-6 Wells

The ASR-5 and ASR-6 Wells would be 50 feet west of residences on Ardennes Circle. Each well would be equipped with a permanent 500-hp multistage vertical turbine pump. Each well pump and electrical control system would be housed in a 900-square-foot concrete pump house.

Well pump motors would generate noise levels of up to 76 dBA L_{max} at 50 feet; however, placing the motors in a standard concrete pump house would attenuate noise levels by at least 20 dBA (to 56 dBA L_{max} at 50 feet), as shown in **Table 4.12-11**.

As shown in **Table 4.12-11**, the increase in ambient noise levels at the residences on Ardennes Circle would be 5.5 dBA L_{eq}, which is above the 5-dBA threshold and thus would be a significant permanent noise increase over existing conditions. However, implementation of **Mitigation Measure 4.12-5 (Stationary Source Noise Controls)** would reduce this impact to less than significant by ensuring that sufficient noise insulation or sound-absorbing material is provided to the pump enclosure to provide additional noise attenuation.

TABLE 4.12-11
MAXIMUM OPERATIONAL NOISE LEVELS – ASR-5 AND ASR-6 WELLS

Stationary Source	Distance to Receptors (feet)	Existing Ambient Noise Level at Receptors (dBA Leq)[a]	Attenuated Operational Noise Level at Receptor (dBA Lmax)	Resultant Noise Level at Receptor (dBA Leq)	Increase over Existing Ambient Noise Level (dBA Leq)	Resultant Noise Level at Receptor (dBA CNEL)[b]
ASR-5 and ASR-6 Wells – Pump Motors	50	52.0 (S4)	56	57.5	5.5	63

NOTES:
[a] Based on daytime ambient noise level at short-term noise monitoring location S4 (see **Figure 4.12-1** and **Table 4.12-1**).
[b] CNEL Values are used in assessment of Impact 4.12-6.

Carmel Valley Pump Station

The Carmel Valley Pump Station would be located approximately 240 feet south of Carmel Valley Road near the intersection of Rancho San Carlos Road. The closest residences are located approximately 50 feet to the north and east of the pump station site. The pump station would be enclosed in a 500-square-foot, single-story building. It was assumed, based on ESA's monitoring of municipal water pumps, that the pump at Carmel Valley Pump Station would generate noise levels of up to 76 dBA L_{max} at 50 feet and that the building enclosure would attenuate noise levels by approximately 20 dBA (to 56 dBA L_{eq} at 50 feet). As shown in **Table 4.12-12**, the increase in ambient noise levels at the closest residences to the Carmel Valley Pump Station would be 1.1 dBA L_{eq}, which is below the 5-dBA threshold and thus, the impact would be less than significant. Additionally, a portable 50 kW (68 hp) diesel powered generator would be stored onsite at the Carmel Valley Pump Station site for use in the event of a power outage. This is a relatively modest sized unit and its occasional operation during daytime hours for testing purposes would generate less noise than that of a diesel automobile and would not be expected to result in substantial increase over daytime noise levels. The impact would be less than significant.

TABLE 4.12-12
MAXIMUM OPERATIONAL NOISE LEVELS –CARMEL VALLEY PUMP STATION

Stationary Source	Distance to Closest Receptor (feet)	Existing Ambient Noise Level at Receptor (dBA Leq)[a]	Attenuated Operational Noise Level at Receptor (dBA Leq)	Resultant Noise Level at Receptor (dBA Leq)	Increase Over Existing Ambient Noise Level (dBA)
Carmel Valley Pump Station Motor	50	61.5 (S7)	56	62.6	1.1

NOTE:
[a] Based on daytime ambient noise level at short-term noise monitoring locationS7 (see **Figure 4.12-1** and **Table 4.12-1**).

Main System-Hidden Hills Interconnection Improvements

The existing interconnection between the main CalAm distribution system and the Hidden Hills satellite water system would be improved by installing approximately 1,200 feet of 6-inch-diameter pipeline along Tierra Grande Drive, with a connection to the existing Upper Tierra Grande Booster Station. The Upper Tierra Grande Booster Station has an existing capacity of 129 gpm. A new 350 gpm pump would be added to the booster station. In addition, the existing pump capacity of the Middle Tierra Grande Booster Station, located on lower Casiano Drive, would be upgraded from 161 gpm to 400 gpm by adding a new 350 gpm pump (CalAm, 2013).

These new pumps would be located in the existing buildings at each booster station. It was assumed, based on ESA's monitoring of municipal water pumps, that the pump at each booster station would generate noise levels of up to 76 dBA L_{max} at 50 feet and that the building enclosure would attenuate noise levels by at least 15 dBA, to 61 dBA L_{max} at 50 feet and 55 dBA, L_{eq} at 100 feet. As shown in **Table 4.12-13**, the increase in ambient noise levels in the project vicinity above existing levels would exceed the 5-dBA threshold and thus represents a significant permanent noise increase over existing conditions. However, implementation of **Mitigation Measure 4.12-5 (Stationary Source Noise Controls)** would reduce this impact to a less-than-significant level by ensuring that sufficient noise insulation or sound absorbing material is provided to the existing enclosure to provide additional noise attenuation.

TABLE 4.12-13
MAXIMUM OPERATIONAL NOISE LEVELS –
BOOSTER STATIONS (MAIN SYSTEM–HIDDEN HILLS INTERCONNECTION IMPROVEMENTS)

Stationary Source	Distance to Closest Receptor (feet)	Existing Ambient Noise Level at Receptor (dBA Leq)	Attenuated Operational Noise Level at Receptor (dBA Leq)	Resultant Noise Level at Receptor (dBA Leq)	Increase Over Existing Ambient Noise Level (dBA)
Pump Motor – Upper Tierra Grande	50	44.7	61	61.1	16.3
Pump Motor – Middle Tierra Grande	100	44.7	55	55.4	10.3

NOTE:
[a] Based on daytime ambient noise level at short-term noise monitoring location S6 (see **Figure 4.12-1** and **Table 4.12-1**).

All Proposed Pipelines

The proposed pipelines would not involve the installation of stationary noise sources such as pumps and emergency generators. Therefore, operation of these facilities would result in no impact related to permanent increases in ambient noise levels.

Impact Conclusion

Operation of the subsurface slant wells, MPWSP Desalination Plant, Ryan Ranch-Bishop Interconnection Improvements, and Carmel Valley Pump Station would result in less-than-significant noise impacts with regard to permanent operational noise increases. Significant noise impacts would result from operation of the ASR-5 and ASR-6 Wells and the booster stations that would be upgraded by the Main System-Hidden Hills Interconnection Improvements; however, implementation of **Mitigation Measure 4.12-5** would reduce all significant operational noise impacts to a less-than-significant level. No impact would result from operation of the proposed pipelines.

Mitigation Measure

Mitigation Measure 4.12-5 applies to the ASR-5 and ASR-6 Wells and the Main System-Hidden Hills Interconnection Improvements.

> **Mitigation Measure 4.12-5: Stationary-Source Noise Controls.**
>
> CalAm shall retain an acoustical engineer to design stationary-source noise controls and ensure the applicable noise standards are met. At a minimum, all stationary noise sources (e.g., pump station, emergency generators, variable-frequency-drive motors, well heads with motors) shall be located within enclosed structures and with adequate noise screening, as needed, to maintain noise levels to no greater than 5 dBA above the existing monitored ambient values and 60 CNEL, at the property lines of nearby residences and other noise-sensitive receptors. Once the stationary noise sources have been installed, the contractor(s) shall conduct a single long-term (24-hour) monitoring of noise levels to ensure compliance with local noise standards. CalAm shall submit a compliance monitoring report to the CPUC.

Impact 4.12-6: Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during operations. (*Less than Significant*)

Subsurface Slant Wells

As described in Impact 4.12-5, noise from slant well pump operations would be attenuated by both soil and the subsurface concrete casing. Simultaneous operation of 10 well pumps would conservatively generate a noise level of approximately 66 dBA at 50 feet.

Table 4.12-3 shows that slant well pump noise would be reduced to 21 dBA at the closest sensitive receptor (Marina Dunes RV Park on Dunes Drive in Marina, 4,000 feet to the south) which is below the *City of Marina General Plan* establishes a daytime noise level of 50 dBA L_{eq}

and a nighttime noise level of 45 dBA, L_{eq} as the maximum allowable noise at the property line of the nearest receptor. Therefore, operational noise from the subsurface slant well pumps would have a less than significant impact with regard to generation of noise levels in excess of standards established in the local plan or noise ordinance.

MPWSP Desalination Plant

CalAm would install a 750-kW (1,000 hp) emergency diesel-powered generator adjacent to the administration building at the MPWSP Desalination Plant site. As discussed in Impact 4.21-5, the generator would be operated weekly for 20 to 30 minutes during the daytime to test and maintain the engine which would result in a predicted noise level from generator operation of approximately 47.8 dBA L_{max} at the nearest residences (2,200 feet away). The RO system would also require a series of specialty pumps but these would be located within the treatment building and are not expected to generate substantial noise.

Policy S-7.6 of the County Plan Noise Element requires an acoustical analysis for proposed noise generators are likely to produce noise levels exceeding the levels shown in the adopted Community Noise Ordinance when received at existing or planned noise-sensitive receptors. The Monterey County Code, Chapter 10.60, Noise Control, Section 10.60.030 limits the operation of any machine, mechanism, device, or contrivance that produces a noise level exceeding 85 dBA at 50 feet from the source. The proposed generator would be in compliance with the restriction of the County noise ordinance. Therefore, operational noise the MPWSP Desalination Plant would have a less than significant impact with regard to generation of noise levels in excess of standards established in the local plan or noise ordinance.

ASR-5 and ASR-6 Wells

The ASR injection/extraction wells (ASR-5 and ASR-6 Wells) are proposed on federal land and would not be subject to the noise standards of local jurisdictions. As discussed in Section 4.12.3.1, federal regulations establish noise limits for motor vehicles through regulatory controls on truck manufacturers, sets standard for highway and aircraft noise but does not promulgate noise standards for stationary or construction-related sources. Therefore, no impact related to generation of noise in excess of local regulatory noise standards would result from operation of the new ASR injection/extraction wells.

Carmel Valley Pump Station

The closest residences are located approximately 50 feet to the north and east of the Carmel Valley pump station site.

Policy S-7.4 of the Monterey County General Plan Noise Element requires an acoustical analysis for proposed noise generators that are likely to produce noise levels exceeding the levels shown in the adopted Community Noise Ordinance when received at existing or planned noise-sensitive receptors. The Monterey County Code, Chapter 10.60, Noise Control, Section 10.60.030 limits the operation of any machine, mechanism, device, or contrivance that produces a noise level exceeding 85 dBA at 50 feet from the source.

As discussed in Impact 4.12-5, the proposed building enclosure would attenuate noise levels from pump operations to 56 dBA L_{eq} at 50 feet. The proposed pumps would be in compliance with the County noise ordinance.

Additionally, a portable 50 kW (68 hp) diesel powered generator would be stored onsite at the Carmel Valley Pump Station site for use in the event of a power outage. Available data indicate that generators of this size operate at 83 dBA at a distance of 7 meters under full load (Cummins, 2008) which equates to 76 dBA at 50 feet. The proposed pump station and generator would be in compliance with the County noise ordinance and operational noise associated with the Carmel Valley Pump Station would have a less than significant impact with regard to generation of noise levels in excess of standards established in the local plan or noise ordinance.

Main System-Hidden Hills Interconnection Improvements

The existing interconnection between the main CalAm distribution system and the Hidden Hills system would be improved by installing a new 350 gpm pump to the Upper Tierra Grande booster station. In addition, the existing pump capacity of the Middle Tierra Grande Booster Station, located on lower Casiano Drive, would be upgraded by adding a new 350 gpm pump (CalAm, 2013).

As discussed in Impact 4.12-5, that the pump at each booster station would generate noise levels of up to 76 dBA L_{max} at 50 feet and that the building enclosure would attenuate noise levels by at least 15 dBA, to 61 dBA L_{max} at 50 feet and 55 dBA, L_{eq} at 100 feet.

Policy S-7.6 of the Monterey County General Plan Noise Element requires an acoustical analysis for proposed noise generators that are likely to produce noise levels exceeding the levels shown in the adopted Community Noise Ordinance when received at existing or planned noise-sensitive receptors. The Monterey County Code, Chapter 10.60, Noise Control, Section 10.60.030 (Monterey County, 2008) limits the operation of any machine, mechanism, device, or contrivance that produces a noise level exceeding 85 dBA at 50 feet from the source. The proposed pumps that would be installed at the Upper Tierra Grande Booster Station and Middle Tierra Grande Booster Station as part of the Main System-Hidden Hills Interconnection Improvements would be in compliance with the restriction of the County noise ordinance and operational noise the improvements to the Hidden Hills Booster Stations would have a less than significant impact with regard to generation of noise levels in excess of standards established in the local plan or noise ordinance.

All Other Proposed Facilities

Stationary noise sources such as pumps and emergency generators are not proposed at any of the proposed pipelines. The Brine Mixing Box would be operated 5,800 feet from the nearest receptor and is not expected to generate noise levels in excess of standards established in the local plan or noise ordinance. Therefore, there would be little to no increase in ambient noise levels from stationary noise sources at all other facilities and the impact is less than significant.

Impact Conclusion

Operation of the Subsurface Slant Wells, MPWSP Desalination Plant, Source Water Pipeline, Pipeline to the CSIP Pond, Brine Discharge Pipeline, Brine Mixing Box, Desalinated Water Pipeline, Transmission Main, Ryan Ranch-Bishop Interconnection Improvements, Carmel Valley Pump Station, the booster stations that would be upgraded by the Main System-Hidden Hills Interconnection Improvements would result in less than significant noise impacts with regard to generation of noise levels in excess of local noise level standards. No impact would result from operation of the ASR-5 and ASR-6 Wells with regard to generation of noise in excess of local noise level standards because none would apply to these sources on federal lands. No impact would result from operation of the proposed pipelines because the pipelines would not involve the installation of stationary noise sources.

Mitigation Measure

None proposed.

4.12.7 Cumulative Effects of the Proposed Project

As described in Section 4.12.4, the project would have no impact with respect to exposing people to excessive noise levels in proximity to an airport or private airstrip. Furthermore, none of the MPWSP components would generate operational vibration. Therefore, the MPWSP could not contribute to cumulative impacts related to these topics.

Impact 4.12-C: Cumulative impacts related to noise and vibration. (*Significant and Unavoidable*)

Construction Noise Impacts

The geographic scope of analysis for cumulative noise impacts is defined by the presence of sensitive receptors within 500 feet of those MPWSP components whose daytime construction noise could exceed speech interference thresholds or whose nighttime construction noise could exceed sleep interference thresholds. Such MPWSP components include the proposed subsurface slant wells, the proposed pipelines, ASR-5 and ASR-6 Wells, pump station, and other project facilities. Beyond 500 feet, the MPWSP's contributions to cumulative noise impacts would be greatly attenuated and not be expected to combine with that of other cumulative projects to result in a significant cumulative effect.

This screening threshold distance was developed based on stationary source noise attenuation equations (Caltrans, 2013). **Table 4.12-14** presents the combined noise level generated by typical construction phases for a given project (assuming multiple pieces of equipment) at a distance of 50 feet. Using the attenuation equations, the maximum noise level of 89 A-weighted decibels (dBA) for both excavation and finishing phases (as shown in **Table 4.12-14**) would diminish to 69 dBA at 500 feet. A receptor experiencing noise levels of 89 dBA from two adjacent construction sites would experience a cumulative noise level of 91 dBA (the acoustical sum of

89 dBA plus 89 dBA. A receptor experiencing noise levels of 89 dBA from one adjacent construction site and another at a distance of 500 feet would experience a cumulative noise level of 89.04 dBA (the acoustical sum of 89 dBA plus 69 dBA), which would not represent a statistically significant increase and, hence, is the derivation of the 500 foot distance used as the geographic scope. A receptor at the mid-point of this distance (250 feet) would experience the equivalent of 75 dBA from each construction site with a resultant 3 dBA increase in noise which is characterized as a barely perceptible noise increase. Intervening structures would further lessen the realized contribution of another construction site at a given receptor.

TABLE 4.12-14
TYPICAL CONSTRUCTION NOISE LEVELS

Construction Phase	Noise Level[a] (dBA, Leq)
Ground clearing	84
Excavation	89
Foundations	78
Erection	85
Finishing	89

NOTES:
dBA = A-weighted decibels, Leq = average noise exposure level for the given time period
a Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

SOURCE: Bolt, Baranek, and Newman, 1971; Cunniff, 1977.

Noise impacts associated with MPWSP would result from construction-related equipment and hauling activities. The timeframe during which the MPWSP could contribute to cumulative noise and vibration effects includes the 24-month construction phase.

Table 4.1-2 includes 18 projects that would potentially occur within the geographic scope of analysis for cumulative noise and vibration impacts (i.e., 500 feet from a MPWSP project component). Eight of these cumulative projects (Nos. 3, 7, 10, 12, 18, 31, 35, and 38) would have a construction schedule that could overlap with that of the MPWSP, meaning that equipment required for cumulative project construction within 500 feet of the MPWSP could be in operation at the same time as that required for MPWSP construction. Sensitive receptors within 500 feet of active cumulative project and MPWSP construction sites could experience a cumulative impact related to construction noise and so are analyzed further to determine whether a significant cumulative impact would occur.

For these eight projects that could contribute to cumulative construction noise impacts based on the screening distance threshold or timing, the potential for cumulative construction noise impacts is assessed based on the same project-level thresholds used in Section 4.12.5, Approach to Analysis. However, this analysis considers the incremental contribution of MPWSP construction noise as well as that of the cumulative project(s). For daytime construction activities, a significant noise impact would occur if noise levels at sensitive noise receptors remained above the 70 dBA speech interference threshold for longer than two consecutive weeks. For nighttime construction activities, a significant noise impact would occur if noise levels at sensitive noise receptors exceeded the sleep interference threshold of 60 dBA during nighttime hours (10:00 p.m. to 7:00 a.m.).

MPWSP components that could generate construction noise in excess of the daytime standard include the ASR Wells, and the Carmel Valley Pump Station. These daytime noise impacts would be reduced to a less-than-significant level through implementation of **Mitigation Measures 4.12-1a (Neighborhood Notice)** and **4.12-1b (General Noise Controls for Construction Equipment)** and for the ASR Wells, **Mitigation Measures 4.12-1d (Additional Noise Controls for ASR-5 and ASR-6 Wells)** and **4.12-1e (Offsite Accommodations for Substantially Affected Receptors)**.

MPWSP components that could generate construction noise in excess of the nighttime standard include the Desalinated Water Pipeline, Castroville Pipeline, the new Transmission main, and the ASR Wells. Nighttime noise impacts from the Desalinated Water Pipeline and the new Transmission Main would be reduced to a less-than-significant level through implementation of **Mitigation Measures 4.12-1a (Neighborhood Notice)**, **4.12-1b (General Noise Controls for Construction Equipment)**, and **4.12-1c (Noise Control Plan for Nighttime Pipeline Construction).** The Castroville Pipeline and ASR wells would have a residual significant and unavoidable impact, even with implementation of **Mitigation Measures 4.12-1a (Neighborhood Notice)**, **4.12-1b (General Noise Controls for Construction Equipment)**, and **4.12-1c (Noise Control Plan for Nighttime Pipeline Construction)** and the addition of **Mitigation Measures 4.12-1d (Additional Noise Controls for ASR-5 and ASR-6 Wells)** and **4.12-1e (Offsite Accommodations for Substantially Affected Receptors)**.

Construction-related noise from the eight above-referenced cumulative projects could combine with that of the MPWSP pipeline construction to cause a cumulative impact. MPWSP pipeline construction would progress at a rate of approximately 150 to 250 feet per day, thereby limiting the potential for a noticeable concurrent construction noise impact at any given receptor to less than a week. Given this limited duration of potential concurrent activity, and associated combined noise effects, the MPWSP would not contribute considerably to a significant cumulative daytime noise impact (*less than significant*).

Of the eight cumulative projects identified above, five are private development projects or specific plans (Nos. 3, 7, 10, 12, and 18) whose construction would not typically require nighttime construction work. The remaining three cumulative projects (Nos. 31, 35, and 38) are water- and transit-related infrastructure projects that could conceivably involve nighttime work to avoid daytime traffic impacts on major arterial roadways. None of these cumulative projects would be within 500 feet of the ASR wells but would be within this distance of MPWSP pipelines.

In the absence of detailed information regarding cumulative project construction equipment and exact construction phase timing, a quantitative assessment of cumulative nighttime noise impact cannot be reasonably estimated. However, it is conservatively assumed that the potential exists for residual (post-mitigation) MPWSP pipeline construction noise to combine with that of one or more of these five cumulative projects to cause nighttime noise levels to exceed the sleep interference threshold. As a result, temporary cumulative increases in nighttime construction noise could result in a significant cumulative nighttime noise impact. No additional mitigation within the scope of this EIR/EIS is available to further reduce the potential for a significant cumulative nighttime noise impact. Therefore, MPWSP nighttime construction noise could have a significant contribution to a significant cumulative effect (*significant and unavoidable*).

Construction Vibration Impacts

The geographic scope of analysis for cumulative vibration impacts is defined by the presence of sensitive structures within 120 feet of MPWSP components whose construction-related vibration could cause damage to these structures. Such components include the proposed subsurface slant wells, the proposed pipelines, the MPWSP Desalination Plant, ASR-5 and ASR-6 Wells, pump station, and other project facilities. Beyond 120 feet, the MPWSP's contributions to cumulative vibration impacts would be greatly attenuated and not be expected to combine with that of cumulative projects to result in a significant cumulative effect.

This vibration screening threshold distance was developed based on the vibration levels of a vibratory compactor, a type of construction equipment used for compacting fill over pipeline trenches, and which would generate the highest vibration of any non-impact construction equipment that would be used for MPWSP construction. At a distance of 60 feet, vibration from a vibratory roller/compactor would be 0.056 inches/second Peak Particle Velocity (PPV). Assuming operation of a compactor at the MPWSP component site and one at a cumulative project site at a distance of 120 feet, the resultant vibration level would be 0.11 inches/second PPV which could be experienced by a mid-point receptor within the 120-foot screening distance. This vibration level would be below the 0.12 inches/second PPV threshold applied in Section 4.12.5, and hence is used to justify the use of a 120-foot geographic scope, beyond which no cumulative vibration effect would result.

Impact 4.12-3 identifies significant project-level construction impacts from operation of roller/compactors and sheet pile drivers during pipeline installation. **Mitigation Measure 4.12-3 (Vibration Reduction Measures)** is identified to address construction-related vibration during pipeline installation activities and includes monitoring. With mitigation, project vibration levels would not exceed 0.12 inches/second PPV.

Ten of the cumulative projects (Nos. 3, 7, 10, 12, 18, 31, 35, 38, 55, and 63) would potentially occur within the 120-foot geographic scope of cumulative impacts analysis. Four of these cumulative projects (Nos. 31, 35, 55, and 63) would not be located within 120 feet of any sensitive receptors or structures and, therefore, would not contribute to cumulative impacts. Without knowledge of the type of construction equipment or exact construction phase timing for the remaining six cumulative projects, a quantitative assessment of vibration impact cannot be reliably estimated. However, the project-specific vibratory impact monitoring proposed under **Mitigation Measure 4.12-3** would also capture vibration contributed by the other six cumulative projects, should the timing and location of construction overlap, and allow the MPWSP construction to respond accordingly (i.e., use smaller equipment, adjust equipment operations, and/or alternate construction methods) to avoid significant vibratory effects. Consequently, the cumulative construction-related vibration impact would be less than significant with mitigation.

Operational Noise Impacts

The geographic scope of analysis for cumulative operational noise impacts is similar to that described above for construction noise (i.e., the presence of sensitive receptors within 500 feet of MPWSP components that could generate operational noise and cumulative projects). The 500-foot screening distance described for construction noise is conservative, as operational noise levels would be lower than construction-related noise levels. Such MPWSP components include the proposed MPWSP Desalination Plant, the ASR well facilities, Main System-Hidden Hills Interconnection Improvements, and the Carmel Valley Pump Station. The timeframe during which the MPWSP could contribute to cumulative operational noise effects includes the anticipated approximately 40-year operations phase.

As discussed in Impact 4.12-5, the MPWSP's project-specific operational noise impacts would be less than significant for the MPWSP Desalination Plant and the Carmel Valley Pump Station. Impacts of the ASR well facilities and the Main System-Hidden Hills Interconnection Improvements would be less than significant with mitigation. There are no cumulative projects within 500 feet of the MPWSP Desalination Plant, the ASR well facilities, Main System-Hidden Hills Interconnection Improvements, or the Carmel Valley Pump Station. Therefore, no other projects could combine with the operational noise effects of the proposed project and the cumulative impact would be less than significant.

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4.13 Public Services and Utilities

This section evaluates the potential impacts on public services and utilities resulting from implementation of the Monterey Peninsula Water Supply Project (MPWSP or proposed project). Public services in the project area include fire and police protection, emergency medical services, hospitals, and schools. Public utilities in the project area provide solid waste disposal, water, wastewater, stormwater drainage, electricity, natural gas, and telecommunications services. This section also presents mitigation measures to reduce or eliminate potential impacts, as appropriate.

Comments received on the 2015 Draft EIR requested that a copy of the 2015 E2 Consulting Engineers Technical Memorandum: Groundwater Replenishment Project Evaluation of Existing Outfall be made available for review (and direct the public to its location), and that additional information about the pipeline be included in the EIR/EIS; the comment is addressed in Impact 4.13-5. In addition, comments requested that ***Mitigation Measure 4.13-1e*** *be modified to require coordination with local fire departments when work is proposed near a gas utility line; the comment has been addressed in* ***Mitigation Measure 4.13-1e****. Comments also requested that* ***Mitigation Measures 4.13-5a*** *and* ***5b*** *address the potential need for lining the MRWPCA outfall and include a discussion of potential secondary impacts related to lining activities and outfall maintenance; the comment has been addressed in Impact 4.13-5, Section 4.13.5.3, Secondary Impacts of Mitigation Measure 4.13-5a, and Section 4.13.5.4 Secondary Impacts of Mitigation Measure 4.13-5b.*

As a result of comments received on the January 2017 Draft EIR/EIS, revisions have been made to this EIR/EIS section. Those changes include:

- *Inclusion of Presidio of Monterey Fire and Police Departments to the list of service providers;*
- *Reference to Impact 4.7-2 in Section 4.7, Hazards and Hazardous Materials where testing and disposal of hazardous construction wastes is addressed;*
- *Revision of Mitigation Measures 4.13-5a and 5b, to include projection measures for the MRWPCA land and ocean outfall segments; and,*
- *Revisions of secondary effects of Mitigation Measures 4.13-5a and 5b.*

4.13.1 Setting / Affected Environment

The study area for evaluation of impacts on public services and utilities includes the service areas for the public services and utilities that serve the project area. Information on public services and utilities in the project area was derived from available planning documents, public utility websites, and consultation with local agency personnel. **Table 4.13-1** shows the jurisdictions within which the project components would be located and summarizes utility and public service providers in the project area.

4.13.1.1 Fire Protection, Law Enforcement, and Emergency Services

Fire Protection

Several local agencies provide fire protection service in the project area. Most of these agencies serve more than one jurisdiction or area.

Unincorporated Monterey County

Two agencies provide fire protection service to the unincorporated area. The North County Fire Protection District serves the unincorporated area north of the city of Marina, which includes the area where the Castroville Pipeline would be installed (NCFPD, 2013). The Monterey County Regional Fire District (MCRFD) serves approximately 350 square miles east of the City of Marina, including the former Fort Ord military base and areas southeast of the City of Monterey. The MCRFD provides emergency medical and fire protection services (MCRFD, 2016).

City of Marina

The Marina Fire Department serves the city of Marina as well as the parts of the former Fort Ord military base that were deeded to Marina (City of Marina, 2016).

Cities of Seaside and Del Rey Oaks

The Seaside Fire Department provides both emergency response and fire prevention services to the City of Seaside; the Department also provides these services on a contractual basis to the city of Del Rey Oaks and parts of the former Fort Ord military base that were deeded to Seaside (Seaside Fire Department, 2014).

City of Monterey

The City of Monterey Fire Department provides fire protection to the city of Monterey and all areas within its jurisdictional boundaries, including the Army Defense Language Institute and Foreign Language Center, the Presidio of Monterey, and the Naval Postgraduate School and its housing at La Mesa Village (City of Monterey, 2016).

U.S. Army

The Presidio of Monterey Fire Department serves all Army property on the Ord Military Community and Presidio of Monterey, as well as holding mutual aid agreements with Seaside, Marina, the California State University of Monterey Bay, and the Monterey County Regional Fire District.

TABLE 4.13-1
LOCAL UTILITY AND PUBLIC SERVICE PROVIDERS, BY JURISDICTION

Jurisdiction/ Project Component	Presidio of Monterey Fire Department	Presidio of Monterey Police Department	Monterey County Regional Fire District	Monterey County Sheriff's Office	North County Fire Protection District	Monterey Regional Waste Management District	Monterey Regional Water Pollution Control Agency	Monterey County Water Resources Agency	Monterey Peninsula Water Management District	Monterey Peninsula Unified School District	Pacific Gas and Electric Company	California American Water Company	Marina Fire Department	Marina Police Department	Marina Coast Water District	Seaside Fire Department	Seaside Police Department	Seaside County Sanitation District	City of Monterey Fire Department	City of Monterey Police Department	North Monterey County Unified School District	Carmel Unified School District
Unincorporated Monterey County *Source Water Pipeline* *MPWSP Desalination Plant* *New Desalinated Water Pipeline* *Brine Discharge Pipeline/Brine Mixing Box* *Pipeline to CSIP Pond* *Castroville Pipeline* *Carmel Valley Pump Station* *Main System–Hidden Hills Interconnection Improvements* *Ryan Ranch–Bishop Interconnection Improvements*			✓	✓	✓	✓	✓	✓	✓		✓	✓									✓	✓
City of Marina *Subsurface Slant Wells* *Source Water Pipeline* *New Desalinated Water Pipeline* *New Transmission Main*	✓					✓	✓	✓	✓	✓	✓		✓	✓	✓							
City of Seaside *New Transmission Main* *ASR Pipelines*	✓					✓	✓	✓	✓	✓	✓	✓				✓	✓	✓				
U.S. Army[a] *New Transmission Main* *ASR-5 and ASR-6 Wells* *ASR Pipelines*	✓	✓					✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓				
City of Monterey *Ryan Ranch–Bishop Interconnection Improvements*	✓					✓	✓	✓	✓	✓	✓	✓						✓	✓	✓		
Castroville CSD *Castroville Pipeline*				✓	✓	✓	✓	✓			✓										✓	

NOTE:
[a] Project components are proposed for the U.S. Army-owned property at the Ord Military Community (OMC) in Seaside, CA.

Police

The Monterey County Sheriff's Office operates the county jail facilities and provides police services to nearly the entire unincorporated county area (Monterey Sheriff, 2016). The cities of Marina, Monterey, Pacific Grove, and Seaside each have an independent police force that serves the areas within their city limits. The Seaside and Marina Police Departments also serve the annexed portions of the former Ford Ord military base.

U.S. Army

The Presidio of Monterey Police Department serves all Army property on the Ord Military Community and Presidio of Monterey.

Emergency Medical Services

The Monterey County Emergency Medical Services Agency is a Monterey County Health Department agency that incorporates over 100 participating entities under one jurisdictional authority, including fire departments, ambulance companies, hospitals, and police departments (MCEMSA, 2014). Monterey County has four major hospitals: Community Hospital of the Monterey Peninsula in Monterey, Natividad Medical Center in Salinas, Salinas Valley Memorial Hospital in Salinas, and George L. Mee Memorial Hospital in King City (Monterey County, 2016).

4.13.1.2 Schools and Libraries

Schools

Three school districts -- the Monterey Peninsula Unified School District, the North Monterey County Unified School District, and the Carmel Unified School District-- serve the project area. The Monterey Peninsula Unified School District serves the cities of Marina, Seaside, Sand City, Del Rey Oaks, and Monterey, as well as the former Fort Ord military base (MPUSD, 2016). The North Monterey County Unified School District serves northern communities in unincorporated Monterey County, including Castroville and Prunedale (NMCUSD, 2016).

Libraries

The project area is served by two library systems: Monterey County Free Libraries and City of Monterey Public Library. The Monterey County Free Libraries serve all of Monterey County and have branches in the cities of Marina, Seaside, and Castroville (MCFL, 2016).

4.13.1.3 Solid Waste Services

The Monterey Regional Waste Management District manages the Monterey Peninsula's solid waste collection, disposal and recycling system. It also receives and processes most of Monterey County's sewage sludge from the adjacent MRWPCA Regional Wastewater Treatment Plant. The Waste Management District serves an 853-square-mile area and a population of approximately 170,000 people. The service area encompasses the cities of Marina, Seaside, Del Rey Oaks, Monterey, Carmel-by-the-Sea, and Pacific Grove and the unincorporated areas of Big Sur, Carmel Highlands, Carmel Valley, Castroville, Corral De Tierra, Laguna Seca, Moss Landing, Pebble Beach, San Benancio, Sand City, and Toro Park (MRWMD, 2015).

The Waste Management District operates the Monterey Peninsula Landfill, a materials recovery facility, and a transfer station at a 475-acre site north of the city of Marina. All solid waste generated by project construction or operation would be disposed of at the landfill or diverted for recycling or reuse at the materials recovery facility. The landfill operates 6 days per week and is permitted to receive 3,500 tons of waste per day; it has a remaining capacity of approximately 48.5 million cubic yards and is expected to reach its permitted capacity in 2107 (CalRecycle, 2016). The landfill receives approximately 300,000 tons of waste per year, which averages to less than 1,000 tons of waste per day (MRWMD, 2016). In addition to the more commonly recycled and reused materials (such as paper, cardboard, bottles, and cans), materials targeted by operators at the materials recovery facility include commercial waste, wood waste, and yard waste, construction and demolition debris, and materials in self-haul loads (MRWMD, 2015).

4.13.1.4 Water

The water districts and facilities that provide drinking water to residents and businesses in the project area are described below. Some of these districts also provide sewer services and infrastructure (see Section 4.13.1.5).

Marina Coast Water District

The Marina Coast Water District (MCWD) provides water for residents in the city of Marina and to areas within the former Fort Ord military base. The MCWD's water supply comes from three groundwater wells located in the 900-foot-deep aquifer of the Salinas Valley Groundwater Basin (MCWD, 2016a). The MCWD also has a desalination plant with a capacity of 300 acre-feet per year (afy); the plant is capable of providing up to 13 percent of the annual water demand, but has not operated in recent years (MCWD, 2016b).

California American Water Company

As described in Chapter 3, Description of the Proposed Project, California American Water Company (CalAm) supplies water to most of the jurisdictions in the project area (see **Figure 3-1**). CalAm's existing water supply sources for the Monterey District service area are discussed in Chapter 2, Water Demand, Supplies, and Water Rights.

Seaside Municipal Water System

The Seaside Municipal Water System, which is operated and maintained by the City of Seaside, provides water service to a limited number of residents along General Jim Moore Boulevard on the east side of the city. The system includes one groundwater production well and two 500,000-gallon water tanks (City of Seaside, 2016).

Castroville Community Services District

The Castroville Community Services District provides water to more than 7,250 customers via three domestic water production wells with an estimated capacity of over 4.4 mgd. The water system includes two water storage tanks with a capacity of 1.1 million gallons (Castroville CSD, 2016a).

4.13.1.5 Wastewater Treatment

Two wastewater treatment providers serve the project area: the Monterey Regional Water Pollution Control Agency (MRWPCA) and the Carmel Area Wastewater District.

Monterey Regional Water Pollution Control Agency

The MRWPCA operates the Regional Wastewater Treatment Plant, which is north of the city of Marina and east of the proposed MPWSP Desalination Plant site on Charles Benson Road. The MRWPCA is Monterey County's primary provider of wastewater treatment. The MRWPCA serves the communities of Pacific Grove, Monterey, Del Rey Oaks, Seaside, Sand City, Marina, Castroville, Moss Landing, Boronda, Salinas, and Fort Ord and some unincorporated areas in northern Monterey County (MRWPCA, 2016a); sewer infrastructure is maintained and managed by the Marina Coast Water District, the City of Monterey, the Seaside County Sanitation District, the Castroville Sanitary District, and the MRWPCA. The MRWPCA maintains 25 pump stations and approximately 30 miles of pipeline (MRWPCA, 2016b). The MRWPCA also operates a water recycling facility at the treatment plant and along with the Monterey County Water Resources Agency, manages the recycled water distribution system including the Salinas Valley Reclamation Project and the Castroville Seawater Intrusion Project (CSIP). The recycled water is then distributed to Salinas Valley agricultural growers for irrigation use. Excess wastewater receives secondary treatment before being discharged to Monterey Bay via the existing MRWPCA ocean outfall and diffuser (MRWPCA, 2016c), which would also be used for the proposed project brine discharge.

Carmel Area Wastewater District

The Carmel Area Wastewater District provides wastewater collection, treatment, and disposal for a 5.5-mile service area that encompasses Carmel-by-the-Sea and outlying county areas from Carmel Bay to the west, Carmel Highlands to the south, and Del Monte Forest to the north. The district serves a population of approximately 11,000 people. The district's treatment plant, located on the south bank of the Carmel River west of Highway 1, includes a facility that recycles water for irrigation use at several golf courses, including Pebble Beach, Poppy Hills, and Spanish Bay (Carmel Area Wastewater District, 2016).

4.13.1.6 Stormwater Drainage

Monterey County

Monterey County Water Resources Agency operates and maintains drainage facilities in 14 drainage maintenance zones and districts throughout Monterey County. The stormwater drainage system is composed of approximately 57 miles of drainage ways (e.g., streams, drainage ditches, and drainage channels); eight pump stations; nine miles of river levees; two large earthen dams; and numerous culverts, tide gates, and concrete structures (MCWRA, 2016).

Cities of Monterey and Seaside

The City of Monterey and the City of Seaside maintain stormwater conveyance infrastructure and natural drainage courses for their respective jurisdictions.

Castroville Community Services District

The Castroville Community Services District maintains 16 miles of storm drain main lines, four stormwater treatment units (for removing trash, debris and hydrocarbons), and 178 catch basins within its storm drain system (Castroville CSD, 2016b).

4.13.1.7 Electricity, Natural Gas, and Telecommunications

Pacific Gas and Electric Company (PG&E) provides electricity and natural gas to all of Monterey County, and Pacific Bell provides telephone service. Section 4.18, Energy Conservation, presents more information on PG&E service in the project area.

4.13.2 Regulatory Framework

This section provides an overview of notable federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as “regulatory requirements”) relevant to public services and utilities. A brief summary of each is provided, along with a finding regarding the project’s conformity with those regulatory requirements. The conformity findings concern the project as proposed, without mitigation. Where the project, as proposed, would be consistent with an applicable regulatory requirement, no further discussion of project consistency with that regulatory requirement is provided. Where the project, as proposed, would be potentially inconsistent with an applicable regulatory requirement, the reader is referred to a specific impact topic within Section 4.13.5, Direct and Indirect Effects of the Proposed Project. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

4.13.2.1 Federal Regulations

There are no federal regulations that pertain to Public Services and Utilities that are applicable to the proposed project.

4.13.2.2 State Regulations

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) was enacted by the State Legislature in 1976 to provide for the long-term management of lands within California's coastal zone boundary. The Coastal Act includes specific policies for management of natural resources and public access within the coastal zone. Of primary relevance to public services and utilities is a Coastal Act policy concerning designing and limiting new or expanded public works facilities such that they (and the needs/growth they accommodate) are protective of coastal resources. This subsection provides a preliminary assessment of MPWSP consistency with these priorities. Final determinations regarding project consistency are reserved for the Coastal Commission. The MPWSP has been designed to accommodate existing and projected future demand consistent with the General Plans (and Local Coastal Programs) of the jurisdictions in CalAm's service area. As future development in the service area would need to be consistent with General Plan and Local Coastal Program requirements, the project would not conflict with Coastal Act policies related to public works facilities.

The California Coastal Act contains numerous enforceable policies that are directed at protecting and, where feasible, restoring coastal water quality. The California Coastal Commission applies the Coastal Act's water quality policies when reviewing applications for coastal development permits in California state waters. The Coastal Commission also applies the water quality policies when reviewing federally licensed and permitted activities to ensure they are consistent with the State's coastal management program in accordance with the Coastal Zone Management Act federal consistency provision.

The Coastal Commission considers an application for a coastal development permit to cover the requirement for an applicant submitting a consistency certification to the Coastal Commission if the activity is located in state waters. Typically, the Coastal Commission will provide its response (concurrence, conditional concurrence, or objection) in its staff report for the coastal development permit.

California Public Utilities Commission

The California Public Utilities Commission (CPUC)—the CEQA lead agency for this project—is responsible for ensuring that investor-owned (private) water, energy, and telecommunications utilities deliver safe, clean, and/or reliable services to customers at reasonable rates. The CPUC does not regulate publicly-owned utilities. The CPUC regulates CalAm, the project applicant.

California Integrated Waste Management Act of 1989 and Assembly Bill 341

The California Integrated Waste Management Board (CIWMB) oversees, manages, and tracks waste generated in California. The authority and responsibilities of the CIWMB were promulgated in Assembly Bill 939 and Senate Bill 1322, which were signed into law as the California Integrated Waste Management Act of 1989 (Public Resources Code [PRC], Division 30). The California Integrated Waste Management Act, as modified by subsequent legislation, mandated all California cities and counties to implement programs to reduce, recycle, and compost at least 50 percent of wastes by 2000 (PRC Section 41780). In January 2010, the CIWMB changed its name to the Department of Resources, Recycling, and Recovery (CalRecycle).

Assembly Bill 341, which amends the Integrated Waste Management Act of 1989 and was adopted by the California legislature in October 2011, directs CalRecycle to adopt a state policy that actively seeks to achieve a goal of diverting 75 percent of solid waste from landfills by 2020. The new legislation focuses largely on commercial waste generators, as this sector was identified as the most in need of improved waste management. Assembly Bill 341 does not alter the 50 percent diversion mandate; rather, it is a "legislative declaration of policy" to guide CalRecycle's administration of the California Integrated Waste Management Act (Theroux, 2012).

A jurisdiction's diversion rate is the percentage of total generated waste it diverts from disposal through source reduction, reuse, and recycling programs. The state determines compliance with the 50 percent diversion mandate through a complex formula. Use of the formula requires cities and counties to conduct empirical studies to establish a base-year waste generation rate against which future diversion is measured. The diversion rate in subsequent years is determined through deduction instead of direct measurement. Rather than counting the amount of material recycled and composted, the city or county tracks the amount of material disposed of at landfills and then subtracts that amount from the base-year amount; the difference is assumed to be diverted (PRC Section 41780.2).

Construction of the MPWSP project components would potentially be inconsistent with the California Integrated Waste Management Act of 1989 and Assembly Bill 341 because the total volume of construction wastes and excess spoils could be landfilled if not recycled properly. This issue is discussed in Impact 4.13-2 below.

Utility Notification Requirements

California law (Government Code Section 4216 et seq.) requires owners and operators of underground utilities to become members of, participate in, and share the costs of a regional notification center. Government Code Section 4216 requires that persons planning to conduct any excavation contact the regional notification center. Section 4216 includes several related requirements, including requirements for excavations near "high priority subsurface installation", or high risk facilities, which include high-pressure natural gas pipelines and other pipelines that are potentially hazardous to workers or the public if damaged or ruptured. Underground Service Alert North (USA North) is the notification center for the project area. USA North receives planned excavation reports and transmits the information to all participating members that may have underground facilities at the location of excavation. The USA North members will then mark or stake their facility, provide information about the location, or advise the excavator of clearance (USA North, 2016).

Construction of the MPWSP would be potentially inconsistent with California's Utility Notification Requirements (Government Code Section 4216 et seq.) because CalAm's construction contractors could conduct excavations without sufficient notification to owners and operators of utilities or proper planning when in the vicinity of high priority subsurface installations. This issue is discussed in Impact 4.13-1.

NPDES Waste Discharge Program

The National Pollution Discharge Elimination System (NPDES) waste discharge requirements and the NPDES Permit for MRWPCA Regional Wastewater Treatment Plant are discussed in Section 4.3.2.2, State Regulations.

4.13.2.3 Local Regulations

Table 4.13-2 describes the state, regional, and local land use plans, policies, and regulations pertaining to public services and utilities that are relevant to the proposed MPWSP and that were adopted for the purpose of avoiding or mitigating an environmental effect. Also included in **Table 4.13-2** is an analysis of project consistency with such plans, policies, and regulations. Where the analysis concludes the proposed project would not conflict with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes the proposed project may conflict with the applicable plan, policy, or regulation, the reader is referred to Section 4.13.5, Direct and Indirect Effects of the Proposed Project. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

Monterey County Integrated Waste Management Plan

The Monterey County Integrated Waste Management Plan incorporates relevant provisions of the California Green Building Standards Code, which Monterey County has adopted. Diversion rates related to construction are from the California Green Building Standards Code. Section 5.408.1 of the code requires non-residential projects to recycle and/or salvage for reuse a minimum of 50 percent of nonhazardous construction and demolition waste. Further, Section 5.408.3 requires that 100 percent of trees, stumps, rocks, and associated vegetation and soils resulting primarily from land clearing be reused or recycled (unless the vegetation or soil is contaminated with disease or pest infestation.) CalRecycle reviews the Monterey County Integrated Waste Management Plan every 5 years, most recently in December 2012. The latest update to the Integrated Waste Management Plan ensures compliance with all current regulatory and reporting requirements (MCHD, 2012).

Construction of all MPWSP project components would potentially be inconsistent with the Monterey County Integrated Waste Management Plan because the total volume of nonhazardous construction wastes and excess spoils could be landfilled if not recycled properly. This issue is discussed in Impact 4.13-2 below.

TABLE 4.13-2
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO PUBLIC SERVICES AND UTILITIES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Infrastructure	Subsurface Slant Wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 3.3:*** The intent of the General Plan Transportation and Infrastructure Element is to ensure that the requirements for transportation, water supply, wastewater collection and treatment, storm water drainage, and solid-waste disposal generated by existing and future development are adequately provided for. It is also the intent of this section to ensure, to the maximum extent possible, that the provision of such services does not have a deleterious effect on either natural resources or the quality of life of residents of Marina or other potentially affected areas. The major concerns of this section are outlined below: 11. Minimize the consumption of water for urban purposes and make maximum possible use of recycled water. 12. Design stormwater runoff facilities so as to the recharge ground water aquifers while protecting the water quality of these aquifers. 13. Ensure long-term availability of required facilities and services prior to approval of new construction. 14. Support water resource programs, including desalinization and reclamation efforts, to provide an adequate water supply to accommodate General Plan permitted growth. 15. Promote reductions in the generation of non-recyclable solid waste.	The intent of this policy is to ensure sufficient and environmentally responsible provision of public utilities for existing and future development.	<u>Consistent:</u> The purpose of the MPWSP is to replace those portions of CalAm's existing supplies that have been constrained by legal decisions regarding diversions from the Carmel River and pumping from the Seaside Groundwater Basin. The proposed project would provide a reliable water supply to meet existing demands and would accommodate the demands of some new development. The pipelines are sized to accommodate growth, with new pumping. The proposed project would be required to comply with State and local regulations regarding stormwater management, waste diversion, and recycling.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Land Use	Subsurface Slant Wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 2.4*:** The intent of the community land use element is to help achieve the overall General Plan goals of providing a satisfying, safe and healthful living and working environment and promoting the economic well-being of city residents and businesses. To accomplish these ends, City planning, regulatory and development decisions shall be governed by the following policies which adhere to the goals in the "Introduction" (Chapter 1). 13. The City will provide adequate urban services, including water, only to areas within its designated Urban Growth Boundary. The costs of providing the public facilities and services needed for new development shall be borne by new development unless the City chooses to help assume such costs in order to obtain identified community-wide benefits.	The intent of this policy is to encourage growth in urban areas and minimize impacts of development in areas outside the urban growth boundary.	<u>Consistent:</u> The subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main are within the Marina Urban Growth Boundary and would not require the need for urban services expansion.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Water Supply, Treatment, and Distribution	New Transmission Main; ASR Conveyance Pipeline; ASR Pump-to-Waste Pipeline; and ASR Recirculation Pipeline	***Policy LU-5.2:*** Work cooperatively with local and regional water suppliers to ensure adequate water reserves.	The intent of this policy is to ensure adequate local and regional water supplies.	<u>Consistent:</u> The purpose of the MPWSP is to provide water supplies for those portions of CalAm's existing supplies that have been constrained by legal decisions regarding CalAm's diversions from the Carmel River and pumping from the Seaside Groundwater Basin. Therefore this project would ensure an adequate local and regional water supply.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Water Supply, Treatment, and Distribution	New Transmission Main; ASR Conveyance Pipeline; ASR Pump-to-Waste Pipeline; and ASR Recirculation Pipeline	***Policy LU-5.3:*** Actively promote water conservation by City residents and businesses	This policy is intended to promote water conservation	<u>Consistent:</u> The purpose of the MPWSP is to provide water supplies for those portions of CalAm's existing supplies that have been constrained by legal decisions regarding CalAm's diversions from the Carmel River and pumping from the Seaside Groundwater Basin. The results of ongoing conservation efforts are considered in the sizing of the proposed project and nothing about the MPWSP would decrease those efforts to conserve water.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Sewer Collection and Treatment	New Transmission Main; ASR Conveyance Pipeline; ASR Pump-to-Waste Pipeline; and ASR Recirculation Pipeline	***Policy LU-6.1:*** Maintain the existing sewer system to provide a high level of service to community neighborhoods.	This policy is intended to maintain a high level of service for the sewer system.	<u>Potentially inconsistent:</u> Pipeline installation could temporarily impact sewer service. This issue is addressed in Impact 4.13-1 below.

TABLE 4.13-2 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO PUBLIC SERVICES AND UTILITIES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Public Services	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Carmel Valley Pump Station, and Main System-Hidden Hills and Ryan Ranch–Bishop Interconnection Improvements	***Policy PS-2.1*:** Coordination among, and consolidation with, those public water service providers drawing from a common water table to prevent overdrawing the water table is encouraged.	This policy is intended to prevent overdrawing of the aquifers.	<u>Consistent:</u> The proposed project is being planned in coordination with public water service providers in the region and includes measures to prevent overdrawing the water table.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Public Services	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, and Main System-Hidden Hills and Ryan Ranch–Bishop Interconnection Improvements	***Policy PS-5.5*:** The County shall promote waste diversion and recycling and waste energy recovery.	This policy is intended to reduce waste.	<u>Consistent:</u> The proposed project would be required to comply with State and local regulations that require waste diversion and recycling.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Public Services	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline/Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, and Main System-Hidden Hills and Ryan Ranch–Bishop Interconnection Improvements	***Policy PS-13.2*:** All new utility lines shall be placed underground, unless determined not to be feasible by the Director of the Resource Management Agency.	This policy is intended to minimize visual and other adverse effects of above-ground utility lines.	<u>Consistent:</u> The proposed project includes underground water conveyance pipelines. New underground and aboveground powerlines would be constructed between existing powerlines in the area and the proposed project facilities. It is anticipated that most, if not all, of the new powerlines would be constructed underground.
County of Monterey (inland areas)	North County Area Plan	Public Services	Castroville Pipeline	**NC-5.2:** Water development projects that can offer a viable water supply to water-deficient areas in North County shall be a high priority.	This policy is intended to provide a viable water supply to water deficient parts of North County	<u>Consistent:</u> The proposed project contributes water supplies to the Castroville Seawater Intrusion Project, therefore, it would provide a viable water supply to water deficient parts of North County.

SOURCES: City of Marina, 2006; City of Seaside, 2004; Monterey County, 1985, 2010.

4.13.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to public services and utilities if it would:

- Disrupt operations or require relocation of regional or local utilities;
- Result in the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any public services such as fire and police protection, schools, parks, or other public facilities;
- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Require or result in the construction of new water or wastewater treatment facilities or the expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new stormwater drainage facilities or the expansion of existing facilities, the construction of which could cause significant environmental effects;
- Have insufficient water supply available to serve the project from existing entitlements and resources or require new or expanded water supply resources or entitlements;
- Result in a determination by the wastewater treatment provider that it has inadequate capacity, including treatment and/or outfall capacity, to accommodate the project's projected demand;
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs; or
- Be out of compliance with federal, state, and local statutes and regulations related to solid waste; or
- Generate wastewater flows that would increase the corrosion of the existing MRWPCA outfall and diffuser.

4.13.4 Approach to Analysis

Streets and trails through the project area function as underground utility corridors. Several impacts of the MPWSP related to public services and utilities stem from the potential for project construction to directly impact utilities and utility services. Therefore, the analysis of project impacts in Sections 4.13.5.1 and 4.13.5.2, below, focus on impacts on utilities, although potential impacts related to public services are also addressed.

This analysis uses the California Department of Transportation (Caltrans) policy in the Caltrans Project Development Procedures Manual (Caltrans, 1999) to identify "high risk" utilities that would pose a greater risk to workers and the public should an accident occur during construction, and which therefore warrant special consideration. Pursuant to the policy, high risk utilities include pipelines carrying petroleum products, oxygen, chlorine, toxic or flammable gases;

natural gas in pipelines greater than 6 inches nominal pipe diameter or with normal operating pressures greater than 60 pounds per square inch gauge; and underground electric supply lines, conductors, or cables that have a potential to ground more than 300 volts, either directly buried or in duct or conduit, and which do not have effectively grounded metal shields or sheaths (Caltrans, 1999).

4.13.5 Direct and Indirect Effects of the Proposed Project

Due to the nature of the proposed project, the following criteria are not addressed in the impact analysis sections for the reasons described below:

Result in the need for new or physically altered governmental facilities. During the 30 month construction period, up to 380 construction workers would be employed at the various construction sites, depending on the phase of construction and the construction activities taking place. It is expected that construction workers could come from any part of the region. While it is possible that some workers might temporarily relocate from other areas, the proposed project would not substantially increase the local population. During project construction, incidents requiring law enforcement, fire protection, or emergency services could occur; however, any temporary increase in incidents would not exceed the capacity of local and/or regional service providers to a degree that requires new or expanded facilities. Any temporary increase in the local population during project construction would be negligible and could be accommodated by existing service providers. Therefore, construction of the proposed project would not result in impacts related to the need for new or physically altered governmental facilities in order to maintain existing levels of public services, and no impacts on public services would occur.

The proposed project would not permanently increase the local population. Operation and maintenance activities would require approximately 25 to 30 permanent employees and would not substantially increase the demand for public services, including fire and police protection, libraries, schools, hospitals, or other services. Therefore, no impacts related to public services would occur during project operations. Because there would be no construction or operational impacts, the criterion related to the need for new or modified governmental facilities is not applicable to the project and is not discussed further. The issues of population and housing are discussed in Section 4.19 Population and Housing. The potential impact related to impaired emergency access during construction is addressed under Impact 4.9-4 in Section 4.9, Traffic and Transportation.

Require or result in the construction of new water or wastewater treatment facilities or the expansion of existing facilities, the construction of which could cause significant environmental effects. As described in Chapter 3, Description of the Proposed Project, the MPWSP would develop a new water supply to replace current supplies that are legally constrained. It would not increase volumes of wastewater requiring treatment, and no new or expanded wastewater treatment facilities would result. The construction of water-related facilities, including the MPWSP Desalination Plant, is the subject of this EIR/EIS. Other sections in this Chapter 4, Environmental Setting (Affected Environment), Impacts, and Mitigation Measures discuss the potential impacts and identify mitigation measures associated with these proposed facilities.

Require or result in the construction of new stormwater drainage facilities or the expansion of existing facilities, the construction of which could cause significant

environmental effects. The potential for the proposed project to change drainage patterns and increase stormwater runoff is addressed in Section 4.3, Surface Water Hydrology and Water Quality (see Impacts 4.3-7 and 4.3-8). That analysis indicates that, due to the negligible increase in impervious surfaces associated with the proposed aboveground facilities, the proposed project would have a less than significant impact associated with potential changes in drainage patterns and the rate and amount of surface runoff. As a result, the proposed project would not require or result in the need for new or expanded stormwater drainage facilities. No impact would result and this impact is not discussed further.

Have insufficient water supply available to serve the project or require new or expanded water supply resources or entitlements. Project implementation would generate approximately 25 to 30 permanent jobs in the Monterey District service area. The proposed project would not construct new housing, nor would it substantially increase the number of permanent workers in the area. No substantial changes in water demand or water distribution would result. Further, the purpose of the MPWSP is to provide a new potable water supply source to serve the CalAm Monterey District service area and the implementation of this new water supply is the subject of this EIR/EIS. Therefore, this criterion is not applicable to the project and is not discussed further in this section. Refer to Chapter 2, Water Demand, Supplies, and Water Rights for a discussion of water rights and Section 4.4, Groundwater Resources, for an analysis of the proposed project's effects on existing groundwater users in the Seaside Groundwater Basin and the Salinas Valley Groundwater Basin.

Table 4.13-3 summarizes the MPWSP's impacts and significance determinations related to public services and utilities.

TABLE 4.13-3
SUMMARY OF IMPACTS – PUBLIC SERVICES AND UTILITIES

Impacts	Significance Determinations
Impact 4.13-1: Disrupt or relocate regional or local utilities during construction.	LSM
Impact 4.13-2: Exceed landfill capacity or be out of compliance with federal, state, and local statutes and regulations related to solid waste during construction.	LSM
Impact 4.13-3: Exceed landfill capacity or be out of compliance with federal, state, and local statutes and regulations related to solid waste during operations.	LS
Impact 4.13-4: Exceed wastewater treatment requirements of the Central Coast RWQCB, or result in a determination by the wastewater treatment provider that it has inadequate treatment or outfall capacity to serve the project.	LSM
Impact 4.13-5: Increased corrosion of the MRWPCA outfall as a result of brine discharge associated with project operations.	LSM
Impact 4.13-C: Cumulative impacts related to public services and utilities.	LSM

NOTES:
LS = Less than Significant impact, no mitigation proposed
LSM = Less than Significant impact with Mitigation

4.13.5.1 Construction Impacts

Impact 4.13-1: Disrupt or relocate regional or local utilities during construction. (*Less than Significant with Mitigation*)

All Project Facilities

Construction of the MPWSP could damage or interfere with existing water, sewer, stormwater drainage, natural gas, electric, or communication utility service lines. Construction could require the permanent relocation of these utility lines, potentially interrupting service if the relocation could not be avoided. Numerous public utilities of varying sizes are present in the project area.

Streets and roads typically serve as utility corridors, increasing the potential for project pipelines to interfere with existing utilities. As such, overhead utility lines of various sizes are likely to be located along or across several project components. Overhead utility poles and lines could be susceptible to accidental damage from the movement of large construction equipment and vehicles throughout the project area. Trenching, excavation, and pipeline installation are the activities most likely to result in planned or accidental service disruptions, as the proposed pipeline alignments would probably cross multiple underground utilities. In most cases, service disruptions would be temporary and typically would not exceed 1 day. The proposed pipeline alignments could cross stormwater pipes, culverts, natural gas lines, sewer lines, and water pipelines.

Accidental rupture of or damage to utility lines during project construction could temporarily disrupt utility services and, in the case of high-risk utilities (also referred to as high priority subsurface installations), such as high-pressure gas pipelines, could result in significant safety hazards for construction workers. For these reasons, impacts on existing utilities and utility services during project construction would be potentially significant. However, the impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.13-1a (Locate and Confirm Utility Lines)**, **4.13-1b (Coordinate Final Construction Plans with Affected Utilities)**, **4.13-1c (Safeguard Employees from Potential Accidents Related to Underground Utilities)**, **4.13-1d (Emergency Response Plan)**, **4.13-1e (Notify Local Fire Departments)**, and **4.13-1f (Ensure Prompt Reconnection of Utilities)**. These mitigation measures would require the construction contractor(s) to: confirm the location of existing utilities and mark the confirmed locations accurately on the final construction drawings; work with utility service providers to minimize the risk of damage to existing utility lines and ensure prompt reconnection of service in the event of a service disruption; take special precautions when working near high-risk utility lines, including tailgate meetings with contractor staff on days when work will occur near high risk (high priority) utilities; clearly outline the procedures to follow in the event of a leak or explosion; and immediately notify local fire departments of any damage to high-risk utility lines.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.13.2, Regulatory Framework, construction of certain components of the MPWSP could conflict with applicable regulatory requirements related to public services and utilities. As noted in **Table 4.13-2**, the new

Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline would potentially conflict with the Seaside General Plan Policy LU-6.1 which intends to maintain a high level of sewer system service to its community. CalAm and its construction contractors shall implement **Mitigation Measures 4.13-1a** (**Locate and Confirm Utility Lines)**, **4.13-1b (Coordinate Final Construction Plans with Affected Utilities)**, and **4.13-1f (Ensure Prompt Reconnection of Utilities)** which would resolve any potential conflicts with the aforementioned regulatory requirement.

In addition, construction of the MPWSP would potentially conflict with California's Utility Notification Requirements (Government Code Section 4216 et seq.) which intends to prevent excavations from damaging or rupturing underground utilities, including high priority subsurface installations. CalAm and its construction contractors shall implement **Mitigation Measures 4.13-1a (Locate and Confirm Utility Lines)**, **4.13-1b (Coordinate Final Construction Plans with Affected Utilities)**, **4.13-1c (Safeguard Employees from Potential Accidents Related to Underground Utilities)**, and **4.13-1d (Emergency Response Plan)** which would resolve any potential conflicts with the aforementioned regulatory requirements.

Impact Conclusion

This impact would be significant for all project components but would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.13-1a** through **4.13-1f**.

Mitigation Measures

Mitigation Measure 4.13-1a applies to all project components.

Mitigation Measure 4.13-1a: Locate and Confirm Utility Lines.

Before excavation begins, CalAm or its contractor(s) shall locate all overhead and underground utility lines (such as natural gas, electricity, sewage, telephone, fuel, and water lines) that are reasonably expected to be encountered during excavation. When a project excavation is within the approximate location of a subsurface utility, CalAm or its contractor shall determine the exact location of the underground utility by safe and acceptable means, including the use of hand tools and modern techniques. Information regarding the size, color, and location of existing utilities shall be confirmed before construction activities begin. These utilities shall be highlighted on all construction drawings.

Mitigation Measure 4.13-1b applies to all project components.

Mitigation Measure 4.13-1b: Coordinate Final Construction Plans with Affected Utilities.

CalAm or its contractor(s) shall coordinate final construction plans, schedule, and specifications with affected utilities. Arrangements shall be made with these entities regarding the appropriate protection, relocation, or temporary disconnection of services. If any interruption of service is required, CalAm or its contractor(s) shall notify residents and businesses in the project corridor of any planned utility service disruption at least 2 working days and up to 14 calendar days in advance, in conformance with county and state standards.

Mitigation Measure 4.13-1c applies to all project components.

Mitigation Measure 4.13-1c: Safeguard Employees from Potential Accidents Related to Underground Utilities.

When any excavation is open, the construction contractor(s) shall protect, support, or remove underground utilities as necessary to safeguard employees.

The contractor(s) shall be required to provide weekly updates to CalAm and construction workers regarding the planned excavations for the upcoming week, and to specify when construction will occur near a high-priority utility (i.e., pipelines carrying petroleum products, oxygen, chlorine, or toxic or flammable gases; natural gas pipelines greater than 6 inches in diameter or with normal operating pressures greater than 60 pounds per square inch gauge; and underground electric supply lines, conductors, or cables that have a potential to ground more than 300 volts that do not have effectively grounded sheaths). Construction managers shall hold regular tailgate meetings with construction staff on days when work near high-priority utilities will occur to review all safety measures regarding such excavations, including measures identified in the Mitigation Monitoring and Reporting Program and in construction specifications—. The contractor shall designate a qualified Health and Safety Officer who shall specify a safe distance to work near high-priority utilities. Excavation near such utility lines shall not be authorized until the designated Health and Safety Officer confirms and documents in the construction records that: (1) the line was appropriately located in the field by the utility owner using as-built drawings and a pipeline-locating device; and (2) the location was verified by hand by the construction contractor.

Mitigation Measure 4.13-1d applies to all project components.

Mitigation Measure 4.13-1d: Emergency Response Plan.

Before commencement of construction, CalAm or its contractor(s) shall develop an emergency response plan that outlines procedures to follow in the event of a leak or explosion and submit a copy to the CPUC and MBNMS. The emergency response plan shall identify the names and phone numbers of staff at the potentially affected utilities that would be available 24 hours per day in the event that construction activities cause damage to or rupture of a high-risk utility. The plan shall also detail emergency response protocols, including notification, inspection, and evacuation procedures; any equipment and vendors necessary to respond to an emergency (such as an alarm system); and routine inspection guidelines.

Mitigation Measure 4.13-1e applies to all project components.

Mitigation Measure 4.13-1e: Notify Local Fire Departments.

CalAm or its contractor(s) shall notify local fire departments in advance of any work that is to be performed within or adjacent to a right-of-way that contains a gas utility line, or any time damage to a gas utility line results in a leak or suspected leak, or whenever damage to any utility results in a threat to public safety.

Mitigation Measure 4.13-1f applies to all project components.

Mitigation Measure 4.13-1f: Ensure Prompt Reconnection of Utilities.

CalAm or its contractor(s) shall promptly contact utility providers to reconnect any disconnected utility lines as soon as it is safe to do so.

Impact 4.13-2: Exceed landfill capacity or be out of compliance with federal, state, and local statutes and regulations related to solid waste during construction. (*Less than Significant with Mitigation*)

All Project Facilities

Construction of the proposed project would generate approximately 25,110 cubic yards (37,665 tons) of excess spoils and construction materials that would require transport out of the project area, such as sand, soil, and asphalt. Due to the economic value of clean excavated soil and the cost of landfill disposal, it is expected that much of the excavated materials would be diverted for reuse. Nevertheless, this analysis conservatively assumes that all nonhazardous excess spoils and construction debris would be disposed of at the Monterey Peninsula Landfill. Testing and disposal of hazardous construction wastes is addressed in Impact 4.7-2 in Section 4.7, Hazards and Hazardous Materials.

The Monterey Peninsula Landfill is permitted to receive 3,500 tons of waste per day. The landfill has an estimated remaining capacity of 48,560,000 cubic yards and an expected site life of approximately 100 years (CalRecycle, 2016). According to the Monterey Regional Waste Management District, the landfill receives an average of approximately 300,000 tons per year, or less than 1,000 tons per day (MRWMD, 2016).

Based on the assumption that excess spoils and construction debris would be hauled to the landfill Monday through Friday over the 30-month construction duration, project construction could generate up to 59 tons per day of materials requiring disposal. Even under this worst-case scenario, the waste generated by project construction, in combination with the landfill’s average acceptance rate of less than 1,000 tons per day, would be well below the landfill’s permitted daily acceptance rate of 3,500 tons. The total amount of excess spoils and construction debris generated by the project represents approximately 0.05 percent of the landfill’s remaining capacity. Therefore, even under the worst-case scenario that assumes all of the proposed project’s excess spoils and construction debris would be disposed of at the Monterey Peninsula Landfill, the amount of waste by project construction would not exceed or substantially deplete the landfill capacity. However, failing to divert a substantial portion of the waste generated during project construction could conflict with county and local diversion goals and policies, and could adversely affect the jurisdictions’ waste diversion rates.

As discussed in Section 4.13.2, Regulatory Framework, the California Integrated Waste Management Act of 1989 requires all California cities and counties to implement programs to reduce, recycle, and compost at least 50 percent of waste and the Monterey County Integrated

Waste Management Plan has incorporated provisions of the California Green Building Standards Code, calling for non-residential projects to recycle and/or salvage for reuse of at least 50 percent of nonhazardous construction and demolition waste and that 100 percent of trees, stumps, rocks, and associated vegetation and soil from land clearing be reused or recycled (unless contaminated with disease or pest infestation).

Failure of CalAm's construction contractor(s) to reuse or recycle excavation materials and other construction waste generated during MPWSP construction would thus conflict with the County's Integrated Waste Management Plan policies, and could also adversely affect the state-mandated diversion rates of the jurisdictions in which construction activities would be located; this would be a significant impact.

This impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.13-2 (Construction Waste Reduction and Recycling Plan)**. This measure would require CalAm's construction contractor(s) to prepare and implement a plan to divert recoverable materials from landfills.

Impact Conclusion

Even under the worst case scenario that assumes all of the proposed project's excess spoils and construction debris would be disposed of at the Monterey Peninsula Landfill, the amount of construction waste would not exceed or substantially deplete the landfill capacity. However, disposal and management of wastes generated during project construction could be out of compliance with state and local regulations and policies calling for the diversion of construction waste from landfill disposal, a significant impact. The impact would be mitigated to a less-than-significant level for all project facilities with implementation of **Mitigation Measure 4.13-2 (Construction Waste Reduction and Recycling Plan)**.

Mitigation Measure

Mitigation Measure 4.13-2 applies to all project components.

Mitigation Measure 4.13-2: Construction Waste Reduction and Recycling Plan.

The construction contractor(s) shall prepare and implement a construction waste reduction and recycling plan identifying the types of debris the project will generate and the manner in which those waste streams will be handled. In accordance with the California Integrated Waste Management Act of 1989, the plan shall emphasize source reduction measures, followed by recycling and composting methods, to ensure that construction and demolition waste generated by the project is managed consistent with applicable statutes and regulations. In accordance with the California Green Building Standards Code and local regulations, the plan shall specify that all trees, stumps, rocks, and associated vegetation and soils, and 50 percent of all other nonhazardous construction and demolition waste, be diverted from landfill disposal. The plan shall be prepared in coordination with the Monterey Regional Waste Management District and be consistent with Monterey County's Integrated Waste Management Plan. Upon project completion, CalAm shall collect the receipts from the contractor(s) and submit them to the CPUC as documentation that the waste reduction, recycling, and diversion goals have been met.

4.13.5.2 Operational and Facility Siting Impacts

Impact 4.13-3: Exceed landfill capacity or be out of compliance with federal, state, and local statutes and regulations related to solid waste during operations. (*Less than Significant*)

MPWSP Desalination Plant

Operation of the MPWSP Desalination Plant would produce approximately 20,000 pounds of residual solid waste per day through the desalination process. This waste would be dewatered onsite, resulting in approximately 5 cubic yards per day (or 7.5 tons) of solids requiring disposal at the Monterey Peninsula Landfill. The solids would contain naturally occurring organic and inorganic matter from the raw seawater, iron precipitated from coagulation during the pretreatment process, and low concentrations of other chemicals used in the treatment process. The solids would be tested prior to landfill disposal to ensure they meet nonhazardous waste disposal criteria. There are no known opportunities for reusing or recycling these solids, so diverting them from landfill disposal is not an option. Because the landfill operates 6 days per week, the 52.5 tons of resulting cake generated per week by the desalination process would result in a daily disposal rate of approximately 8.75 tons (i.e., assuming disposal 6 days per week). The administrative activities at the plant would generate nominal amounts of typical office wastes.

The Monterey Peninsula Landfill is permitted to accept up to 3,500 tons per day but, on average, receives less than 1,000 tons per day (CalRecycle, 2016; MRWMD, 2016); therefore, the landfill could accept the 8.75 tons of waste generated by the MPWSP Desalination Plant without exceeding its permitted daily tonnage or depleting substantial long-term capacity. As a result, operation of the proposed MPWSP Desalination Plant would have a less-than-significant impact related to landfill capacity and solid waste disposal.

ASR Pump-to-Waste System

Maintenance of the ASR Pump-to-Waste System is expected to generate approximately 240 pounds (less than 1 ton) per year of sediment that enters the wells when the water is injected, or from the surrounding soil. This material would be taken to the Monterey Regional Waste Management District's materials recovery facility for recycling and reuse. Therefore, no impacts related to landfill capacity and solid waste disposal are expected from operation of the proposed ASR Pump-to-Waste System.

All Other Proposed Facilities

All other proposed project components (subsurface slant wells, conveyance pipelines, storage facilities, pump station, the interconnections with Highway 68 satellite systems and other ASR-related facilities) would have limited potential to generate waste during facility operations and maintenance, and any waste generated at these facilities would be nominal. Impacts associated with disposal of solid waste produced at these facilities would be less than significant.

Impact Conclusion

MPWSP Desalination Plant operations would generate solid waste that would be routinely disposed of at the Monterey Peninsula Landfill. There are no known opportunities for reusing or recycling these solids, but the landfill could accept the waste without exceeding its permitted daily tonnage or substantially depleting long-term capacity. Maintenance of the ASR Pump-to-Waste System would generate sediment materials that would be taken to the Waste Management District's materials recovery facility for reuse or recycling. All other proposed facilities would have a very limited potential to generate waste during operations or maintenance. Impacts related to solid waste disposal and landfill capacity during operations and maintenance would be less than significant.

Mitigation Measures

None proposed.

Impact 4.13-4: Exceed wastewater treatment requirements of the Central Coast RWQCB, or result in a determination by the wastewater treatment provider that it has inadequate treatment or outfall capacity to serve the project. *(Less than Significant with Mitigation)*

Exceed Wastewater Treatment Requirements

As discussed in Chapter 3, Description of the Proposed Project, brine generated during the desalination process at the MPWSP Desalination Plant would be discharged to Monterey Bay through the MRWPCA's existing ocean outfall and diffuser. During certain times of the year, particularly during the non-irrigation (wet) season, the brine stream would be blended with treated wastewater effluent from the MRWPCA Regional Wastewater Treatment Plant prior to discharge. The availability of wastewater effluent for blending with the brine is limited during the dry season (irrigation season) and the brine could be discharged without dilution for extended periods (see **Table 4.13-4**). The *Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant* [Order No. R3-2014-0013, NPDES Permit No. CA0048551], which regulate discharges from the outfall, would be amended before the MPWSP Desalination Plant starts operating to incorporate the "brine only" and combined discharges. As described in Impacts 4.3-4 and 4.3-5 in Section 4.3, Surface Water Hydrology and Water Quality, both the "brine only" discharges and the combined discharges would comply with Ocean Plan water quality objectives for all assessed constituents. With implementation of the MPWSP, certain constituent concentrations, as discussed in Section 4.3.5.2 Operational and Facility Siting Impacts and **Appendix D3** (Trussell, 2016), could become elevated under several assessed discharge scenarios to a level that is close to the Ocean Plan standard. Additionally, due to gaps in the available water quality data, a compliance determination could not be made for ten individual constituents and consequently, it must be conservatively assumed that an exceedance of Ocean Plan water quality objectives could occur as a result of operational discharges.

**TABLE 4.13-4
BRINE STREAM AND TREATED WASTEWATER EFFLUENT FLOWS
THROUGH THE MRWPCA OUTFALL AND DIFFUSER**

	Average Monthly Flows (mgd)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Brine Stream from MPWSP Desalination Plant	13.98	13.98	13.98	13.98	13.98	13.98	13.98	13.98	13.98	13.98	13.98	13.98
Treated Wastewater Effluent from MRWPCA[a]	19.78	18.41	14.68	7.02	2.40	1.89	0.90	1.03	2.79	9.89	17.98	19.27
Combined Discharge	33.76	32.39	28.66	21.00	16.38	15.87	14.88	15.01	16.77	23.87	31.96	33.25

NOTES:
[a] Based on average monthly effluent discharges for the years 1998 through 2012.

SOURCES: RBF Consulting, 2013; MRWPCA, 2013.

Mitigation Measures 4.3-4 (Operational Discharge Monitoring, Analysis, Reporting, and Compliance) and Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives) are prescribed to monitor, report and reduce the water quality impact associated with potential exceedances of the Ocean Plan water quality objective to a less-than-significant level. Mitigation Measure 4.3-4 requires CalAm to implement a comprehensive Monitoring and Mitigation Plan consistent with the requirements of the Ocean Plan (described in detail in Section 4.3.2.2) that would set forth appropriate response thresholds and corrective actions that would be required if the acquired data indicated deleterious effects on receiving water quality or marine biological resources from the proposed MPWSP operational discharges. Mitigation Measure 4.3-5 would require data gathering to determine baseline conditions and compliance with Ocean Plan water quality objectives and would involve employing design features and/or operational measures to achieve the required minimum dilution of the discharge at the edge of the ZID to ensure compliance with Ocean Plan water quality objectives.

Wastewater Treatment Plant and Outfall Capacity

The only wastewater generated during project operations that would require treatment at the MRWPCA Regional Wastewater Treatment Plant is wastewater from bathrooms at the MPWSP Desalination Plant. Given the small number of CalAm employees that would be staffed at the MPWSP Desalination Plant (25 to 30 employees) the volume of wastewater generated at this facility would be approximately 750 gallons per day, which would have a negligible impact on the MRWPCA treatment capacity of 29.6 mgd and discharge capacity of 81.2 mgd. None of the treatment processes at the MPWSP Desalination Plant site and none of the other proposed project facilities located elsewhere would generate wastewater during operations that would require treatment at the MRWPCA Regional Wastewater Treatment Plant. Therefore, project operations would not exceed wastewater treatment capacity.

The existing 2.1-mile-long, 60-inch-diameter MRWPCA outfall pipeline terminates at a 1,100-foot-long diffuser resting above the ocean floor at approximately 90 to 110 feet below sea level. The diffuser is equipped with 172 ports (129 ports are currently open and 43 are closed), each 2 inches in diameter and spaced 8 feet apart. Depending on the number of closed ports, the outfall and diffuser have a physical discharge capacity of between 66.5 and 94.6 mgd (Trussell Technologies, 2012). The outfall and diffuser are permitted to discharge up to 81.2 mgd in accordance with the *Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant* (Order No. R3-2014-0013, NPDES Permit No. CA0048551) (RWQCB, 2014).

MRWPCA currently utilizes the existing ocean outfall and diffuser to discharge secondary treated wastewater effluent from the MRWPCA Regional Wastewater Treatment Plant to Monterey Bay. **Table 4.13-4** shows existing average monthly wastewater flows through the MRWPCA outfall and diffuser based on average monthly effluent discharges for the years 1998 through 2012. As shown, the volume of treated wastewater effluent varies throughout the year, with the highest flows occurring during the non-irrigation season (November through March). The lowest flows occur during the irrigation season (April through October) when a large portion of the secondary wastewater effluent from the MRWPCA Regional Wastewater Treatment Plant is diverted to the Salinas Valley Reclamation Project's tertiary treatment facility for additional advanced treatment and subsequently used for crop irrigation as part of the CSIP.

The MPWSP Desalination Plant would generate approximately 13.98 mgd of brine (including 0.4 mgd of decanted backwash effluent) that would be discharged through the MRWPCA's existing ocean outfall and diffuser. The amount of treated wastewater effluent available for blending with the brine stream would be variable throughout the year, and the brine stream could be discharged with minimal dilution for extended periods. As shown in **Table 4.13-4**, based on average monthly flows, both the "brine only" flows and the combined discharges would remain below the MRWPCA's permitted discharge capacity of 81.2 mgd throughout the year. An outfall capacity evaluation conducted in 2012 (Trussell Technologies, 2012) indicates that even under the worst- case conditions when additional ports are closed and outfall capacity is reduced to 41.1 mgd, the outfall has sufficient capacity to accommodate the additional brine stream.

Maximum instantaneous flows measured in the outfall between 1998 and 2012 (MRWPCA, 2013) ranged from 40.4 mgd to 59.9 mgd. This data indicates that even during peak storm events there would be sufficient capacity in the outfall to accept the brine generated by the MPWSP Desalination Plant year-round, assuming the existing outfall capacity of 81.2 mgd. However, as discussed in Section 3.2.2.5, Brine Storage and Disposal of Chapter 3, Description of Proposed Project, the brine stream, when combined with instantaneous peak flows of wastewater effluent from the MRWPCA Regional Wastewater Treatment Plant, could exceed the capacity of the outfall and diffuser during large storm events. Based on previous studies prepared by Trussell Technologies that assumed up to 23.7 mgd of brine would be discharged through the outfall (compared to approximately 14 mgd under the MPWSP) and outfall capacity is reduced to 41.4 mgd, 6 hours of storage capacity would provide more than adequate storage during periods of peak effluent flow (Trussell Technologies, 2012). The 3-million-gallon brine storage basin described in Section 3.2.2.5 has sufficient capacity to detain flows from approximately 6 hours of desalination plant operations. Thus, the impact related to outfall capacity would be less than significant.

Impact Conclusion

As described in Impacts 4.3-4 and 4.3-5 in Section 4.3, Surface Water Hydrology and Water Quality, both the "brine only" discharges and the combined discharges would comply with Ocean Plan water quality objectives for all assessed constituents. However, certain constituents would become elevated under several assessed discharge scenarios. **Mitigation Measures 4.3-4** and **4.3-5** would reduce the water quality impact associated with potential exceedances of the Ocean Plan water quality objectives to a less-than-significant level by requiring CalAm to conduct water quality assessments prior to MPWSP operation and to implement a comprehensive Monitoring and Reporting Plan that is consistent with the Ocean Plan requirements.

None of the treatment processes at the MPWSP Desalination Plant site and none of the other proposed project facilities would generate wastewater during operations that would require treatment at the MRWPCA Regional Wastewater Treatment Plant. Even during peak storm events, there would be sufficient capacity in the outfall to accept the brine generated by the MPWSP Desalination Plant year-round. The operations of the proposed project would not result in inadequate capacity at the existing wastewater treatment plant or the existing outfall and the impact would be less than significant.

Mitigation Measures

Mitigation Measures 4.3-4 and 4.3-5 apply to MPWSP Desalination Plant operations.

Mitigation Measure 4.3-4: Operational Discharge Monitoring, Analysis, Reporting, and Compliance.

Mitigation Measure 4.3-5: Implement Protocols to Avoid Exceeding Water Quality Objectives.

(See Section 4.3, Surface Water Hydrology and Water Quality, for the description.)

Impact 4.13-5: Increased corrosion of the MRWPCA outfall as a result of brine discharge associated with project operations. (*Less than Significant with Mitigation*)

As discussed above under Impact 4.13-4, the MRWPCA utilizes the existing ocean outfall and diffuser to discharge secondary treated wastewater effluent into Monterey Bay from the MRWPCA Regional Wastewater Treatment Plant. The existing 60-inch-diameter MRWPCA outfall pipeline includes a 13,000-foot-long unlined segment on land (starting at the regional wastewater treatment plant at about elevation +100), and a 9,880-foot-long unlined segment offshore. An unlined reinforced concrete beach junction box connects the land segment and the offshore segment of the outfall and is marked as Station 0+00 (E2 Consulting Engineering, 2015).

With implementation of the MPWSP, the brine produced during the reverse osmosis process at the MPWSP Desalination Plant would be conveyed to a brine mixing facility at the upstream end of the land segment of the outfall, which is located at the MRWPCA Regional Wastewater Treatment Plant. The brine would flow through the land segment, through the beach junction box, and through the offshore segment prior to discharging into Monterey Bay at the diffuser. An evaluation of the potential for increased corrosion of the offshore segment of the outfall due to the addition of brine discharge was completed by E2 Consulting Engineers (2015). Brown and Caldwell provided further analysis of the condition of the nearshore ocean outfall (Brown and Caldwell, 2017a). In addition, Brown and Caldwell and JDH Corrosion Consultants, Inc. conducted an evaluation of the 13,000-foot-long land segment of the MRWPCA outfall in November 2016. The results of these analyses are summarized below.

MRWPCA Ocean Outfall – Offshore Segment

The MPWSP Desalination Plant would generate approximately 14 mgd of brine (including 0.4 mgd of decanted waste effluent) that would be discharged through the MRWPCA's existing ocean outfall and diffuser. The salinity of the brine stream is estimated to range between approximately 57 and 58 parts per thousand (ppt), compared to the salinity of seawater in Monterey Bay, which ranges from 33.1 to 34.2 ppt (see Section 4.3, Surface Water Hydrology and Water Quality, for additional discussion regarding water quality impacts). The "brine only" discharges and combined discharges of brine and wastewater effluent would expose submerged metals and concrete in the outfall and diffuser to high salinity water.

The E2 assessment of the existing condition of the offshore segment of the outfall included field exploration, sampling, and laboratory testing of the samples. The laboratory results found the concrete strength to be excellent (over 7,500 pounds per square inch [psi] compared to designed compressive strength of 4,000 psi). The assessment concluded that, although chloride levels in the concrete samples were nine times the threshold for corrosion, the anaerobic environment present in the continuously exposed offshore segment of the outfall is the reason corrosion is not evident (i.e., there is no oxygen available for oxidation) (E2 Consulting Engineers, 2015).

The E2 assessment concluded that the existing offshore segment of the outfall pipeline could accept the brine stream from the MPWSP Desalination Plant without serious deterioration and that the reinforcing steel in the pipe would continue to be protected from corrosion by the anaerobic environment of its immersion, which precludes the introduction of oxygen into the steel/concrete interface. Even with the increased chloride concentrations from the brine, the corrosion of the offshore segment of the outfall would continue to be controlled by the availability, or lack, of oxygen. The offshore segment of the outfall pipe could be expected to live up to its original intended life expectancy provided oxygen is not introduced into the discharges and anaerobic conditions remain.

However, the E2 assessment found that some turbulence might be expected to occur in the existing beach junction box at the shoreline and the approximately first 100 feet of the offshore segment of the outfall pipeline when brine is introduced. This turbulence could introduce oxygen into the outfall and increase the potential for corrosion, which would be a significant impact of the project. The assessment recommended that the 100-foot-long segment of outfall pipe immediately downstream of the beach junction box be lined to ensure any oxygen introduced by turbulence does not cause corrosion of the concrete pipe (E2 Consulting Engineering, 2015; see Mitigation Measure 4.13-5a, below).

Due to storm events in the winter of 2015/16, the beach junction box and a portion of the existing outfall became exposed on the beach in front of CEMEX. Under an emergency Coastal Development Permit from the California Coastal Commission, MRWPCA was allowed to make temporary repairs, but is required to relocate the exposed components. As a project separate and independent from the MPWSP (but included in the cumulative scenario relevant to the MPWSP; see Table 4.1-2), MRWPCA would apply for a separate Coastal Development Permit and would relocate a pre-lined beach junction box inland by 650 to 1,000 feet, and install 650 to 1,000 feet of new 60-inch diameter pre-lined outfall pipe on the downstream side of the junction box, which would connect to the existing ocean outfall. That independent project would be completed prior to accepting MPWSP brine discharge into the outfall and would protect the beach junction structure and the portion of the offshore segment of the outfall that was of concern for increased corrosion from brine.

Although the E2 assessment concluded that the reinforcing steel in the outfall would be protected from corrosion by the anaerobic environment, Brown and Caldwell (January 9, 2017a) determined that the stainless steel clamps that were installed inside the outfall in 1990/1991 as a protective measure following the 1989 Loma Prieta earthquake, could be susceptible to chloride corrosion, which would be a significant impact. The *Beach Structure Evaluation and Protective Measures Technical Memorandum* (Brown and Caldwell, 2017a) recommends replacing all of the WEKO® seal clamps (approximately 20) in the nearshore area of the ocean outfall prior to relocation of the beach junction box, so that the existing beach junction box can be used by divers to access the outfall. Therefore, with implementation of **Mitigation Measure 4.13-5a (Replacement of WEKO Seal Clamps, Periodic Inspections, and As-Needed Repairs for Offshore Segment of MRWPCA Ocean Outfall)**, which requires the removal of the existing WEKO seal clamps, installation of new corrosion-resistant clamps within the nearshore portion of the ocean outfall prior to relocation of the beach junction structure, and periodic inspections of the outfall thereafter, the impact on the outfall resulting from the implementation of the MPWSP would be reduced to a less-than-significant level.

MRWPCA Ocean Outfall – Land Segment

Brown and Caldwell and JDH Corrosion Consultants, Inc. (JDH) conducted an evaluation of the 13,000-foot-long land segment of the MRWPCA outfall in November 2016. Inspections occurred at the MRWPCA Regional Wastewater Treatment Plant effluent junction structure and at the access manhole adjacent to Del Monte Boulevard. JDH personnel inspected approximately 250 feet of the outfall pipe downstream of the effluent junction structure and 250 feet upstream and downstream of the Del Monte Boulevard access point. JDH documented visual observations and collected concrete samples at four locations within the inspection area. In general, the reinforced concrete outfall pipe was found to be in good condition and inspectors saw no visible signs of corrosion. Similarly, the sample results indicated that the pipe was in good condition. Brown and Caldwell's *Land Outfall Pipeline Evaluation and Protective Measures Technical Memorandum* (2017b) concluded, however, that brine effluent would likely cause the outfall to deteriorate, and this would be considered a significant impact. However, with implementation of **Mitigation Measure 4.13-5b (Install Protective Lining in Land Segment of MRWPCA Ocean Outfall)**, which requires the phased installation of a protective liner system along the entire approximately 13,000-foot-long land segment of the outfall, the impact would be reduced to a less-than-significant level. Thereafter, periodic inspections of the land segment would be performed to ensure the continued integrity of the outfall pipe.

The 2017 Technical Memo (Brown and Caldwell, 2017b) recommended two types of liners: a Vylon slip liner and a spiral wound HDPE liner; each can be successfully installed over long distances. Both types of liners would involve the same installation methods and are therefore, discussed simultaneously in Mitigation Measure 4.13-5b.

Mitigation Measures

Mitigation Measure 4.13-5a applies to the MRWPCA outfall.

Mitigation Measure 4.13-5a: Replacement of WEKO seal clamps, Periodic Inspections, and As-Needed Repairs for Offshore Segment of MRWPCA Ocean Outfall.

Prior to operation of the MPWSP Desalination Plant, and as part of an agreement with MRWPCA to use the outfall for brine discharge, CalAm shall protect the offshore segment of the MRWPCA ocean outfall from corrosion, by replacing the existing WEKO seal clamps in the nearshore portion of the ocean outfall with new corrosion-resistant clamps.

Installation of the WEKO seal clamps shall occur prior to relocation of the existing beach junction box to allow for optimal access to the outfall. Construction shall occur in late summer/early fall, during the irrigation season, when flows in the outfall would typically be de minimis; this timing would also be late in the snowy plover nesting season when eggs would have hatched. To allow access to the offshore portion of the outfall through the existing beach junction box and to isolate any flow from the ocean outfall, a fabricated accessway shall be constructed within the existing beach junction box. Bypass pumping shall be set up with a surface pump and temporary discharge piping buried in sand, and any effluent shall be discharged into the tidal zone. To protect against any emergency high effluent flows resulting from process upsets of the treatment plant, an opening shall be provided in the fabricated accessway to allow for controlled releases.

Construction access shall follow along the existing outfall access road. The staging and work area shall be created on already disturbed ground at the western end of the access road and consist of no larger than a 50 square foot area for divers and diving equipment, a 20-foot container for equipment storage and a 5kw generator (in a sound enclosure) to be used if power is not available onsite. If the beach junction box and discharge pipeline are covered by sand, or if sand needs to be removed for staging, excavation would be accomplished using a backhoe or excavator. Up to one-half acre around the junction structure may be disturbed. Two working shifts per day may be required, and the installation would take approximately 6-8 weeks.

During construction, beach access shall remain open, with the potential exception of extreme high tide events. The contractor shall install temporary fencing around the construction site and construction shall be prohibited outside of the defined construction, staging, and storage areas. Construction work shall not be conducted seaward of the mean high water line unless tidal waters have receded from the authorized work areas. Construction vehicles operating on the beach shall be rubber-tired, and while in operation shall remain as high on the upper beach as possible to avoid contact with ocean waters and intertidal areas. Any construction materials and equipment placed on the beach during daylight hours shall be stored beyond the reach of tidal waters. All construction materials and equipment shall be removed in their entirety from the beach area by sunset each day that work occurs, with the exception of the storage of larger materials beyond the reach of tidal waters for which moving each day would be extremely difficult. Any larger materials intended to be left on the beach overnight must be approved by the Coastal Development Permit issuing agency and shall be subject to a contingency plan for moving materials in the event of a tidal wave/surge. All accessways impacted by construction activities shall be restored to their pre-construction condition or better within 3 days of completion of construction. Any beach sand in the area that is impacted by construction shall be filtered as necessary to remove construction debris. Construction areas shall maintain good construction site housekeeping controls and procedures (leak/spill clean-up; cover equipment in rain; cover exposed piles of soil/waste; dispose of waste properly; remove construction debris from beach). All construction activities that result in discharge of materials, polluted runoff, or wastes to the beach or the adjacent marine environment are prohibited. All exposed slopes and soil surface in and/or adjacent to the construction area shall be stabilized with erosion control best management practices.

CalAm shall enter into an agreement with MRWPCA to perform periodic inspections of the offshore portion of the MRWPCA outfall and diffuser. Annual inspections shall occur for the first three years after the MPWSP Desalination Plant is brought online. Thereafter, the offshore portion of the outfall shall be inspected every five years. During each inspection, photo documentation shall be provided for all areas of inspections, regardless of findings, to provide for photographic comparison over time. All inspections shall include documentation of the thickness of scaling, any exposure or corrosion of reinforcing steel, significant cracking or spalling of concrete, and any pitting of metals. Any necessary repairs to the outfall and/or diffuser shall be identified and performed.

Mitigation Measure 4.13-5b applies to the MRWPCA outfall.

Mitigation Measure 4.13-5b: Install Protective Lining in Land Segment of MRWPCA Ocean Outfall.

Prior to operation of the MPWSP Desalination Plant, and as part of an agreement with MRWPCA to use the outfall for brine discharge, CalAm shall line the land segment of the outfall with a protective liner system.

Installation of the liner shall occur only during the irrigation season (April through September), when flows in the outfall would be minimal. Installation of the liner in any given portion of the land segment is not expected to exceed 7 to 10 days. MRWPCA has identified 10 locations within the MRWPCA right-of-way (see **Figure 4.13-1**) from which CalAm or its contractor can access the land segment for installation of the liner; only these locations shall be used. Contractors shall install temporary fencing to denote the access limits for construction crews. The excavation pit at each access point shall be located directly above the outfall pipe and shall not exceed a size of 12 feet by 25 feet. Soils shall be stockpiled within the existing outfall right-of-way, and topsoil shall be stored in a separate pile for use in restoration following installation. Erosion and dust control measures shall comply with the applicable Stormwater Pollution Prevention Plan (SWPPP). After liner installation, the contractor shall restore soil in the pits to nearly pre-construction compaction levels and shall replace stockpiled topsoil to match pre-construction elevations.

To address the small amount of effluent flowing through the portion of the land segment to be lined between April and September, the contractor shall plug and dewater the outfall segment being lined, if needed, and use a 24-inch diameter bypass pipe to divert flows around the affected portion of the outfall.

SOURCE: MRWPCA, 2017

Figure 4.13-1
Proposed Access Pit Locations

4.13.5.3 Secondary Impacts of Mitigation Measure 4.13-5a

Potential secondary impacts associated with the implementation of **Mitigation Measure 4.13-5a (Replacement of WEKO seal clamps, Periodic Inspections, and As-Needed Repairs for Offshore Segment of MRWPCA Ocean Outfall)** are discussed below and would be associated with temporary impacts on aesthetic resources on the beach, conformity with land use plans and policies, limitations to beach access during high tide due to temporary fencing at the construction locations, greenhouse gas emissions and air quality impacts from the potential use of a 5 kW generator, and potential effects on biological resources from beach disturbance. Impacts would be similar to impacts identified for the proposed project construction and would be mitigated by the same measures identified for the project throughout Chapter 4.

Surface Water Quality

As discussed in Impact 4.3-1 in Section 4.3, Surface Water Hydrology and Water Quality, all project components would be subject to the NPDES Construction General Permit requirements and, pursuant to these requirements, a SWPPP would be prepared to include specific measures and conditions to reduce or eliminate stormwater flow carrying any pollutants or sediment from construction activities. The SWPPP would apply to work performed under this mitigation measure and its implementation would ensure that surface water quality impacts would be less than significant.

Aesthetic Resources

The construction area would be located in the Beaches and Coastal Dunes landscape unit near the CEMEX sand mining facility. As described in Section 4.14.2.3, Visual Setting of the Project Area, the site proposed for the staging area has a high aesthetic resource value. Activities associated with WEKO seal clamp replacement could result in temporary impacts on scenic resources and the visual character of the project area and vicinity. Activities, equipment, and staging areas would be temporarily visible from multiple public vantage points for approximately 6 to 8 weeks. Due to the site's topography and vegetation, views of the work areas from the east would be limited and the worksite would be largely screened from view by the intervening dunes and Monterey Cypress trees along the site's eastern perimeter. The work areas would be visible to people walking along the beach and from Monterey Bay. WEKO seal clamp replacement activities would contrast with the site's existing setting, and would appear dominant relative to the site's features and existing facilities and operations. While installation activities would temporarily detract from the naturalistic aesthetic of the coastal dunes as viewed by passersby, these activities would not impair permanent public views of the coast. For these reasons, project construction activities would have a moderate visual impact severity, and the impact would be temporary and less than significant.

Land Use, Lands Use Planning and Recreation

The WEKO seal clamp replacement activities would occur in an area identified in the *City of Marina General Plan* as Habitat Reserve and Other Open Spaces and zoned for Coastal Conservation and Development (CD) uses. The *City of Marina Local Coastal Program* and zoning regulations provide for conditional approval of coastal-dependent industrial land uses with a Use Permit and/or Coastal Development Permit (CDP). According to Marina Local Coastal Program Section 17.43.070.D, repair or maintenance of an outfall is subject to the requirements in a Coastal Development Permit. Since replacement of the WEKO seal clamps would maintain the resiliency of the MRWPCA outfall, CalAm will need to include the WEKO seal clamp replacement and associated activities in a CDP application. Based upon the permitted uses of the area, the City of Marina should be able to make findings in support of CDP issuance to include the replacement of the WEKO seal clamps, and with the requisite CDP, the WEKO seal replacement activities would not conflict with land use plan and zoning designations.

There is no vertical public access in the vicinity of the WEKO seal clamp replacement site, and the nearest vertical coastal accessways are located 1 mile south at Marina Dunes Preserve and 1.25 miles north at the Salinas River National Wildlife Refuge. While the beach seaward of the CEMEX site is used by the public, use levels at the site are low. Temporary fencing used to contain the project work area could impede lateral access along the beach during extreme high tides throughout the 6- to 8-week installation timeframe, a potentially significant impact. However, the impacts would be temporary and affected areas would thereafter be returned to their approximate pre-construction condition. Implementation of the following elements of Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan) would reduce impacts to a less-than-significant level:

- At least two weeks prior to construction, post signage along all potentially affected recreational trails and coastal access points to warn users of construction activities. The signs shall include information regarding the nature of construction activities, duration, and detour routes. Signage shall be composed of or encased in weatherproof material and posted in conspicuous locations, including on park message boards, and existing wayfinding signage and kiosks, for the duration of the closure period. At the end of the closure period, CalAm or its contractors shall retrieve all notice materials.

- CalAm and its contractors shall schedule construction activities to minimize impacts during heavy recreational use periods (e.g. weekends and holidays).
- All equipment and materials shall be stored in the designated contractor staging areas.

Air Quality and Greenhouse Gas Emissions

Combined with short-term emissions of the proposed project as a whole, construction could contribute to an exceedance of a state and/or federal standard for ozone, NO_2, and PM_{10} standards, which would be a significant impact. Mitigation Measures 4.10-1a, 1b, and 1c would reduce PM_{10} to a less than significant level. Construction activities associated with installation of the WEKO seal clamps would contribute to the overall impact of the proposed project, which would be less than significant with mitigation. Likewise, construction would contribute to the total greenhouse gas emissions of the proposed project, which exceeds the significance threshold, a significant impact. Mitigation Measure 4.11-1, GHG Emissions Reduction Plan, would reduce impacts to a less-than-significant level.

Terrestrial Biology

WEKO seal clamp replacement activities and the construction area described above could disturb up to 0.5 acre between the dunes and the beach. The area exhibits a similar terrestrial biological setting as the subsurface slant wells, described in Section 4.6.1.10, and in Table 4.6-2. Installation activities would be completed in late summer/early fall, which is late in the snowy plover nesting season (eggs would have hatched) to minimize any impact, but before the high wastewater flows in the late fall/early winter to minimize by-pass pumping requirements. However, construction activities would have the potential to significantly impact terrestrial biological resources in the vicinity of the project site. Therefore, implementation of the following mitigation measures identified in Section 4.6 would reduce impacts to a less-than-significant level:

- 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures;
- 4.6-1b: Construction Worker Environmental Awareness Training and Education Program;
- 4.6-1c: General Avoidance and Minimization Measures;
- 4.6-1d: Protective Measures for Western Snowy Plover;
- 4.6-1e: Avoidance and Minimization Measures for Special-status Plants;
- 4.6-1f: Avoidance and Minimization Measures for Smith’s Blue Butterfly;
- 4.6-1g: Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard;
- 4.6-1i: Avoidance and Minimization Measures for Nesting Birds;

- 4.6-1n: Habitat Mitigation and Monitoring Plan;
- 4.6-1p: Control Measures for Spread of Invasive Plants;
- 4.6-2a: Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas;
- 4.6-2b: Avoid, Minimize, and Compensate for Direct Construction Impacts to Sensitive Communities;
- 4.12-1b: General Noise Controls for Construction Equipment;
- 4.14-2: Site-Specific Nighttime Lighting Measures

In addition, activities associated with installation of the WEKO seal clamps could temporarily impact areas that may qualify as Primary and Secondary Habitat under the City of Marina Local Coastal Land Use Plan. Impacts on these communities would be mitigated to a less-than-significant level through implementation of the above mitigation measures.

4.13.5.4 Secondary Impacts of Mitigation Measure 4.13-5b

Potential secondary impacts associated with the implementation of **Mitigation Measure 4.13-5b (Install Protective Lining in Land Segment of MRWPCA Ocean Outfall)** are discussed below. Secondary impacts from staging of equipment, the excavation of access pits, the installation of the liner and effluent bypass pipelines, and site closure and clean-up, could result in possible disturbances to roadways, recreational trails, farmland, ranchland, and terrestrial biological resources. Potential effects on air quality and greenhouse gas emissions could also result. Impacts would be similar to impacts identified for the proposed project construction and would be mitigated by the same measures identified for the project throughout Chapter 4.

Traffic and Transportation

For installation of the temporary bypass pipe, utility crews would cut a 3-foot-wide trench across or adjacent to MRWPCA access roads, across Del Monte Boulevard, and across Lapis Road, to extend the bypass pipe between access pits. Traffic flow would be maintained on MRWPCA roads and Del Monte Boulevard through means of flaggers controlling alternate one-way traffic flow on the available one-lane width (implemented as part of Mitigation Measure 4.9-1, Traffic Control and Safety Assurance Plan). Two-way traffic flow would be restored after installation is complete through the use of steel traffic plates. Once work that is dependent upon this bypass pipe is complete, the trench would be reopened, with traffic flow again being maintained using the above-described alternate one-way traffic flow system until the trench is filled and the roadway resurfaced.

Lapis Road would be temporarily closed (one to two days) just north of the CEMEX access road, and traffic would be detoured to Del Monte Boulevard via the southern intersection of Lapis Road / Del Monte Boulevard (implemented as part of Mitigation Measure 4.9-1, Traffic Control and Safety Assurance Plan) while crews cut a trench, install the pipe, and cover with steel plates; two-way traffic flow would be restored. When work dependent upon the bypass pipe is complete, Lapis Road would again be temporarily closed and detoured in the same fashion as described above while the trench is reopened and filled and the roadway resurfaced. This impact on traffic flow would be reduced to less than significant with the implementation of Mitigation Measure 4.9-1.

For outfall access points adjacent to the CEMEX access road, utility crews would excavate up to a 12-foot by 25-foot access pit(s). Soil would be stockpiled adjacent to the pit(s). No work would occur in the road, but construction equipment, materials, and trucks would use the CEMEX access road. Access for mining operations would continue and impacts would be less than significant. As discussed in Section 4.9, Traffic and Transportation, Mitigation Measures 4.9-1 (Traffic Control and Safety Assurance Plan) and 4.9-6 (Roadway Rehabilitation Program) would apply to all proposed project facilities and associated construction activities, and applicable measures would be implemented to ensure continued access.

For installation of the temporary bypass pipe, utility crews would cut a 3-foot-wide trench across the Monterey Peninsula Recreational Trail and backfill to original condition once the pipe has been installed. Once work is complete, the trench would be reopened, the pipe would be removed, and the surface would be returned to original condition. Construction would be of short duration (one to two days) and temporary access would be provided around the work area and the impact would be less than significant. Although this impact would be less than significant, implementation of Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan) would assist with recreational use during construction, further reducing any potential impact.

Farmland

For installation of the temporary bypass pipe, utility crews would cut a 3-foot-wide trench through the field that is currently cultivated in strawberries.

Outfall access would involve excavation of up to three 12-foot by 25-foot access pits within active farmland, and soil would be stockpiled within a larger footprint adjacent to the access pits within the MRWPCA right-of-way.

The work would be coordinated with the owners of the agricultural operations to take a portion of the field out of production, on a temporary, as-needed basis, and then restore the field to production upon construction completion. Lining would take no more than 7 to 10 days per segment and would occur during the irrigation season from April through September. Any impacts would be temporary and less than significant with implementation of Mitigation Measure 4.16-1, Minimize Disturbance to Farmland. Further, MRWPCA proposes to reimburse landowners for costs related to lost production (Brown and Caldwell, 2017b).

Terrestrial Biology

Utility crews would run the temporary bypass pipe across the ground surface of Armstrong Ranch; no trenching would be required. Up to one 12-foot by 25-foot access pit would be excavated, and soil would be stockpiled adjacent to the access pit within the MRWPCA right-of-way. Utility trucks would access Armstrong Ranch via unpaved roads that traverse the property. To install the bypass pipe, utility trucks would drive off-road along the scarred surface within the MRWPCA right-of-way on Armstrong Ranch. Impacts on special-status or sensitive species, such as California tiger salamander that may use adjacent grassland as upland habitat, would be reduced to less than significant with implementation of the biological resources mitigation measures listed below.

The excavation pits would be located in areas with similar types of biological resources as the Source Water Pipeline, described in Section 4.6, Terrestrial Biological Resources. To avoid impacts on special-status or sensitive species at or between these access locations and in the staging area, the work required under this mitigation measure would be subject to the following mitigation measures:

- 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures;
- 4.6-1b: Construction Worker Environmental Awareness Training and Education Program;
- 4.6-1c: General Avoidance and Minimization Measures;
- 4.6-1d: Protective Measures for Western Snowy Plover;
- 4.6-1e: Avoidance and Minimization Measures for Special-status Plants;
- 4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly;
- 4.6-1g: Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard;
- 4.6-1h: Avoidance and Minimization Measures for Western Burrowing Owl;
- 4.6-1i: Avoidance and Minimization Measures for Nesting Birds;
- 4.6-1j: Avoidance and Minimization Measures for American Badger;
- 4.6-1l: Avoidance and Minimization Measures for Special-status Bats;
- 4.6-1o: Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander;
- 4.6-1p: Control Measures for Spread of Invasive Plants; and if applicable,
- 4.6-1n: Habitat Mitigation and Monitoring Plan.

Implementation of these mitigation measures would ensure that site surveys would be completed by qualified biologists to identify any special-status or sensitive species, and if any special-status or sensitive species are identified, implementation of required avoidance and protection measures would ensure that impacts on special-status or sensitive species at the site are reduced to a less-than-significant level.

Air Quality and Greenhouse Gas Emissions

Construction equipment would include a backhoe, dump truck, flatbed truck, crane, and personal automobiles (pick-up trucks). Combined with short-term emissions of the proposed project as a whole, construction could contribute to an exceedance of a state and/or federal standard for ozone, NO_2, and PM_{10} standards, which would be a significant impact. Mitigation Measures 4.10-1a, 1b, and 1c would reduce PM_{10} to a less-than-significant level. Activities associated with installation of the outfall liner would contribute to the impact of the proposed project as a whole, less than significant with mitigation. Likewise, construction would contribute to the total greenhouse gas emissions of the proposed project, which exceeds the significance threshold, a significant impact. Mitigation Measure 4.11-1, GHG Emissions Reduction Plan, would reduce impacts to a less-than-significant level.

4.13.6 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects.

Impact 4.13-C: Cumulative impacts related to public services and utilities (*Less than Significant with Mitigation*)

As discussed in Section 4.13.5, the MPWSP would have no impact on public services. Accordingly, the MPWSP would not cause or contribute to cumulative impacts related to public services.

The geographic scope for cumulative utilities systems impacts consists of the service areas of utility providers for wastewater treatment, water treatment, stormwater drainage, water supply, and solid waste landfill needs, as defined in Section 4.13.1. For example, the geographic scope for landfill capacity and compliance with solid waste statutes and regulations considerations encompasses Monterey County. Cumulatively significant impacts on utility systems could result if the incremental effects of the MPWSP during the construction and/or operations phases combined with effects from one or more of the cumulative projects listed in **Table 4.1-2** that would result in a cumulatively considerable impact.

4.13.6.1 Cumulative Construction Impacts

Damage to or Disruption of Existing Utilities and Relocation of Utilities

A cumulatively significant impact on utilities could result if the incremental impacts of the MPWSP combined with those of one or more of the cumulative projects would cause utility damage, extended periods of utility service disruptions, or multiple disruptions within a short timeframe. As described in Impact 4.13-1, construction of the MPWSP could damage or interfere with existing water, sewer, stormwater drainage, natural gas, electric, or communication utility service lines. MPWSP construction activities could involve accidental damage, temporary disconnection, or planned relocation of utility lines, each of which could interrupt service.

As discussed in Impact 4.13-1, the MPWSP's potential utility impacts would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.13-1a (Confirm Utility Line Information)**, **4.13-1b (Coordinate Final Construction Plans with Affected Utilities)**, **4.13-1c (Safeguard Employees from Potential Accidents Related to Underground Utilities)**,

4.13-1d (Emergency Response Plan), **4.13-1e (Notify Local Fire Departments)**, and **4.13-1f (Ensure Prompt Reconnection of Utilities)**.

Cumulative projects that could cause utility impacts similar to those described for the MPWSP include those identified in **Table 4.1-2** involving future construction. Due to the localized nature of utilities, most potential impacts would likely be limited to construction areas or utility distribution subareas, rather than affecting the entire project area or utility service area. The incremental contribution of the residual (post-mitigation) effects of the MPWSP to a cumulative impact would not be substantial because most potential effects would be related to pipeline construction. Given the rate of pipeline installation (150 to 250 feet per day), MPWSP construction activities that have the potential to disrupt utility service would not occur in the vicinity of other cumulative projects for extended periods of time such that prolonged or frequent disruption of service would occur in the vicinity (or utility service subarea) of cumulative projects with potential to cause similar effects. Therefore, after implementation of mitigation measures described above, the MPWSP's residual effects would be minimal and would have a less than significant contribution to cumulative utility service impacts.

Landfill Capacity and Compliance with Solid Waste Statutes

A significant cumulative impact would occur if the incremental impacts of the MPWSP combined with those of one or more of the cumulative projects would generate waste volumes that exceed available landfill capacity, or if the handling of those materials would violate applicable solid waste statutes. As discussed in Impact 4.13-2, construction of the MPWSP would generate an estimated 25,110 cubic yards (or 37,665 tons) of excess spoils and construction debris. Conservatively assuming all MPWSP construction waste would be disposed at the Monterey Peninsula Landfill, the MPWSP would represent approximately 0.05 percent of the landfill's remaining capacity. Construction could be inconsistent with the Monterey County Integrated Waste Management Plan because the total volume of construction wastes and excess spoils could be landfilled if not recycled properly. Because the Integrated Waste Management Plan is intended to address countywide diversion goals, being inconsistent with this plan could result in a significant contribution to a potentially significant cumulative impact. Most of the cumulative projects listed in **Table 4.1-2** would also generate construction-related waste. Given the landfill's finite capacity and the potential for waste diversion, and conservatively assuming all cumulative projects would dispose of solid waste at the Monterey Peninsula Landfill, a cumulatively significant effect could occur if cumulative projects generating solid waste did not adhere to State requirements for diversion of solid waste from landfills (see Section 4.13.2, Regulatory Framework, for additional details). However, such policies were put in place to address cumulative impacts; therefore, it is unlikely that the projects in **Table 4.1-2** would result in significant adverse cumulative impacts on landfill capacity during construction. As described above, the proposed project would be required to implement **Mitigation Measure 4.13-2 (Construction Waste Reduction and Recycling Plan)**. Implementation of this measure would ensure consistency with the plan, and the residual impact therefore would be less than significant.

4.13.6.2 Cumulative Impacts during Project Operations

Landfill Capacity and Compliance with Solid Waste Statutes

As discussed in Impact 4.13-3, operation of the MPWSP Desalination Plant would generate approximately 5 cubic yards (or 7.5 tons) of sludge or "cake" per day that would be disposed of at the Monterey Peninsula Landfill. As described in Section 4.13, this would result in an average daily disposal of 8.75 tons over the six days per week the landfill operates. This volume would represent approximately 0.35 percent of the facility's available daily receiving capacity of 2,500 tons (the difference between permitted capacity and current actual daily intake) and would continue throughout the project's lifetime. Over the assumed 40-year operating lifetime of the MPWSP, disposal of cake would represent 0.02 percent of the landfill's current remaining lifetime capacity. There are no known opportunities for reusing or recycling these solids, so diverting them from landfill disposal is not an option. As discussed previously, many of the cumulative projects identified in **Table 4.1-2** would also generate wastes. Given the relatively small effect of the MPWSP waste disposal on daily and absolute landfill receiving capacity, and the comparatively large contribution anticipated by cumulative projects, the MPWSP's contribution to a cumulatively significant landfill capacity impact would be less than significant.

Generate Wastewater Flows that would Exceed Wastewater Treatment Requirements or the Capacity of the Existing Ocean Outfall

A significant cumulative impact would occur if the effects of the MPWSP combined with those of the cumulative projects would cause effluent flows to exceed the MRWPCA outfall's capacity or exceed wastewater treatment requirements. One of the projects in **Table 4.1-2** that could have the potential to contribute to cumulative wastewater flows is the Regional Urban Water Augmentation Project (RUWAP) Desalination Element. The effects of the MPWSP brine stream combined with the RUWAP Desalination Element brine stream were considered in the evaluation of the proposed project since the RUWAP flows would be included in the range of flows from the MRWPCA. Implementation of **Mitigation Measures 4.3-4** and **4.3-5** would manage the water quality impact associated with potential exceedances of the Ocean Plan water quality objectives by requiring CalAm to conduct water quality assessments prior to MPWSP implementation and to implement a comprehensive Monitoring and Reporting Plan that is consistent with the Ocean Plan requirements, to ensure this cumulative impact would be less than significant, and the project's contribution is less than significant.

The MPWSP's brine stream would add approximately 14 mgd to the MRWPCA outfall's discharge. Projects identified in **Table 4.1-2** that would increase residential, commercial, office, or institutional development would generate new wastewater streams, many of which would be routed to the MRWPCA's Regional Wastewater Treatment Plant. Much of these flows would be recycled for irrigation purposes during the dry season, but could become part of the wastewater stream during the wet season. In addition, the RUWAP Desalination Element, if it was implemented, would increase brine flows through the MRWPCA outfall and diffuser. Under normal operating conditions, additional cumulative project wastewater effluent from the MRWPCA Regional Wastewater Treatment Plant, when combined with that of the MPWSP and

RUWAP brine streams, would not cause discharges to exceed the capacity of the existing ocean outfall except under extreme wet weather conditions (Trussell Technologies, 2012). The implementation of the RUWAP Recycled Water Element would deliver up to 1,400 afy of recycled water, and therefore, would reduce the volume of effluent that is discharged through the outfall and diffuser.

In addition, as discussed in Section 3.2.2.5, Brine Storage and Disposal of Chapter 3, Description of the Proposed Project, in the event that the brine stream combined with instantaneous peak flows of wastewater effluent from the MRWPCA Regional Wastewater Treatment Plant were to exceed the capacity of the outfall and diffuser during large storm events, CalAm would detain the MPWSP brine stream at the proposed brine storage basin until sufficient capacity is available in the outfall for discharge. The proposed 3-million-gallon brine storage basin has sufficient capacity to detain flows from approximately 6 hours of desalination plant operations, which represents the holding time necessary to avoid an exceedance during a worst-case scenario in which outfall capacity is reduced to approximately 41 mgd during instantaneous peak flows (Trussell Technologies, 2012). With detention, the MPWSP effluent would not substantially contribute to outfall capacity constraints. The effect of the MPWSP effluent on ocean outfall capacity impacts would be less than significant.

Increased Corrosion of the MRWPCA Outfall

A cumulatively significant impact would occur if the effects of the MPWSP combined with those of the cumulative projects would cause a substantial increase in corrosion of the MRWPCA outfall. As discussed in Impact 4.13-5, lack of oxygen at the offshore segment of the outfall would protect the outfall from increased corrosion and scaling due to anaerobic conditions. However, the land segment of the outfall, the existing junction box at the shoreline, and the first 100 feet of the offshore pipeline could experience aerobic conditions which would increase the potential for corrosion of these facilities, resulting in a significant impact. As discussed in Impact 4.13-5, it is assumed that the amount of treated wastewater effluent available for blending with (i.e., diluting) the brine stream would be highly variable throughout the year, and the brine stream could be discharged with little or no dilution for extended periods. **Mitigation Measure 4.13-5a (Replacement of WEKO seal clamps, Periodic Inspections, and As-Needed Repairs for Offshore Segment of MRWPCA Ocean Outfall)** requires the replacement of the existing WEKO seal clamps in the nearshore portion of the offshore outfall pipeline, periodic inspections of the outfall thereafter, and performance of any necessary corrosion-related repairs. Additionally, **Mitigation Measure 4.13-5b (Install Protective Lining in Land Segment of MRWPCA Ocean Outfall)** requires the application of a protective lining along the land segment.

Only two of the projects in **Table 4.1-2**, the RUWAP Recycled Water Element and the RUWAP Desalination Element, could potentially affect flows that utilize the outfall pipeline. The RUWAP Recycled Water Element could reduce the volume of wastewater discharged through the outfall during the summer months, while the RUWAP Desalination Element could increase the volume of brine effluent discharged through the outfall. Implementation of either project would result in an increase in the proportion of effluent that is composed of brine.

As noted previously, the analysis in Impact 4.13-5 assumes that the MPWSP brine stream could be discharged without dilution for extended periods since MRWPCA wastewater flows presently vary substantially across seasons. Therefore, MRWPCA wastewater flow reductions resulting from the RUWAP Recycled Water Element would not be expected to affect brine effluent-related corrosion or scaling of the MRWPCA outfall beyond that described for the MPWSP. The brine concentration in the RUWAP Desalination Element's effluent would be similar to that of the MPWSP; according to the RUWAP Draft EIR (2004) the brine from the proposed RUWAP desalination process would have an estimated total dissolved solids (TDS) level of 47,600 mg/L (or 47.6 ppt salinity) which is lower than the estimated salinity of the brine that would be generated by the proposed MPWSP (58.23 ppt, see Table 4.3-11). Although the total volume of brine would increase with the MPWSP and RUWAP Desalination Element, the combined salinity would not be expected to change substantially. Therefore, the combined salinity would be close to that described for the proposed project, and may still result in a significant cumulative impact. Implementation of Mitigation Measures 4.13-5a and 4.13-5b would substantially reduce the potential for MPWSP-related corrosion and scaling effects on the outfall. The residual potential for MPWSP operations to contribute to cumulative impacts on the MRWPCA outfall corrosion would be substantially reduced. Given that cumulative brine concentrations would not be substantially different from that of MPWSP operations alone, with mitigation, the proposed project's contribution to the cumulative impact involving corrosion of the MRWPCA outfall would be less than significant.

Cumulative Impacts of Secondary Impacts of Mitigation Measure 4.13-5a

A significant cumulative impact would occur if the effects of the MPWSP combined with those of the cumulative projects would cause substantial impacts on special-status species and habitat. Construction associated with the WEKO seal clamp installation would have the potential to cause significant adverse secondary impacts on terrestrial biological resources in the vicinity of the project site, including western snowy plover habitat, and other special status-plants and animals.

The Beach Junction Structure replacement project (No. 61) would begin directly after the WEKO seal clamps are installed, since the existing junction box would act as an accessway for divers to install the WEKO clamps, and would occur in the same area proposed for WEKO seal clamp installation activities. The Beach Junction Structure project would relocate the junction box inland by 650 to 1,000 feet and install 650 to 1,000 feet of new 60-inch diameter outfall pipe on the westward (ocean) side of the junction box, which would connect to the existing ocean outfall. This project has the potential to adversely impact special-status plants and animals and their habitats. It is expected that mitigation measures to reduce impacts on such resources would be included in the forthcoming EIR for that project; however, impacts may be significant and would contribute to cumulative effects.

As described above, mitigation measures for impacts on terrestrial biological resources would apply to the implementation of Mitigation Measure 4.13-5a. These mitigation measures would reduce impacts from installation of the WEKO seal clamps to a less-than-significant level, and residual impacts following implementation of mitigation would be negligible given the minor extent of disturbance associated with the WEKO seal clamp installation and the mitigation measures' focus on avoiding impacts. Thus, after mitigation, impacts from Mitigation Measure 4.13-5a would result in a less than significant contribution to potentially significant cumulative effects.

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4.14 Aesthetic Resources

This section addresses the potential aesthetic and visual quality impacts associated with implementation of the Monterey Peninsula Water Supply Project (MPWSP or proposed project). Aesthetic resources, also referred to as visual resources, are comprised of the visible natural and built landscape features that exist in the project vicinity. The study area for aesthetic resources includes designated scenic roadways, scenic vistas, and other scenic resources, as well as the daytime and nighttime lighting environment in the project area.

Comments received on the April 2015 Draft EIR related to aesthetic resources concern the proposed project's compatibility with Fort Ord Dunes State Park, physical descriptions of the subsurface slant wells and MPWSP Desalination Plant, and recommendations for improvement measures related to facility design, screening, and nighttime lighting where not otherwise required to address a significant impact. This section has been modified to address these comments. Specifically, MPWSP's relationship to Fort Ord Dunes State Park is addressed in Section 4.14.6.1. Physical descriptions of the subsurface slant wells and MPWSP Desalination Plant are addressed in Section 4.14.6.2, Operational and Facility Siting Impacts. Recommended mitigation measures for facility design, screening, and nighttime lighting are addressed in Sections 4.14.6.1 and 4.14.6.2.

4.14.1 Introduction, Key Concepts, and Terminology

This assessment of the proposed project's impacts on aesthetic resources describes environmental baseline conditions in terms of visual character, visual quality, visual sensitivity, and landscape exposure; presents an evaluation of the potentially affected aesthetic resources as viewed from various points throughout the project area; and determines whether construction and/or operation of the proposed project components could adversely affect the identified aesthetic resources. The subsections that follow describe key terms and concepts used throughout this section.

4.14.1.1 Visual Character

Visual character is the unique set of landscape features that combines to make a view. These features include native landforms, water, and vegetation patterns as well as built features such as buildings roads, and other structures.

4.14.1.2 Aesthetic Resource Value

A site's overall aesthetic resource value is determined by considering three factors: visual quality, visual sensitivity, and landscape exposure. These three factors are described below.

Visual Quality

The intrinsic aesthetic appeal, or visual quality, of a landscape or scene is a function of both its natural elements and anthropogenic (human-induced) modifications. Landscapes composed of elements with compatible lines, shapes, forms, colors, and contrasts tend to be of high visual quality. Landscapes with high levels of disturbance that promote disharmony, reduce variety, or introduce chaotic assemblages of shapes and forms into a landscape (visual clutter) are generally considered to be of low visual quality. Occasionally, anthropogenic modifications may add to the aesthetic appeal of a landscape. For example, vineyards often add pleasing patterns and colors to a landscape. The visual quality of a particular setting is typically rated as low, moderate, or high depending on the relationships of the above-described landscape elements.

Visual Sensitivity

Visual sensitivity refers to the level of interest or concern the public has for a particular visible landscape. Areas that attract people because of their aesthetic appeal (e.g., parks, trails, and scenic highways, where expectations for aesthetically pleasing views are high) have high visual sensitivity. In contrast, developed urban areas, industrial parks, and other areas with highly modified landforms are typically considered to be of low visual sensitivity. This evaluation rates visual sensitivity as low, moderate, or high.

Landscape Exposure

Landscape exposure is a measure of the length of time (duration) and the frequency with which a particular landscape is generally observed. A rural landscape may be seen frequently and/or for long durations, but only by a few local residents, whereas an uninhabited landscape crossed by a highway may be seen by numerous travelers, but only for brief periods. In both cases, the landscape would be considered to have a high degree of exposure. The number of viewers and the duration of view are equally important in determining landscape exposure.

Consideration of the factors described above—visual quality, visual sensitivity, and landscape exposure—yields a qualitative measure of the overall aesthetic resource value of a given area. **Table 4.14-1** provides a matrix for assigning the aesthetic resource value of a site by ranking these factors as low, moderate, or high. Each factor contributes equally in determining the overall aesthetic resource value of a given landscape. The aesthetic resource value is determined by cross-referencing the visual quality ranking (column headings on top of horizontal axis), the landscape exposure (column headings on bottom of horizontal axis), and the visual sensitivity (row headings on vertical axis). For example, a site with a visual quality rating of moderate (center three columns), landscape exposure of high (center right column), and visual sensitivity of high (bottom row) would have an aesthetic resource value of high.

TABLE 4.14-1
MATRIX FOR RANKING AESTHETIC RESOURCE VALUE

		Visual Quality								
		Low			***Moderate***			***High***		
Visual Sensitivity	***Low***	L	L	M	L	M	M	M	M	M
	Moderate	L	M	M	M	M	M	M	M	H
	High	M	M	M	M	M	H	M	H	H
		Low	***Moderate***	***High***	***Low***	***Moderate***	***High***	***Low***	***Moderate***	***High***
		Landscape Exposure								

NOTES:
L = Low M = Moderate H = High

4.14.1.3 Visual Impact Severity

Visual impact severity is a measure of how profoundly the existing visual setting would be disturbed by implementation of the proposed project. The level of impact is typically evaluated from a public vantage point and takes into consideration the proposed structures, architectural details, and landscaping. Visual impact severity is given a low, moderate, or high rating depending on an evaluation of the following three factors: visual contrast with the surrounding setting; the dominance of the proposed project relative to the surrounding features; and the potential for the proposed project to impair public views of valued aesthetic features such as trees, ridgelines, water, sky, or other distinctive landforms.

4.14.2 Setting/Affected Environment

4.14.2.1 Scenic Routes

Several roads in the Monterey region have been designated as scenic roadways by the California Department of Transportation (Caltrans) and/or the local jurisdictions, or are deemed eligible for such designation. Designated scenic roadways and eligible scenic roadways in the project area include Highway 1, Highway 68, Reservation Road, and Carmel Valley Road. In addition, the Monterey Peninsula Recreational Trail is considered to be an important scenic route due to its sweeping coastal views.

Highway 1. Highway 1 is an important regional travel corridor within the project area. This highway varies from a two-lane surface state highway (with at-grade intersections) to a multi-lane freeway. Between the Santa Cruz County line and Highway 68, Highway 1 is eligible for designation as a scenic highway; the portion of Highway 1 between Highway 68 and the San Luis Obispo County line is a designated scenic highway; between the Salinas River and Highway 68, Highway 1 is eligible for designation as a scenic highway. Traffic volumes along Highway 1 are generally high, with average daily traffic ranging from 42,000 to 47,000 vehicles between Highway 156 and the city of Marina; and from 50,000 to 83,000 vehicles between Marina and the city of Monterey's southern boundary (Caltrans, 2015).

Highway 68. Highway 68, also known as the Monterey-Salinas Highway, is a state highway connecting Monterey with Salinas. The segment of Highway 68 extending from Highway 1 in the city of Monterey to the Salinas River is a state-designated scenic highway; the segment of Highway 68 extending from the Salinas River to the city of Salinas is eligible for designation as a scenic highway. Between the Highway 1 interchange in Monterey and the Reservation Road interchange in Spreckles, average daily traffic volumes on Highway 68 range from 21,800 to 29,000 vehicles (Caltrans, 2015).

Highway 156. Highway 156 is a state highway that serves as an important link between the Monterey Peninsula and destinations in the San Francisco Bay Area and Central Valley. The approximately 4-mile segment extending from Highway 1 to Highway 101 is a state-designated scenic highway. In addition, the approximately 1.5-mile segment of Highway 156 extending north from its junction with Highway 1 (north of Molera Road) through Castroville to the TAMC railroad overcrossing (west of Castroville Boulevard) is a Monterey County-designated scenic highway. Between Highway 1 and Highway 101, average daily traffic volumes on Highway 156 range from 29,000 to 31,000 vehicles (Caltrans, 2015).

Reservation Road. Reservation Road traverses the project area through both Marina and Monterey County, providing two travel lanes in each direction. The segment of Reservation Road that passes through unincorporated Monterey County is a County-proposed scenic corridor. The *City of Marina General Plan* indicates that Reservation Road provides scenic views of the inland hills in Marina (City of Marina, 2000).

Carmel Valley Road. Carmel Valley Road is a county-proposed scenic route from Highway 1 to Arroyo Seco Road. The *Monterey County General Plan* identifies the Carmel Valley as a prominent feature along this route. In the vicinity of the proposed Carmel Valley Pump Station site, Carmel Valley Road is both a four- and two-lane road. The segment between Highway 1 and Del Mesa Drive includes travel lanes in each direction. East of Del Mesa Drive, Carmel Valley Road provides one travel lane in each direction (Monterey County, 2010a).

Monterey Peninsula Recreational Trail. The Monterey Peninsula Recreational Trail is an 18-mile paved scenic path that extends from Castroville to Pacific Grove. Views from the trail include agricultural fields, open space and park lands, and the sandy beaches and dunes along the Monterey Bay coast.

4.14.2.2 Landscape Units

The coastal landscape of northern Monterey County is agriculturally rich, visually diverse, and recognized for its aesthetic character. This evaluation characterizes the visual setting in Monterey County and provides a framework for evaluating the visual effects of the proposed project by describing the region in terms of "landscape units" based on the Federal Highway Administration's Method of Visual Resource Analysis (FHWA, 1987). The landscape units represent combinations of physical and cultural features that contribute to varying degrees of visual quality. For this analysis, landscape units are strictly aesthetic delineations based on factors such as land use, location, degree of urbanization, and boundaries of vegetation communities. The landscape units used in this evaluation to describe the regional landscape are: Urban and Built-up; Hillside

Residential; Agricultural; Beaches and Coastal Dunes; Grass and Rangeland; Riparian; Coastal Shrub; Oak Woodland; and Forested Hills. The distribution of the various landscape units in the project area and vicinity is shown in **Figure 4.14-1**; representative photographs of these landscape units are provided in **Figure 4.14-2**.

Urban and Built-up Landscape Unit

This landscape unit includes the cities of Monterey, Marina, Seaside, and Carmel Valley, as well as the surrounding unincorporated areas that are considerably built-up. This landscape unit is characterized by the predominance of anthropogenic features (i.e., urban development). Due to the high level of anthropogenic modifications, this landscape unit is generally considered to be of low visual quality. The proposed Brine Discharge Pipeline, Brine Mixing Box, the Pipeline to CSIP Pond, and the MPWSP Desalination Plant, as well as portions of the proposed Source Water Pipeline, the new Desalinated Water Pipeline, and the Castroville Pipeline would be constructed within or adjacent to the Urban and Built-up landscape unit north of Reservation Road. A portion of the Ryan Ranch–Bishop Interconnection Improvements, portions of the proposed new Transmission Main, ASR pipelines (ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline), ASR-5 Well and ASR-6 Well, and Carmel Valley Pump Station, would be constructed within or adjacent to the Urban and Built-up landscape unit south of Reservation Road. The Urban and Built-up areas in which the proposed facilities would be constructed range in visual quality from low (e.g., highly developed commercial/industrial corridors) to moderate (e.g., tree-lined neighborhood streets).

Hillside Residential Landscape Unit

This landscape unit consists of single-family residential housing on large lots in and around hillside areas. It is distinguished from the Urban and Built-up landscape unit by the substantially greater distance between dwellings. The hillsides are both wooded and open and often offer expansive views. The visual quality of this landscape unit is moderate to high because of its distinctive relief, semi-natural state, and open views of land, sky, and ocean. No project components would be constructed within the Hillside Residential landscape unit north of Reservation Road. A portion of the proposed Ryan Ranch–Bishop Interconnection Improvements as well as the Main System–Hidden Hills Interconnection Improvements would be located within or adjacent to the Hillside Residential landscape unit south of Reservation Road.

Agricultural Landscape Unit

North of Reservation Road, an Agricultural landscape unit extending along the Salinas River and north to the Salinas Valley is known for its rural and agricultural aesthetic. The quintessential rural landscape brings to mind vast agricultural fields, farmhouses, water towers, and small dusty towns. The visual quality of this landscape unit varies from moderate to high, depending on the degree to which cultural features (crops, utilities, industry, highways, etc.) either contribute to or detract from its original feel. Portions of the proposed Castroville Pipeline, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond would be constructed adjacent to the Agricultural landscape unit north of Reservation Road.

There is no Agricultural landscape unit in the vicinity of the MPWSP facilities located south of Reservation Road.

Beaches and Coastal Dunes Landscape Unit

The Beaches and Coastal Dunes landscape unit is one of the most distinctive in the project area and tends to attract people because of its aesthetic appeal. The coastal dunes are up to 100 feet tall and have moderate to steep slopes stabilized to varying degrees by scattered patches of dune scrub. The dunes and adjacent Monterey Bay (within MBNMS) display soft forms, curved lines, and distinctive natural color contrasts that are visually appealing. This landscape unit contains gently sloped, broad, white-sand beaches that extend along an increasingly curved arc from Moss Landing to Monterey. The majority of this unit lies west of Highway 1, extends south from the Salinas River to a point near the Monterey/Pacific Grove city limits, and is generally of high visual quality. North of Reservation road, the proposed seawater intake system and a portion of the Source Water Pipeline would be located within the Beaches and Coastal Dunes landscape unit. South of Reservation Road, an approximately 2-mile segment of the new Transmission Main would be sited within the Beaches and Coastal Dunes landscape unit.

Grass and Rangeland Landscape Unit

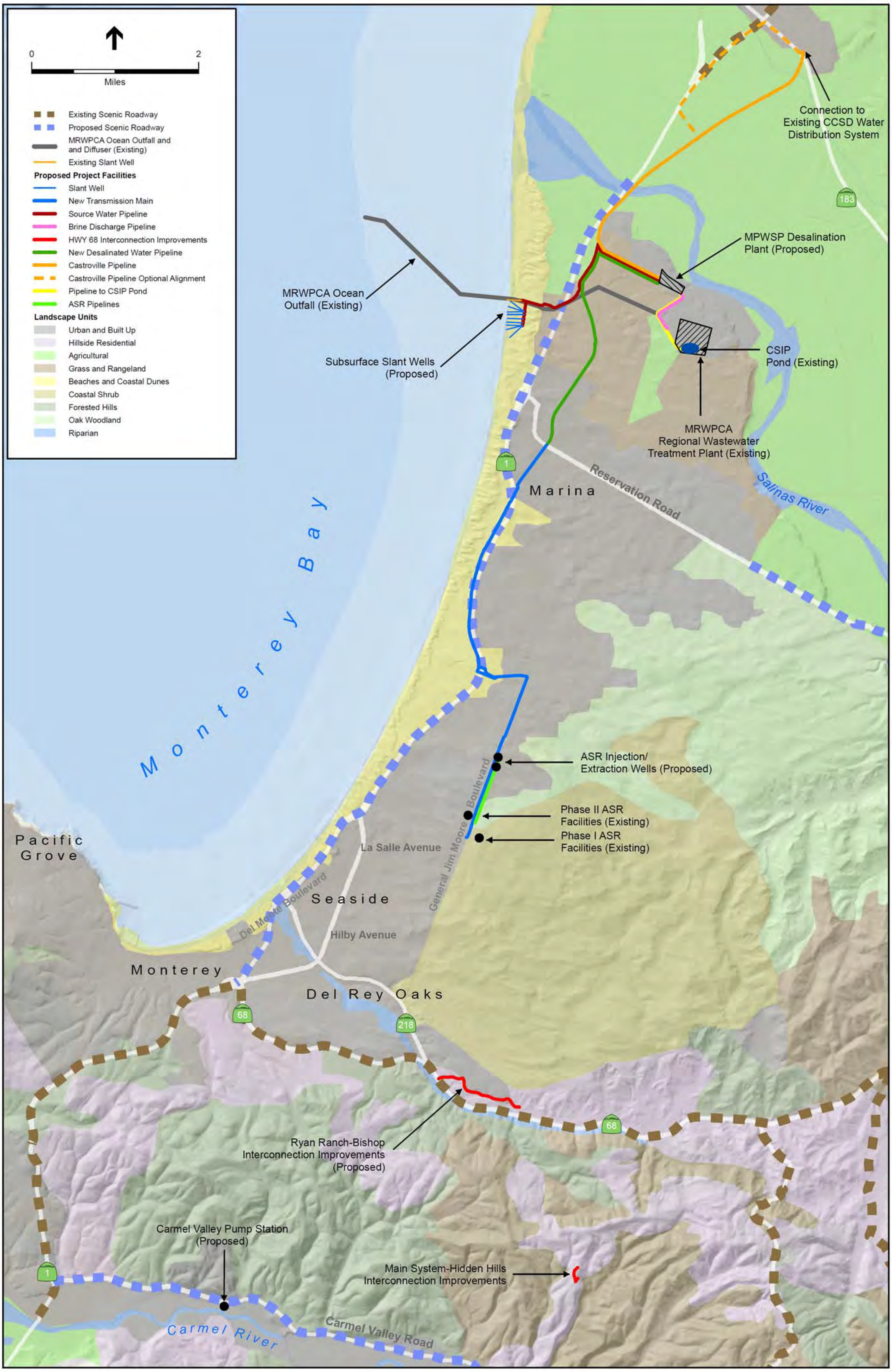
This landscape unit consists of natural grassland habitat or undulating grass-covered hills that have been previously logged or grazed. The visual quality of the Grass and Rangeland landscape unit is moderate to high depending on whether the area has been degraded by human activity. Land uses commonly found in this landscape unit include grazing land, farmland, and utility infrastructure. Portions of the proposed new Desalinated Water Pipeline, Source Water Pipeline, Pipeline to CSIP Pond, Brine Mixing Box, and Brine Discharge Pipeline would be constructed within or adjacent to the Grass and Rangeland landscape unit north of Reservation Road. No project components would be located within the Grass and Rangeland landscape unit south of Reservation Road.

Riparian Landscape Unit

This landscape unit consists of wetlands, marshes, sloughs, and stream corridors. These areas are often flat and contain wetland vegetation and riparian trees, including cottonwood, sycamores, and willows. Views of the sky and surroundings in the Riparian landscape unit are limited because of the low elevation. However, the presence of water, pleasing color contrasts, and a variety in vegetation give moderate to high visual quality to this landscape. North of Reservation Road, a segment of the proposed Castroville Pipeline would cross the Riparian Landscape Unit at the Salinas River. There are no proposed MPWSP facilities south of Reservation Road that would occur within the Riparian Landscape Unit.

Oak Woodland Landscape Unit

Patches of coast live oak woodland are in areas containing older, more stable and developed soils. The Oak Woodland landscape unit, which is present in and around the former Fort Ord military base, has a dense to moderately open canopy and sparse herbaceous understory. The topography of this landscape unit consists of hills with gentle to moderate slopes. The Oak Woodland unit has a savannah-like to more densely wooded appearance, depending on canopy cover, which ranges



SOURCE: ESA, 2016; Monterey County, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.14-1
Landscape Units and Scenic Roadways

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PL Urban Builtup Monterey

Hillside Residential

Agricultural

AG & Coastal Dunes

NM Rangeland

Riparian and Built up

Coastal Scrub

Oak Woodland

TF Forested Hills

SOURCE: ESA

MPWSP 205335.01

Figure 4.14-2

Landscape Units of Northern Monterey Coastal Area from 20 to 60 percent of the ground surface. The visual quality of this landscape is moderate to high because this unit is primarily open space with minimal or no anthropogenic changes. There are no MPWSP facilities proposed for the Oak Woodland landscape unit.

Forested Hills Landscape Unit

This landscape unit primarily occurs in the mountains between the Pacific Ocean and the Carmel Valley, along the Highway 68 corridor, and in the Carmel Valley. The Forested Hills landscape unit consists almost entirely of large evergreen trees on moderate to steep slopes. Roads may crisscross the landscape, but these areas are typically remote and devoid of homes or other structures. The visual quality of this landscape is moderate to high depending on the steepness of topography, availability of views, and the degree of forest cover. There are no project components proposed within or adjacent to this landscape unit.

4.14.2.3 Visual Setting of the Project Area

This subsection describes the existing visual character of the areas in which MPWSP components would be constructed. In addition, photographs taken from representative public vantage points portrays the visual character of these locations. **Figure 4.14-2** presents the general setting photographs, which represent the landscape units depicted in **Figure 4.14-1**. **Figures 4.14-3a** and **4.14-3b** depict specific sites where MPWSP components are proposed.

The visual setting of each proposed facility site is described below in terms of its location within a particular landscape unit and its visual quality, visual sensitivity, and landscape exposure. The assigned rating for aesthetic resource value (low, moderate, or high) is based on a combination of these three factors, as shown in the matrix provided in **Table 4.14-1**. Existing lighting conditions at each site are also described relative to currently visible light sources.

Subsurface Slant Wells

The proposed subsurface slant wells would be located west of Highway 1 in the Beaches and Coastal Dunes landscape unit at the CEMEX sand mining facility (see **Figure 4.14-3a**, Photo 1). The CEMEX site is characterized by highly disturbed, relatively uniform sandy basins that are devoid of vegetation and surrounded by steeply sloping, sparsely vegetated, white-sand dunes. The site contains cleared and bladed roads through the dunes and vegetation; dewatering pits; material stockpiles; a graveled equipment staging area and storage yard; several one-story administrative and warehouse structures; and several pieces of heavy equipment. Views of the area from passing vehicles on Highway 1 are partially screened by the intervening dunes and Monterey cypress trees along the site's eastern (landward) perimeter. Most of the site's facilities and operations are not visible from the beach, due to the intervening dune topography. A sand road and several vertical structures are visible from the beach (e.g., processing plant and bollards protecting an existing monitoring well). However, they generally appear distant and subordinate to the existing dune landscape features. Sources of light and glare in the vicinity include nighttime lighting emanating from the CEMEX facility and low-volume automobile headlights from Highway 1. The visual quality of the Beaches and Coastal Dunes landscape unit is generally high. However, due to

Photo 1. East-facing view of the CEMEX sand mining facility from beach access road (ESA, 2013).

Photo 2. Southeast-facing view from site of proposed MPWSP Desalination Plant (right) toward the Monterey Regional Environmental Park (ESA, 2013).

Photo 3. East-facing view from Charles Benson Road entrance to Monterey Regional Water Pollution Control Agency's Wastewater Treatment Plant site (ESA, 2013).

Photo 4. Northeast-facing view along General Jim Moore Boulevard of the proposed ASR injection/extraction wells site (ESA, 2013).

SOURCE: ESA, 2014

205335.01 Monterey Peninsula Water Supply Project

Figure 4.14-3a
Existing Setting

Photo 5. East-facing view of Fremont Street along new Monterey Pipeline alignment (ESA, 2013).

Photo 6 removed from Final EIR/EIS; Terminal Reservoir no longer proposed.

Photo 7. South-facing view of Monterey Pump Station site (ESA, 2013).

Photo 8. South-facing view of Carmel Valley Pump Station site (ESA, 2014).

SOURCE: ESA, 2014

205335.01 Monterey Peninsula Water Supply Project

Figure 4.14-3b

Existing Setting

extensive alterations to the natural features at the CEMEX facility, the visual quality of the site is considered moderate. The site's visual sensitivity is high because of its location along the coast and proximity to Highway 1, which is an eligible state scenic highway. The visual exposure of the site is low, since the site is partially screened by dunes and trees and is mainly visible only from automobiles traveling along Highway 1 at speeds of 60 miles per hour. Based on the above-described factors, the site for the proposed subsurface slant wells has a moderate aesthetic resource value.

MPWSP Desalination Plant

The proposed MPWSP Desalination Plant site lies within the Urban and Built-up landscape unit, adjacent to Charles Benson Road, southeast of the Dole and Budweiser processing facility at the northeast corner of Monte Road and Neponset Road, and northwest of the Monterey Regional Environmental Park, also known as the Monterey County landfill. The site is bordered on the west and north by agricultural lands and the Salinas River, and on the south by Armstrong Ranch. The proposed MPWSP Desalination Plant site was previously used for agricultural production but is currently fallow; as a result, the site is mainly composed of dead, low-lying, ruderal brush. The landscape of the proposed site is highly disturbed, with old crop rows evident in the soil beneath the dead brush (see **Figure 4.14-3a**, Photo 2). To the northwest, the Dole and Budweiser processing facility consists of warehouses and a large asphalt loading, sorting, and truck staging/parking yard with outdoor lighting for nighttime activities. To the southeast, development within the adjacent Monterey Regional Environmental Park consists of office buildings and. Structures on the Monterey Regional Environmental Park site range in size from one- to two-story buildings (up to approximately 30 feet tall), ranging in size from approximately 4,500 square feet to over 100,000 square feet. South of the Monterey Regional Environmental Park lies the several-hundred-acre Monterey Regional Water Pollution Control Agency's (MRWPCA) Regional Wastewater Treatment Plant and drying beds. The treatment plant includes primary clarifiers, trickling filters, and a generation plant, each rising to heights of approximately 35 to 45 feet (see **Figure 4.14-3a**, Photo 3).

Existing sources of light and glare near the MPWSP Desalination Plant site include automobile headlights along Charles Benson Road, nighttime lighting from the Dole and Budweiser processing facility, and nighttime security lighting from adjacent agricultural operations and the Monterey Regional Environmental Park. Overall, given the site's location within the Urban and Built-up landscape unit, and considering the industrial development surrounding the site, the visual quality is considered low. The visual exposure is low because this site is only seen for short durations by travelers along Charles Benson Road and is screened by rows of trees to the south and west. The visual sensitivity of the site is also rated low, as the area is not located within a vista or view corridor and is not valued for recreational uses. Based on the above-described factors, the aesthetic resource value of the MPWSP Desalination Plant site is low.

Pipelines and Other Conveyance Facilities North of Reservation Road

All pipeline segments, including those proposed for areas north of Reservation Road, would be buried beneath the ground surface.

Source Water Pipeline

The Source Water Pipeline alignment would traverse approximately 2.2 miles of mostly undeveloped terrain in the Beaches and Coastal Dunes, Grass and Rangeland, and Urban and Built-up landscape units, characterized by mostly open and flat terrain consisting of coastal scrub, grassland, and agricultural fields. The proposed alignment would extend east along the CEMEX access road from the proposed subsurface slant wells (described above), past agricultural lands, and beneath Highway 1 to Lapis Road. Along Lapis Road, the Source Water Pipeline would be collocated with the new Desalinated Water Pipeline and extend north within or adjacent to the existing road rights-of-way. The pipeline would continue south along Del Monte Boulevard to Charles Benson Road. The approximately 0.8-mile segment of the proposed Source Water Pipeline between Del Monte Boulevard and the proposed MPWSP Desalination Plant site, and the Source Water Pipeline Optional Alignment, would be constructed along Charles Benson Road. This segment would traverse Urban and Built-up and Grass and Rangeland landscape units, characterized by increasingly intensive land uses and with views more constrained by topography and mature cypress trees along Charles Benson Road.

Sources of light and glare in the surrounding area include nighttime lighting emanating from the CEMEX sand mining facility and the Monterey Regional Environmental Park, and headlights from low-volume automobile traffic along nearby roadways. Overall, given its location along Highway 1 (an eligible state scenic highway) and the Monterey Peninsula Recreational Trail, the visual sensitivity of the proposed Source Water Pipeline alignment is considered high. Because of the alignment's proximity to the coast and Highway 1 as well as its location within visually appealing topography, there is a high likelihood that the public would notice visual changes along the proposed pipeline alignment. However, because the alignment area is only fleetingly visible, mainly by local and regional motorists traveling along Highway 1 (at speeds of 60 miles per hour) or from Del Monte Boulevard, Lapis Road, and Charles Benson Road, the visual exposure of the alignment would be low. Because the proposed alignment would traverse varied landscapes, it is given a moderate rating for visual quality. Based on the above-described factors, the aesthetic resource value of the proposed alignment for the Source Water Pipeline is moderate.

New Desalinated Water Pipeline

For purposes of the visual setting, the approximately 0.8-mile segment of the proposed new Desalinated Water Pipeline between Del Monte Boulevard and the proposed MPWSP Desalination Plant site, and the new Desalinated Water Pipeline Optional Alignment, would occur within the same setting as described above for the Source Water Pipeline Optional Alignment and corresponding segment of the proposed Source Water Pipeline. The segments of the new Desalinated Water Pipeline proposed along Lapis Road and Del Monte Boulevard north of Marina Green Drive would occur within the Grass and Rangeland landscape unit (containing mostly undeveloped terrain, low scrub vegetation, and fallow fields). The segment along Del Monte Boulevard south of Marina Green Drive would occur within the Urban and Built-up landscape unit, characterized by light industrial, commercial and residential development, and intermittent open space areas. Sources of light and glare in the surrounding area include nighttime lighting emanating from existing development along Charles Benson Road and within the city of Marina and low-volume automobile headlights along nearby roadways.

Overall, given the new Desalinated Water Pipeline's location along a portion of the Monterey Peninsula Recreational Trail, the visual sensitivity of this alignment is considered moderate. For the same reason, there is a high likelihood that the public would notice visual changes along the pipeline alignment. However, because the alignment area is only fleetingly visible, mainly by local and regional motorists traveling along Highway 1 (at speeds of 60 miles per hour), or people traveling along Del Monte Boulevard, Lapis Road, and Charles Benson Road, the visual exposure of the alignment would be low. Given that the proposed pipeline would pass through both vast open space areas of fairly high visual quality and more densely developed areas of lower visual quality, the alignment is given a moderate rating for visual quality. Based on the above-described factors, the aesthetic resource value of the new Desalinated Water Pipeline route is moderate.

Castroville Pipeline

The approximately 0.8-mile segment of the proposed Castroville Pipeline between proposed MPWSP Desalination Plant site and Del Monte Boulevard, and the Castroville Pipeline Optional Alignment 2, would occur within the same setting as the Source Water Pipeline, Source Water Pipeline Optional Alignment, new Desalinated Water Pipeline, and new Desalinated Water Pipeline Optional Alignment. The segment extending from Del Monte Boulevard to the CCSD Well #3 on Merritt Street would follow the TAMC right-of-way. The proposed route is almost entirely within the Agricultural landscape unit, characterized by predominantly flat agricultural land in row crop production, and with expansive views of exposed earth, silhouettes of far-off hills, and big skies. There are few sources of nighttime lighting along the proposed alignment; those that do exist are generally limited to distant vehicle headlights and exterior lighting from development in the Castroville area near the alignment's northern terminus. Given the uniformity of the landscape form and pattern, the sweeping views, and its proximity to proposed and designated scenic highways, the alignment is considered to have a moderate scenic quality. Similarly, given the agricultural landscape's contribution to the scenic appeal of this region, the visual sensitivity of the alignment is also considered moderate. The landscape exposure of the alignment is considered low, owing to its lack of prominence in views from public vantage points; the alignment may be visible, but is not conspicuous to motorists traveling along Highways 1 or 156. Based on the above-described factors, the aesthetic resource value of the above-described segment of the Castroville Pipeline is moderate.

Castroville Pipeline Optional Alignment 1

Castroville Pipeline Optional Alignment 1 is within both the Agricultural and Urban and Built-up landscape units. The landscape character in the vicinity of Nashua Road and the Monterey Peninsula Recreational Trail is predominantly flat agricultural land in row crop production. The character of the segment along Merritt Way and Merritt Street is urban, dominated by commercial and light industrial type development. Sources of nighttime lighting include vehicles traveling along Highways 1 and 156, and exterior lighting from development in the Castroville area. For the reasons described for the proposed Castroville Pipeline, above, and with consideration for

Castroville's urban character, Optional Alignment is considered to have a moderate scenic quality and visual sensitivity. The landscape exposure of Optional Alignment is high; the alignment north of Nashua Road is visible to a large number of northbound motorists traveling on Highways 1 and 156 and users of the Monterey Peninsula Recreational Trail. However, as the alignment area is visible primarily to viewers in motion, views of the alignment are generally only fleetingly visible. For the above reasons, the aesthetic resource value of the Castroville Pipeline Optional Alignment is moderate.

Brine Discharge Pipeline and Pipeline to CSIP Pond

The proposed Brine Discharge Pipeline and Pipeline to CSIP Pond would extend from the MPWSP Desalination Plant site to the southern portion of the Monterey Regional Environmental Park. The Brine Mixing Box would be located at the southern terminus of the Brine Discharge Pipeline. The pipelines would be sited at the intersection of Grass and Rangeland, Urban and Built-up, and Agricultural landscape units, characterized by undeveloped grasslands and agricultural fields to the south and southwest and the Monterey Regional Environmental Park MRWPCA Treatment Plant to the north and east. Sources of light and glare in the surrounding area include nighttime lighting emanating from the Monterey Regional Environmental Park and MRWPCA Treatment Plant, and automobile headlights along Charles Benson Road.

The visual exposure of the site is low because it is only seen for short durations by motorists traveling along Charles Benson Road or by visitors to the Monterey Regional Environmental Park. Furthermore, the visual sensitivity is low, as the area is not located within a vista or view corridor and is not valued for recreational uses. Given the surrounding industrial development, the visual quality is considered low. Based on the above-described factors, the aesthetic resource value of the proposed Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond alignments is low.

Improvements to ASR System

ASR-5 and ASR-6 Wells

The proposed ASR-5 and ASR-6 Wells would be located in an area that is currently vegetated with oak and conifer trees in the Fitch Park military housing community, within the Urban and Built-up landscape unit (see **Figure 4.14-3a**, Photo 4). In the project vicinity, General Jim Moore Boulevard is a recently improved north-south thoroughfare surrounded by open space, recreational facilities, and suburban land uses. This four-lane roadway has two travel lanes in each direction, separated by a landscaped median. The densely vegetated surroundings of the ASR injection/extraction wells sites contribute to a moderate visual quality. Potential sources of light and glare include automobile headlights, streetlights along General Jim Moore Boulevard, nearby golf course facilities, and adjacent residential areas.

While numerous residences are located in the area, the ASR-5 and ASR-6 Wells would be visible only from those few homes adjacent to and west of General Jim Moore Boulevard. However, General Jim Moore Boulevard itself supports high daily traffic volumes, and the proposed ASR-5 and ASR-6 Wells sites would be slightly elevated above the road. As such, the sites are visible for short durations by motorists along this transportation corridor, and for longer durations by pedestrians and bicyclists. Therefore, the visual exposure of the ASR-5 and ASR-6 Wells sites is considered moderate. Additionally, while these facilities would not be within view of any designated scenic vistas or corridors, they would be located in a heavily vegetated area. Therefore, the visual sensitivity of the area is considered moderate. Based on the above-described factors, the aesthetic resource value of the area is moderate.

ASR Pipelines

The ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline would extend along General Jim Moore Boulevard between the proposed ASR-5 and ASR-6 wells and existing facilities at Coe Avenue. The proposed pipelines would be sited within the road right-of-way, between the Urban and Built-up and Oak Woodland landscape units. Heading south from the ASR-5 and ASR-6 Wells, the landscape in this area is characterized by medium-density residential development and open space with dense stands of tall scrub vegetation and varying topography to the east, and golf course and public institutional development to the west. Sources of light and glare in the area include automobile headlights, streetlights along General Jim Moore Boulevard, nearby golf course facilities, and adjacent residential areas.

Despite the alignment's location within the Urban and Built-up landscape unit, the densely vegetated and open space areas on either side of the alignment contribute to the landscape's moderate visual quality. The pipeline would be sited within the road right-of-way, which is not an element important to the landscape's overall aesthetic appeal; therefore, the alignment is considered to have a low visual sensitivity. The alignment is visible primarily to motorists, but also cyclists and pedestrians traveling along General Jim Moore Boulevard. However, portions of the alignment may also be visible from residences situated along the roadway. As a result, the visual exposure is considered moderate. Based on the above-described factors, the aesthetic resource value for the proposed ASR Pipelines route is moderate.

Pipelines and Other Conveyance Facilities South of Reservation Road

New Transmission Main

The new Transmission Main would extend from its connection with the new Desalinated Water Pipeline at Reservation Road in Marina to existing facilities at the General Jim Moore Boulevard/Coe Avenue intersection in Seaside. The alignment would be sited within the Urban and Built-up and Beaches and Coastal Dunes landscape units— the former generally occurring to the east of Highway 1 and the latter generally occurring to the west. The character of the alignment area within Marina, east of Highway 1, is similar to that described previously for the adjacent segment of the new Desalinated Water Pipeline (south of Marina Green Drive), defined primarily by medium-density commercial and residential development. The visual character of the alignment area west of Highway 1, including that of the new Transmission Main optional alignment, is defined by the adjacent highway to the east and mostly undeveloped expanses of coastal dunes, low-lying dune vegetation, and intermittent glimpses of the ocean to the west. The character of the alignment area within Seaside, east of Highway 1, is similar to that described previously for the ASR pipelines, defined by low density institutional and commercial development and residential communities, interspersed with large and mostly undeveloped patches of mature coastal scrub vegetation. Sources of light and glare along the alignment include nighttime lighting emanating from the developments in the vicinities of segments east of Highway 1, as well as automobile headlights along nearby roadways.

The visual quality of the proposed new Transmission Main alignment area overall is considered moderate, accounting for the mostly undeveloped coastal dunes landscape and associated views along the west side of Highway 1, as well as the more varied mix of urban, suburban, and open landscapes to the east. The visual sensitivity of the alignment area is considered moderate; segments to the west of Highway 1 are scenic areas, whereas segments along the more varied landscapes east of Highway 1 have less aesthetic appeal. The exposure of the site is considered high; the alignment area would be visible to users of the Monterey Peninsula Recreational Trail and motorists along Highway 1 and surface streets, as well as from adjacent residences as described for ASR Pipelines, above. Based on the above-described factors, the aesthetic resource value of the new Transmission Main route is high.

Carmel Valley Pump Station

The Carmel Valley Pump Station would be located approximately 240 feet south of Carmel Valley Road near the intersection of Rancho San Carlos Road. The proposed pump station site falls within the Urban and Built-up landscape unit. The area is characterized by inconspicuous, large-lot, low-density single-family residential development nestled between undulating hills covered in coastal scrub and oak woodlands to the north, and the wooded Carmel River corridor to the south (see **Figure 4.14-3b**, Photo 8). Sources of nighttime lighting include exterior lighting from homes adjacent to the site and headlines from occasional traffic along Carmel Valley and Rancho San Carlos Roads. In this area, Carmel Valley Road is a proposed scenic highway. For these reasons, the visual quality of the landscape is high. However, the site's visual sensitivity and landscape exposure are considered low. Despite its proximity to Carmel Valley Road, the site contributes little to the landscape's aesthetic appeal; the site is flat, disturbed and without mature vegetation, and is not plainly visible from any nearby public vantage point. Based on the above-described factors, the aesthetic resource value of the Carmel Valley Pump Station site is moderate.

Ryan Ranch–Bishop Interconnection Improvements

The Ryan Ranch–Bishop Interconnection Improvements would extend from the intersection of Highway 68 and Ragsdale Drive, through the Ryan Ranch community, and then along Ragsdale Drive, Lower Ragsdale Drive, Wilson Drive, and Blue Larkspur Lane. This route is located between the Hillside Residential and Urban and Built-up landscape units, an area characterized by suburban commercial/business-park development amid large tracts of vegetated open space. Sources of light and glare include nighttime lighting emanating from the surrounding Urban and Built-up landscape and automobile headlights along nearby roadways. The visual sensitivity is considered high given this project component's proximity to Highway 68, which is a state scenic highway. The visual exposure is moderate, as the alignment area is visible to motorists for several blocks. Despite the nearby commercial/business-park development, the vegetated open spaces surrounding the proposed Ryan Ranch–Bishop Interconnection Improvements contribute to a moderate visual quality. Based on the above-described factors, the aesthetic resource value of the Ryan Ranch–Bishop Interconnection Improvements is moderate.

Main System–Hidden Hills Interconnection Improvements

The Main System–Hidden Hills Interconnection Improvements alignment would extend for approximately 1,200 feet along Tierra Grande Drive within the Hillside Residential landscape unit. This area consists of single-family homes on large lots amid rolling hills and vast open spaces. Sources of light and glare include nighttime lighting emanating from nearby residences and automobile headlights along nearby roadways. The visual quality of this landscape unit is moderate due to the semi-natural state and open views of undeveloped lands. The visual exposure of the area is moderate. A small number of residents along Tierra Grande Drive would have views of construction activities associated with the Main System–Hidden Hills Interconnection Improvements. Motorists on upper Tierra Grande Drive would only have fleeting views of construction activities as they drove by the construction zone. The visual sensitivity of the site is rated moderate, because the adjacent area is mostly vegetated and undeveloped, yet not located within a vista or view corridor and not valued for recreational uses. Based on the above-described factors, the aesthetic resource value of the Main System–Hidden Hills Interconnection Improvements is moderate.

4.14.3 Regulatory Framework

This section provides an overview of notable federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines relevant to aesthetic resources. A brief summary of each is provided, along with a finding regarding the MPWSP's consistency with those regulatory requirements. The consistency findings concern the MPWSP as proposed, without mitigation. Where the MPWSP, as proposed, would be consistent with the applicable regulatory requirement, no further discussion of project consistency with that regulatory requirement is provided. Where the MPWSP, as proposed, would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to a specific impact discussion in Section 4.14.6, Direct and Indirect Effects of the Proposed Project, below, where the potential inconsistency is addressed in more detail. Where applicable, the discussion in Section 4.14.6 identifies feasible mitigation that would resolve the potential inconsistency.

4.14.3.1 Federal Regulations

Guidelines for Desalination Plants in the Monterey Bay National Marine Sanctuary

As discussed in previous sections, MBNMS regulations are found in Title 15, Part 922 of the Unites States Code. In addition, the Guidelines for Desalination Plants in the Monterey Bay National Marine Sanctuary ("Desalination Plant Guidelines") were developed to guide siting, review, and development of desalination facilities in a manner that is protective of MBNMS resources. The Guidelines specify that desalination plants should be designed to minimize visual impacts on coastal resources. The subsurface slant wells would be located near the coast. However, due to intervening dune topography, they would be mostly, if not entirely, screened from view from the beach and offshore areas within MBNMS. As such, the project would not be expected to conflict with the Guidelines. Furthermore, mitigation has been identified to ensure that the slant well facilities avoid or minimize contrast with the surrounding setting (see Impact 4.14-3 and Mitigation Measure 4.14-3a, Facility Design). No other MPWSP facilities are proposed for locations that would be visible from MBNMS or would inhibit views of MBNMS. The Desalination Plant Guidelines are further addressed in Section 6.4 of this EIR/EIS.

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972 provides for management of the nation's coastal resources, including the Great Lakes, and balances economic development with environmental conservation. The California Coastal Commission has jurisdiction for CZMA implementation throughout the state.[1] The California Coastal Act contains numerous enforceable policies that are directed at protecting and, where feasible, restoring coastal resources. The California Coastal Commission applies the Coastal Act's policies when reviewing applications for coastal development permits in California state waters, including coastal scenic resources. The Coastal Commission also applies land use policies when reviewing federally licensed and permitted activities to ensure they are consistent with the State's coastal management program in accordance with the CZMA federal consistency provision. The Coastal Commission considers an application for a coastal development permit to cover the requirement for an applicant submitting a consistency certification to the Coastal Commission. Typically, the Coastal Commission will provide its response (concurrence, conditional concurrence, or objection) in its staff report for the coastal development permit.

4.14.3.2 State Regulations

California Scenic Highway Program

Three roadways in the project area—Highway 1, Highway 156, and Highway 68—are officially designated as state scenic highways (see **Figure 4.14-1**; Caltrans, 2011). Their corridors (defined as the area of land roughly adjacent to and visible from the highway) are subject to protection and regulation with respect to land use, site planning, advertising, earthmoving, landscaping, and design. For Caltrans to grant the status of Officially Designated State Scenic Highway, the local jurisdiction(s) must implement a Corridor Protection Program, either by adopting ordinances, zoning, and/or planning policies to preserve the scenic quality of the corridor or by documenting that such regulations already exist in various portions of local codes. Policies to prevent the visual degradation of roadway view corridors include County of Monterey General Plan policy GMP-3.3 and North County Area Plan policy NC-3.1. MPWSP pipeline construction would involve ground disturbance and vegetation removal in proximity to designated scenic highways. However, such disturbances would be temporary, limited to the construction phase and, upon completion of construction, pipeline alignments would be returned to their approximate pre-

[1] Except within the San Francisco Bay-Delta where the Bay Conservation and Development Commission has authority for implementation of CZMA within its jurisdictional area.

construction condition. No other MPWSP components would be visible from designated scenic highways. Therefore, the MPWSP would be consistent with the California Scenic Highway Program.

California Coastal Act

Some MPWSP facilities would be located in the California Coastal Zone, as defined in the California Coastal Act (Section 30103). Land use decisions within the Coastal Zone are subject to the provisions of the Coastal Act, which is administered by the California Coastal Commission. The Coastal Act requires local governments in the Coastal Zone to prepare a Local Coastal Program (LCP) that contains a land use plan and land use regulations to implement provisions of the Coastal Act. Once the Commission "certifies" (approves) the LCP, permit-issuing authority is transferred to the local government, subject to the terms of the certified LCP. For local jurisdictions without a certified LCP, the Commission retains permit-issuing authority under the Coastal Act. As stated in Coastal Act Section 30251, a primary objective of the Coastal Commission is to protect the scenic and visual character of the California coast. The Commission applies this standard to its review of applications for coastal development permits as well as to LCP certifications. For the reasons described for the California Scenic Highway Program, MPWSP construction activities would be consistent with Coastal Act policies related to aesthetic resources. Operation of the MPWSP subsurface slant well operation would be potentially inconsistent with LCP policies for scenic resource protection that implement the Coastal Act's scenic resource protection policies (see Table 4.14-2). Potential effects on such coastal resources are discussed in Impacts 4.14-1 and 4.14-3.

4.14.3.3 Applicable Regional and Local Land Use Plans and Policies

Table 4.14-2 presents the regional and local land use plans, policies, and regulations pertaining to aesthetic resources that are relevant to the MPWSP and that were adopted for the purpose of avoiding or mitigating an environmental effect and indicates project consistency with these regulatory requirements. Where the analysis concludes the proposed project would be consistent with the applicable requirement, the finding is noted and no further discussion is provided. Where the analysis concludes the proposed project would be potentially inconsistent with the applicable requirement, the reader is referred to the specific impact discussion in Section 4.14.6, Direct and Indirect Effects of the Proposed Project. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

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TABLE 4.14-2
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO AESTHETIC RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Land Use - Primary Policies	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 2.4.4:*** Wherever possible, lands with significant agricultural, natural habitat, or scenic value shall be retained and protected from degradation.	This policy is intended to preserve and protect significant landscape values.	<u>Potentially Inconsistent</u>: Pipeline construction would temporarily disrupt the scenic quality of Marina's coastal Highway 1 corridor. However, these facilities would be buried below ground surface. Following construction, work areas would be restored to their approximate pre-construction condition. Elements of the subsurface slant wells would be located aboveground and could be visible from the beach. This issue is addressed in Impact 4.14-3, which identifies mitigation measures that would minimize or avoid this potential inconsistency. *The project's implications for agricultural and biological resources are discussed in EIR/EIS Sections 4.16 and 4.6, respectively. Refer to **Tables 4.16-2** and **4.6-2** for additional discussion of project's conformity with applicable Marina General Plan policies related to these resource areas, respectively.*
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design & Development - Open Spaces and Significant Natural Features	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.17.3:*** Within built-up areas, existing topography shall be retained to make natural land forms more evident. This requirement of the General Plan may be fulfilled by minimizing grading and cutting and filling for roadways, by providing public space with outlooks at the higher elevations, and by locating taller structures on the upper slopes of hills.	This policy is intended to protect the visual integrity of natural landforms.	<u>Consistent</u>: Pipelines and the MPWSP seawater intake system would be sited primarily within previously disturbed areas and not involve substantial grading that would result in noticeable landform alterations in built-up areas.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design & Development – Scenic and Cultural Resources	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.126.3:*** The visual character and scenic resources of the Marina Planning Area shall be protected for the enjoyment of current and future generations. To this end, ocean views from Highway One shall be maintained to the greatest possible extent; development on the primary ridgeline of the Marina dunes shall be avoided; new development proposed for the Armstrong Ranch should maintain an adequate setback from Highway One; landscape screening and restoration shall be provided as appropriate; new development should be sited and designed to retain scenic views of inland hills from Highway One, Reservation Road, and Blanco Road; and architectural review of projects shall continue to be required to ensure that building design and siting, materials, and landscaping are visually compatible with the surrounding areas.	This policy is intended to preserve and protect Marina's visual character and scenic resources.	<u>Consistent</u>: Pipeline and well construction would temporarily disrupt the scenic quality of Marina's coastal Highway 1 corridor. All pipelines would be buried below grounds surface. As discussed in Chapter 3, Description of the Proposed Project, following construction, all pipeline areas would be restored to their approximate pre-construction condition. Above-ground components of the subsurface slant wells would be low profile (8-12 inches in height) and distant (0.5 mile) from Highway 1. At this distance, these facilities would not be noticeable or obstruct coastal views from Highway 1.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 33:*** To protect scenic and visual qualities of the Coastal area including protection of natural landforms, views to and along the ocean, and restoration and enhancement of visually degraded areas except in areas presently being mined.	This policy is intended to protect and enhance the scenic and visual quality of the Marina coast.	<u>Potentially Inconsistent</u>: Elements of the subsurface slant wells would be located aboveground; the above ground features could be visible, and the test well would be visible from the beach. This issue is addressed in Impact 4.14-3, which identifies mitigation measures that would minimize or avoid this potential inconsistency.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Conservation/ Open Space	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Policy COS 8.1:*** Participate in local and regional efforts to reduce light pollution of night skies.	This policy is intended to protect dark night skies from impacts of light pollution.	<u>Consistent:</u> None of the project components proposed within Seaside's jurisdiction would require nighttime construction or lighting. The ASR-5 and ASR-6 Wells may require temporary nighttime construction and nighttime lighting. However, these project components are proposed for lands under federal jurisdiction and, therefore, would not be subject to Seaside General Plan policies.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Urban Design	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Policy UD-1.1:*** Enhance the City's image and identity within the region's natural setting.	This policy is intended to ensure the aesthetic character of new development within the city is compatible with that of its natural surroundings.	<u>Consistent:</u> The ASR-5 and ASR-6 Wells would be constructed above ground and within Seaside, but would not be subject to this policy because they would be sited on federal lands. The remaining project components proposed within Seaside would not involve aboveground elements.

TABLE 4.14-2 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO AESTHETIC RESOURCES

Project Planning Region	Applicable Planning Document	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Urban Design	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Policy UD-3.1***: Protect private views of significant natural features, such as the Monterey Bay, Roberts Lake, the Pacific Ocean, the surrounding mountains and other important viewsheds.	This policy is intended to protect private views from disruption caused by new development.	Consistent: The ASR-5 and ASR-6 Wells would be constructed above ground and within Seaside, but would not be subject to this policy because they would be sited on federal lands. The remaining project components proposed within Seaside would not involve aboveground elements.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Urban Design	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Policy UD-3.2***: Preserve the unique public views visible from the Highway 1 Corridor between Fremont Boulevard and the northern boundary of the city as identified in the Fort Ord Reuse Authority (FORA) Plan.	This policy is intended to protect designated important public view corridors within the city.	Consistent: The proposed project would involve no aboveground components between Fremont Boulevard and the northern boundary of the city that would be visible from the Highway 1 corridor. Therefore, no unique views would be affected.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Urban Design	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Implementation Plan UD-3.2.1***: Establish and enforce design guidelines in the Seaside Zoning Ordinance to preserve and protect the public viewsheds.	This policy is intended to protect designated important public viewsheds within the city.	Consistent: No above-ground project components are proposed within a Seaside designated public viewshed.
County of Monterey (inland areas)	Carmel Valley Master Plan	Area Development	Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements	***Policy CV-1.20:*** Design ("D") and site control ("S") overlay district designations shall be applied to the Carmel Valley area. Design review for all new development throughout the Valley, including proposals for existing lots of record, utilities, heavy commercial, and visitor accommodations, but excluding minor additions to existing development where those changes are not conspicuous from outside of the property, shall consider the following guidelines: b. Development either shall be visually compatible with the character of the valley and immediate surrounding areas or shall enhance the quality of areas that have been degraded by existing development. c. Materials and colors used in construction shall be selected for compatibility with the structural system of the building and with the appearance of the building's natural and man-made surroundings.	This policy is intended to ensure visual compatibility of development within the Carmel Valley Master Plan area.	Consistent: The Carmel Valley Pump Station would be comparable in scale to surrounding development. Further, prior to approval, the Carmel Valley Pump Station would be required to undergo design review, which would ensure policy conformity. The Main System-Hidden Hills Interconnection Improvements would be buried below ground and, therefore, would be visually compatible with the immediate surrounding areas.
County of Monterey (inland areas)	Greater Monterey Peninsula Area Plan	Conservation/Open space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements	***Policy GMP-3.3:*** The Greater Monterey Peninsula Scenic Highway Corridors and Visual Sensitivity Map (Figure 14) shall be used to designate visually "sensitive" and "highly sensitive" areas generally visible from designated Scenic Highways. The following policies shall apply to areas that have one of these designations: ***Part e:*** New development to be located in areas mapped as "sensitive" or "highly sensitive" and which would be visible from a designated scenic route shall maintain the visual character of the area. In order to adequately mitigate the visual impacts of development in such areas, the following shall be required: 1. Development shall be rendered compatible with the visual character of the area using appropriate siting, design, materials, and landscaping; 2. Development shall maintain no less than a 100-foot setback from the scenic route right-of-way; 3. The impact of any earth movement associated with the development shall be mitigated in such a manner that permanent scarring is not created; 4. Tree removal shall be minimized; 5. Landscape screening and restoration shall consist of locally native plant and tree species consistent with surrounding native vegetation; 6. Architectural review of projects shall be required to ensure visual compatibility of the development with the surrounding area; and 7. New development in open grassland areas shall minimize its impact on the uninterrupted viewshed.	This policy is intended to protect designated important views of scenic areas generally visible from designated scenic highways.	Consistent: Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, and Ryan Ranch-Bishop Interconnection Improvements construction activities would occur within areas identified by the County as "sensitive" or "highly sensitive" and would be visible during construction from designated or eligible scenic highways. However, as discussed in Chapter 3, Description of the Proposed Project, construction-period disturbance would be temporary and all pipeline construction areas would be restored to their approximate pre-construction condition.

TABLE 4.14-2 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO AESTHETIC RESOURCES

Project Planning Region	Applicable Planning Document	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (inland areas)	Greater Monterey Peninsula Area Plan	Conservation/Open space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements	***Policy GMP-3.4*** Plant materials shall be used to integrate manmade and natural environments, to screen or soften the visual impact of new development, and to provide diversity in developed areas.	The intent of this policy is to soften and screen the visual impact of new development.	Consistent: Views of the proposed MPWSP Desalination Plant would be screened by existing trees along Charles Benson Road. The Carmel Valley Pump Station would be comparable in size and scale to surrounding development and not plainly visible from adjacent roadways. Therefore, additional vegetative screening is not expected to be necessary. Nevertheless, prior to approval, the Carmel Valley Pump Station would be required to undergo design review, which would ensure policy conformity. All pipelines would be buried below ground so would have no visual impact requiring screening.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***Policy OS-1.1:*** Voluntary restrictions to the development potential of property located in designated visually sensitive areas shall be encouraged.	This policy in intended to protect visually sensitive areas from new development.	Consistent: The Carmel Valley Station would be the only above-ground project component constructed within a Monterey County-designated visually sensitive area. This facility would be small, relative to its surroundings, and would be located on a disturbed site that is not plainly visible from nearby roadways. As discussed in Chapter 3, Description of the Proposed Project (), construction-period disturbance would be temporary and all pipeline construction areas would be restored to their approximate pre-construction condition. All pipelines would be buried below ground.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***Policy OS-1.2:*** Development in designated visually sensitive areas shall be subordinate to the natural features of the area.	This policy in intended to limit development in a way that will preserve natural features in visually sensitive areas.	Consistent: The Carmel Valley Pump Station would be the only above-ground project component constructed within a Monterey County-designated visually sensitive area. At 500-square-feet, this facility would be subordinate to the natural features of the area. As discussed in Chapter 3, Description of the Proposed Project, construction-period disturbance would be temporary and all pipeline construction areas would be restored to their approximate pre-construction condition. All pipelines would be buried below ground.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***Policy OS-1.12:*** The significant disruption of views from designated scenic routes shall be mitigated through use of appropriate materials, scale, lighting and siting of development. Routine and Ongoing Agricultural Activities shall be exempt from this policy, except: 1) large-scale agricultural processing facilities, or 2) facilities governed by the Agricultural and Winery Corridor Plan.	This policy is intended to reduce the disruption of view from designated scenic routes through application of mitigation measures.	Consistent: The proposed project would not involve any components that would significantly disrupt views from designated scenic routes such as Highways 1 or 68.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy OS-5.5:*** Landowners and developers shall be encouraged to preserve the integrity of existing terrain and native vegetation in visually sensitive areas such as hillsides, ridges, and watersheds. Routine and Ongoing Agricultural Activities shall be exempt from this policy.	This policy is intended to protect the natural character of visually sensitive areas.	Consistent: Construction of the MPWSP Desalination Plant and Carmel Valley Pump Station are proposed for construction on previously disturbed sites and would not require substantial alteration of natural terrain or native vegetation. All pipelines would be buried below ground. Pipeline construction period activities could require alterations to existing natural terrain and removal of native vegetation. However, as discussed in Chapter 3, Description of the Proposed Project, upon completion of construction, all pipeline construction areas would be restored to their approximate preconstruction condition.

TABLE 4.14-2 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO AESTHETIC RESOURCES

Project Planning Region	Applicable Planning Document	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.2.2.1:*** Views to and along the ocean shoreline from Highway 1, Molera Road, Struve Road, and public beaches, and to and along the shoreline of Elkhorn Slough from public vantage points shall be protected.	This policy is intended to protect important public views two and along the shoreline.	Consistent: Source Water Pipeline and new Desalinated Water Pipeline construction activities would be temporarily visible from Highway 1. However, as discussed in Chapter 3, Description of the Proposed Project, the pipelines would be buried below ground and all pipeline construction areas would be restored to their approximate pre-construction conditions. Once constructed, the Source Water Pipeline and new Desalinated Water Pipeline would not interfere with views to and along the shoreline from Highway 1.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.2.2.2*:** The coastal dunes and beaches, estuaries, and wetlands should be designated for recreation or environmental conservation land uses that are compatible with protection of scenic resources. Facilities that are provided to accompany such uses shall be designed and sited to be unobtrusive and compatible with the visual character of the area.	This policy is intended to protect the visual character and recreational opportunities of dunes, beaches, estuaries, and wetlands from incompatible land uses.	Consistent: Within North County Land Use Plan area, the Source Water Pipeline and new Desalinated Water Pipeline would be constructed within existing disturbed roadway and railroad rights-of-way, and not be sited in dunes, beaches, wetlands, or estuaries. Therefore no such scenic resources would be affected.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.2.2.4*:** The least visually obtrusive portion of a parcel should be considered the most desirable site for the location of new structures. Structures should be located where existing topography and vegetation provide natural screening.	This policy is intended to minimize the visual impact of a new structure.	Consistent: The Source Water Pipeline and new Desalinated Water Pipeline would be sited within or along existing disturbed roadway and railroad rights-of-way. Once constructed, these facilities would be buried below ground and not be visible.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.2.2.5*:** Structures should be located to minimize tree removal and grading for the building site and access road. Disturbed slopes should be returned to their previous visual quality. Landscape screening and restoration should consist of plant and tree species complementing the native growth of the area.	This policy is intended to minimize the disruption to the landscape's visual quality tree removal and grading,	Consistent: The Source Water Pipeline and new Desalinated Water Pipeline would require trenching along existing disturbed roadway and railroad rights-of-way. However, as discussed in Chapter 3, Description of the Proposed Project, disturbed pipeline construction areas would be restored to their approximate pre-construction condition.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.2.3.3*:** Structures shall generally be sited so as not to block public views of the shoreline; development proposals shall be revised if necessary to accomplish this goal. Necessary structures in public view between the road and the shoreline (such as agricultural buildings) shall be functionally designed and sited as to protect the maximum possible open views. Other development in public view between the road and the shoreline (such as residential or commercial structures) shall be designed with materials, colors, landscaping, and fencing appropriate to the rural setting.	This policy is intended to protect important public views two and along the shoreline.	Consistent: The Source Water Pipeline and new Desalinated Water Pipeline would be buried below ground and would not block public views of the shoreline. Disturbed pipeline construction areas would be restored to their approximate pre-construction condition.
County of Monterey (inland areas)	North County Area Plan	Conservation/Ope n Space	Castroville Pipeline	**NC-3.1.** Within areas designated as "sensitive" or "highly sensitive" on the Scenic Highway Corridors and Visual Sensitivity Map (Figure 15), landscaping or new development may be permitted if the development is located and designed in such a manner that public views are not disrupted.	This policy is intended to protect important public views to and along scenic highway corridors and visually sensitive areas.	Consistent: The Castroville Pipeline would be buried below ground and would not permanently disrupt public views. Disturbed pipeline construction areas would be restored to their approximate pre-construction condition.

SOURCES: City of Marina, 2000, 1982; City of Seaside, 2004, 2013; Monterey County, 1982, 1985, 1996, 2010a, 2010b.

4.14.4 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to aesthetic resources if it would:

- Have a substantial adverse effect on a scenic vista or visual impact on coastal resources;
- Substantially damage a scenic resource, including but not limited to trees, rock outcroppings, and historic buildings, within a state scenic highway corridor;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a substantial new source of light or glare that would adversely affect day or nighttime views in the area.

4.14.5 Approach to Analysis

This analysis of impacts on aesthetic resources examines the temporary (i.e., construction) and permanent (i.e., operational) effects of the proposed project based on application of the significance criteria outlined above. The analysis is divided into two main categories: (1) temporary and permanent scenic resource and visual character impacts, and (2) temporary and permanent lighting and glare impacts. Each criterion is discussed in the context of project components that share similar characteristics and/or geography. This structure parallels that of the environmental context, or setting, as presented in Section 4.14.2.3, Visual Setting of the Project Area. The impact conclusions consider the potential for changes in environmental conditions as well as consistency with applicable regulatory requirements enacted to protect the environment. Unless otherwise specified, the impact analysis and determinations for pipelines with optional alignments consider and apply to both the proposed pipeline alignment and optional alignment(s). The cumulative effects of the proposed project, when considered together with the effects of other past, present, and reasonably foreseeable future projects, are discussed in Section 4.14.7, Cumulative Effects of the Proposed Project.

The impact analysis is based on field observations conducted by ESA in September 2013 and April 2016; review of project maps and drawings; analysis of aerial and ground-level photographs; and review of a variety of data available in public records, including local planning documents. The determination that a project component would or would not result in a "substantial" adverse effect on scenic resources or visual character considers the aesthetic resource value of the site and the MPWSP component's visual impact severity (e.g., the nature and duration of the impact). The approach to determining aesthetic resource value and visual impact severity is described above in Section 4.14.1, Introduction, Key Concepts, and Terminology. For example, a project component with a high impact severity that would be located on a site with a low aesthetic resource value would result in a less-than-significant impact with respect to scenic or visual character. In other words, new conspicuous structures or visual changes in areas with a low aesthetic resource value may not necessarily result in substantial adverse effects on visual resources.

The determination that a project component would result in a substantial adverse effect related to light and glare considers the ambient lighting conditions of the project area and the types and locations of receptors that could be adversely affected by project components emitting or reflecting light. Spill-over of light beyond project sites has the potential to create a visual nuisance or hazard, interfering with vision, sleep, privacy and general enjoyment of the natural nighttime condition. Similarly, glare is caused by sunlit or artificial light reflecting from finished surfaces, such as glass windows and other reflective materials, which can result in similar nuisance or hazard conditions. Reflective light, such as that reflected from dark or mirrored glass building materials, is more common in urbanized portions of the project area. Light sensitive receptors include motorists; people within residential areas; and, in some situations, natural areas. Substantial adverse effects related to lighting and glare would result if the project were to cause nighttime or reflective light to extend beyond the project limits and result in a visual nuisance or hazard for light-sensitive receptors. Effects related to lighting impacts on natural areas are discussed in Section 4.6, Terrestrial Biological Resources.

For this analysis, the proposed facility sites and representative portions of the proposed pipeline alignments were photographed and observed from public vantage points (see photos in **Figures 4.14-3a** and **4.14-3b**). These observation points are representative examples of publicly accessible viewpoints from which the MPWSP components would normally be seen, either temporarily (during construction) or permanently (as aboveground structures). Section 4.14.1, Introduction, Key Concepts, and Terminology, describes these locations in more detail. The potential physical changes resulting from the MPWSP components are described below.

4.14.6 Direct and Indirect Effects of the Proposed Project

Table 4.14-3 presents the potential impacts on aesthetic resources as well as significance determinations for each impact.

TABLE 4.14-3
SUMMARY OF IMPACTS – AESTHETIC RESOURCES

Impacts	Significance Determinations
Impact 4.14-1: Construction-related impacts on scenic resources (vistas, roadways, and designated scenic areas) or the visual character of the project area and its surroundings.	LS
Impact 4.14-2: Temporary sources of substantial light or glare during construction.	LSM
Impact 4.14-3: Permanent impacts on scenic resources (vistas, roadways, and designated scenic areas) or the visual character of the project area and its surroundings.	LSM
Impact 4.14-4: Permanent new sources of light or glare.	LSM
Impact 4.14-C: Cumulative impacts related to aesthetic resources.	LSM

NOTES:
LS = Less than Significant, no mitigation proposed
LSM = Less than Significant impact with Mitigation

4.14.6.1 Construction Impacts

Impact 4.14-1: Construction-related impacts on scenic resources (vistas, roadways, and designated scenic areas) or the visual character of the project area and its surroundings. (*Less than Significant*)

Project construction activities could result in temporary impacts on scenic resources and the visual character of the project area and vicinity. Construction sites, vehicles, equipment and materials, stockpiles, and exposed soils would be temporarily visible from multiple public vantage points. Staging areas would include vehicle and equipment storage in the vicinity of MPWSP sites, generally within existing paved areas, and would not involve ground disturbing, vegetation removal, or other types of activities that would substantially impact scenic resources or the visual character of the area. Potential impacts on scenic resources and visual character as a result of construction activities are described below.

Subsurface Slant Wells

Construction activities for the subsurface seawater intake system would take place on the coast of Monterey Bay, in the CEMEX active mining area in northern Marina. As noted previously, the site of the proposed slant wells has been visually disturbed due to sand mining activities. Portions of the site are devoid of vegetation, have modified topography, and have been developed with temporary and permanent facilities. Mining equipment regularly moves throughout the mining area on the site. However, because of its proximity to Highway 1 and the coast, the site is considered to have a moderate aesthetic resource value (see Section 4.14.2, Setting/Affected Environment, for additional discussion).

Construction of the remaining subsurface slant wells in the CEMEX active mining area would take approximately 15 months to complete, and could take place anytime throughout the overall 24-month construction duration for the proposed project (subject to limitations described in mitigation measures for terrestrial biological resources impacts, such as **Mitigation Measure 4.6-1d**). Due to the site's topography and vegetation, views of the work areas would be limited from locations outside the CEMEX property. Viewed from the east, the worksite would largely be screened from view by the intervening dunes and Monterey cypress trees along the site's eastern (landward) perimeter. Motorists traveling along Highway 1 at speeds of 60 miles per hour would have distant and fleeting views of the work. Views from the beach would be similarly obscured by the large sand dunes that exist between the beach and the proposed well sites; however, such views would be nearer and longer in duration.

Given the industrial nature of the site, with its varied topography, denuded areas, and existing mining operations, construction activities would not contrast with the site's existing setting. Nor would these activities appear dominant, relative to the site's features and existing equipment, facilities, and operations. While increased construction activity would temporarily detract from the naturalistic aesthetic of the coast as viewed by passersby, these activities would not impair public views of the coast. For these reasons, project construction would have a moderate visual impact severity.

Construction of the subsurface slant wells would not have a substantial adverse effect on scenic resources or visual character and the impact would be less than significant.

MPWSP Desalination Plant

The MPWSP Desalination Plant site is located amidst agricultural fields and industrial land uses. The site lies within the Urban and Built-up landscape unit and, as discussed in Section 4.14.2, Setting / Affected Environment, the site has a low aesthetic resource value. Project construction would not contrast with the surrounding setting or appear dominant relative to surrounding features or land uses. This is because similar land disturbing activities and large equipment usage are commonplace in the operations on adjacent agricultural lands and the industrial Monterey Regional Environmental Park, also known as the Monterey County Landfill. Project construction would not impair public views of valued aesthetic resources. There are no designated scenic roadways or scenic viewpoints from which the MPWSP Desalination Plant site or construction activities would be visible. Rows of eucalyptus and Monterey Cypress trees to the south and west of the site would largely screen construction activities from passersby on Charles Benson Road. Motorists on Highways 1 and 183 would not likely notice project construction, given the distance of more than a mile between these highways and the MPWSP Desalination Plant site, and considering its proximity to the adjacent industrial park. For these reasons, project construction would have low visual impact severity.

Construction of the MPWSP Desalination Plant would not have a substantial adverse effect on scenic resources or visual character and the impact would be less than significant.

Pipelines and Other Conveyance Facilities North of Reservation Road

Pipeline construction would involve use of heavy equipment, trenching, and other earthwork that could be visible to public viewing areas. Pipeline installation would occur primarily within roadways. Outside of these areas, pipeline construction would involve limited removal of mature vegetation, including landscaping and trees. These impacts would not occur in the vicinity of a designated scenic highway, nor would they be to a degree that resulted in substantial damage to or degradation of scenic resources or visual quality of the alignment area. The duration of construction would be brief, as pipeline installation would typically progress at a rate of 150 to 250 feet per day, for a total of approximately 4 to 6 months, depending on the pipeline segment. Upon completion of construction, the disturbed area would be returned to its approximate pre-construction condition. Therefore, impacts would be temporary.

Pipeline construction would not substantially degrade the aesthetic character or scenic vistas in the vicinity of the proposed pipeline alignments. For these reasons, the visual impact of pipeline installation would be less than significant. The following subsections describe the locations where temporary impacts would occur for each pipeline component.

Source Water Pipeline

Source Water Pipeline construction could be visible to motorists along Highway 1, an eligible state scenic highway. These activities could temporarily contrast with the surrounding environment, but would not dominate the landscape or have a permanent effect on coastal views. Views of construction activities by motorists along Highway 1 would primarily be distant and fleeting due to high vehicle speeds. As construction of the pipeline approaches and crosses beneath Highway 1, the potential would be greater for motorists to notice the construction activities. Construction activities would also be briefly visible to passing motorists and bicyclists on Del Monte Boulevard, Lapis Road and the Monterey Peninsula Recreational Trail. For these reasons, the impact severity of construction activities associated with the proposed Source Water Pipeline would be low.

New Desalinated Water Pipeline

Pipeline construction could be visible to motorists, cyclists, pedestrians, traveling along area roads, as well as from some residential areas in Marina. Views of construction activities by motorists and cyclists and pedestrians traveling along the Monterey Peninsula Recreational Trail would mostly be fleeting, as they would view the work while passing by or through the construction zone. Views of construction activity from residential areas in Marina and from Vince Dimaggio and Locke-Paddon Parks would be longer in duration. Construction activities would also be briefly visible to passing motorists and bicyclists on Del Monte Boulevard, Lapis Road, and the Monterey Peninsula Recreational Trail. These activities could temporarily contrast with the surrounding environment, but would not dominate the landscape or have a permanent effect on scenic views. For these reasons, the impact severity of construction activities associated with the new Desalinated Water Pipeline would be low.

Castroville Pipeline and Optional Alignment 2

Pipeline construction could be visible to motorists traveling along Monte Road, and possibly to motorists traveling along Highway 1. Views of construction activities by motorists would mostly be fleeting, as they would be in motion, traveling at speeds of 35 to 60 miles-per-hour. Given the degree of intensive agricultural activity along this alignment, the proposed pipeline construction activities would not contrast with the surrounding environment, nor would they dominate the landscape or have a permanent effect on scenic views. For these reasons, the visual impact severity of construction activities associated with the Castroville Pipeline would be low.

Castroville Pipeline Optional Alignment 1

The effects of the Castroville Pipeline Optional Alignment construction would be similar to those described for the proposed Castroville Pipeline alignment. Construction activities north of Nashua Road would be more prominently visible to motorists traveling along Highway 1. Similarly, within Castroville, the work would be visible to motorists, cyclists, and pedestrians traveling along Merritt Way and Merritt Street for longer durations. The overall effect would not be substantially different and the visual impact severity of construction activities would remain low.

Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond

The Brine Discharge Pipeline, Brine Mixing Box, and Pipeline to CSIP Pond would be constructed within or adjacent to the Grass and Rangeland, Urban and Built-up, and Agricultural landscape units, characterized by undeveloped grasslands and agricultural fields to the south and southwest and the Monterey Regional Environmental Park MRWPCA Treatment Plant to the north and east. Construction activities would be visible for short durations to motorists traveling along Charles Benson Road as well as from areas within the Monterey Regional Environmental Park and MRWPCA Regional Wastewater Treatment Plant. Because the aesthetic resource value is low and construction activities would be in keeping with the types of activities already occurring in this area, there would be no appreciable contrast with the surrounding setting, and the work would not appear dominant relative to other activities on adjacent properties. Consequently, the impact severity of construction activities for the Brine Discharge Pipeline, Brine Mixing Box, and the Pipeline to CSIP Pond would also be low.

Pipelines and Other Facilities South of Reservation Road

Improvements to ASR System

The ASR-5 and ASR-6 Wells and ASR Conveyance Pipelines would be constructed in an area of moderate aesthetic resource value. ASR-5 and ASR-6 Wells and ASR Conveyance Pipeline construction activities would be visible from General Jim Moore Boulevard and from nearby residences. Pipeline construction would proceed at a rate of approximately 150 to 250 feet per day and last 5 months; well construction would last 12 months. During this time, area residents, motorists, cyclists, and pedestrians traveling along General Jim Moore Boulevard would be exposed to views of construction activities of the type described for pipelines above, which would be conspicuous and would contrast with the aesthetic character of the surrounding landscape. Such views would be fleeting, as the viewers would be in motion. Given the width of the travel corridor, the expansive views it offers, and the height and mass of area structures and vegetation, the proposed work would not dominate the landscape, nor would it impair public views. For these reasons, the visual impact severity would be low. The visual impact of the ASR-5 and ASR-6 Wells and ASR Conveyance Pipeline installation would be less than significant.

Pipelines South of Reservation Road

Pipeline construction south of Reservation Road would involve the same types of activities and effects, and progress at the same general rate, as that described for pipelines north of Reservation Road. The effects would be temporary. Pipeline construction would not substantially degrade the aesthetic character or scenic vistas in the vicinity of the proposed pipeline alignment. For these reasons, the visual impact of pipeline installation would be less than significant. The following subsections describe the locations where temporary impacts would occur for each pipeline component.

The aesthetic resource value of pipeline alignment areas south of Reservation Road, which include lands within the Highway 1 and 68 scenic corridors, generally ranges from low to moderate, and most segments would be constructed within paved or disturbed roadway rights-of-way or utility easements. The aesthetic resources effects of the new Transmission Main (except the segment west of Highway 1, discussed below) and Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements construction activities, and those associated with their respective optional alignments, would be substantially similar to those described for the new Desalinated Water Pipeline.

A segment of the proposed new Transmission Main would be constructed within the TAMC right-of-way, west of Highway 1 and east of Fort Ord Dunes State Park. Construction activities along portions of this segment would be visible to motorists traveling along Highway 1 and cyclists and pedestrians traveling along the Monterey Peninsula Recreational Trail. Construction activities would contrast with the naturalistic setting of the Fort Ord Dunes State Park and coast to the west. The work would not appear dominant among the prominent dunes and state highway on either side of the alignment. Given the alignment's proximity to a proposed scenic corridor and established public viewpoints, the visual impact severity would be moderate.

Carmel Valley Pump Station

The Carmel Valley Pump Station would be located in an area of moderate aesthetic resource value, characterized by large-lot, low-density single-family residential development nestled between undulating hills covered in coastal scrub and oak woodlands to the north, and the wooded Carmel River corridor to the south. The pump station site, which is set back from Carmel Valley Road by about 250 feet, has been previously disturbed and is not plainly visible from any nearby public vantage points. For these reasons, the work would not contrast with the setting, dominate the landscape, or otherwise impair scenic views. The visual impact severity is considered low.

Proposed construction would not degrade the aesthetic character or scenic vistas in the vicinity of the Carmel Valley Pump Station site. For these reasons, Carmel Valley Pump Station installation would be expected to have a less than significant impact with respect to aesthetic resources.

Impact Conclusion

Construction equipment and machinery, spoils stockpiles, vegetation removal, and exposed earth associated with the implementation of many project components would be temporarily visible to motorists, bicyclists, pedestrians, and other observers such as nearby residents and park visitors. Some of these construction activities would be visible from Highways 1, 68, and 156, which are eligible for designation or officially designated as State Scenic Highways. These construction activities could disrupt the visual character of the surrounding areas. However, due to the temporary nature of these construction effects, and because work areas would be restored to their approximate pre-construction condition upon completion of construction, such impacts would be less than significant. Although mitigation is not required to reduce a significant impact under CEQA, this EIR/EIS recommends implementation of **Mitigation Measure 4.14-1 (Maintain Clean and Orderly Construction Sites)**.

Recommended Mitigation Measure

Although not required to reduce the above-described aesthetic resources impacts to a less-than-significant level, implementation of **Mitigation Measure 4.14-1 (Maintain Clean and Orderly Construction Sites)** is recommended for all construction sites to address temporary aesthetic resources impacts. The mitigation measure would require basic daily site maintenance (such as storing construction materials and equipment away from public view and removing construction debris promptly at regular intervals) and construction area screening where appropriate.

Mitigation Measure 4.14-1: Maintain Clean and Orderly Construction Sites.

As part of contract specifications, CalAm shall include a requirement that the construction contractor(s) keep staging and construction areas as clean and inconspicuous as practicable by storing construction materials and equipment at the proposed construction staging areas or in areas that are generally away from public view when not in use, and by removing construction debris promptly at regular intervals. If necessary, additional appropriate screening (e.g., temporary opaque fencing) shall be used at construction sites to buffer views of construction equipment and material, where the use of such screening materials would not further degrade the visual character or further obstruct views of scenic resources or vistas in the area. Screening is not required for pipeline construction areas.

Impact 4.14-2: Temporary sources of substantial light or glare during construction. (*Less than Significant with Mitigation*)

Nighttime construction activities would require temporary construction lighting, which could introduce substantial light into the project area. As discussed in Chapter 3, Description of the Proposed Project, Section 3.3, Construction, the majority of construction activities would occur during the daytime and would not cause light effects. However, extended work hours into the night could be necessary during construction of certain project components, including the subsurface slant wells along the coast, the proposed ASR injection/extraction wells (ASR-5 and ASR-6 Wells), and the MPWSP Desalination Plant. There would be no nighttime lighting at staging areas. Unless otherwise exempted, nighttime construction may be subject to local ordinances governing work hours. See Section 4.12, Noise and Vibration, for additional discussion.

Project construction would not require large amounts of reflective materials that would result in substantial adverse effects related to glare. Any reflective materials required for project construction would be incidental to the construction process, limited to work areas, and be temporary. Therefore, MPWSP construction would have a less-than-significant effect related to glare. The topic of glare is not addressed further in this section.

Subsurface Slant Wells

As discussed in Section 4.14.2.2, Landscape Units, the subsurface slant wells would be located in an area that is generally dark, with sources of nighttime lighting originating primarily from within the CEMEX sand mining facility and from vehicle headlights along Highway 1. Construction activities associated with the subsurface slant wells would be required to occur 24 hours a day and 7 days a week, for a total of 15 months (but could occur anytime over the 24-month overall construction period). Nighttime construction activities would involve the use of high output lamps, such as halogen, mercury vapor, or high-pressure sodium lamps, which would introduce a new substantial source of light into the area. The drilling sites would be approximately 1,900 feet seaward of Highway 1 and approximately 0.5 mile north of the nearest residences. Despite the distance and intervening vegetation and dune topography, increased lighting could adversely affect nighttime views of this mostly undeveloped stretch of coastline from the viewpoint of Highway 1 motorists and coastal Marina residents.

The impact from nighttime lighting associated with subsurface slant well construction would be potentially significant. **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)** requires CalAm to implement site-specific nighttime construction lighting measures, including the use of light shields, directing lights downward, and using the minimum wattage necessary. With implementation of these measures, the temporary light impacts associated with nighttime construction of subsurface slant wells would be reduced to less-than-significant levels.

MPWSP Desalination Plant

The MPWSP Desalination Plant would be constructed on a vacant parcel that currently does not contain substantial sources of light. Nearby sources of light include headlights from vehicles traveling along Charles Benson Road and nighttime security lighting in adjacent agricultural areas and at the adjacent industrial park. Construction activities and lighting requirements would be similar to those described above for the subsurface slant wells. The MPWSP Desalination Plant construction activities could occur for up to 24 hours a day, 7 days a week, for approximately 24 months, creating a new substantial source of temporary lighting. The only potentially affected receptors would be motorists traveling along Charles Benson Road at night. However, the site is screened from view along Charles Benson Road by a row of mature eucalyptus and Monterey Cypress trees. Beyond Charles Benson Road, the road nearest the site is Del Monte Boulevard, located more than 0.5 mile to the west. Two homes located 0.5 and 1 mile northwest of the plant site are located within view of the Dole and Budweiser processing facility, Highway 1, and Monte Road. The nighttime light from these sources would be more than that from nighttime construction of the MPWSP Desalination Plant. As a result, any nighttime lighting impacts on area motorists and area residents would be negligible.

The temporary lighting impacts associated with nighttime construction at the MPWSP Desalination Plant would be less than significant.

Pipelines North of Reservation Road with Nighttime Lighting

The pipelines and other conveyance facilities proposed for areas north of Reservation Road would be constructed in settings similar to those described above for the subsurface slant wells and the MPWSP Desalination Plant. These pipelines are the Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, and all related optional alignments. However, segments of the Castroville Pipeline and Castroville Pipeline Optional Alignment 1 would pass through a more densely developed area of Castroville, which has more diverse and intensive nighttime lighting than other portions of the project area north of Reservation Road. Pipeline construction may involve nighttime construction, which might be necessary to meet the MPWSP construction schedule. Pipelines and conveyance facilities north of Reservation Road that could require nighttime construction include the Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, and Castroville Pipeline, as well as any corresponding optional alignments. The Brine Mixing Box would not require nighttime construction. Nighttime construction activities would require the use of lighting similar to or the same as that required for the subsurface slant wells and MPWSP Desalination Plant. Such construction lighting would introduce substantial sources of light into areas that presently have little nighttime lighting. This light would affect nighttime views from and could temporarily affect nighttime motorists' vision along Highway 1, Highway 156 (for Castroville Pipeline Optional Alignment 1), Merritt Way (for Castroville Pipeline Optional Alignment 1), Merritt Street, Monte Road, Lapis Road, Charles Benson Road, and Del Monte Boulevard.

The impact from nighttime lighting associated with pipeline construction activities would be potentially significant. **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)** requires CalAm to implement site-specific nighttime construction lighting measures, including the use of light shields, directing lights downward, and using the minimum wattage necessary. With implementation of these measures, the temporary light impacts associated with nighttime construction of pipelines north of Reservation Road would be reduced to less-than-significant levels.

ASR-5 and ASR-6 Wells

The primary source of lighting in the vicinity of the proposed ASR-5 and ASR-6 Wells is street lighting along General Jim Moore Boulevard; however, other sources of light in the area include headlights from automobiles traveling along General Jim Moore Boulevard, golf course and institutional facilities, and residential development. Construction of the ASR-5 and ASR-6 Wells would normally occur during the daytime; however, continuous 24-hour construction would be necessary for up to 8 weeks during well completion and testing. Construction lighting would introduce a new substantial source of light to the area, which could adversely affect nighttime views in the area, including by impairing motorists' ability to see the road or oncoming traffic, or disrupting residents of the nearby Fitch Park Military Housing area (e.g., prevented them from sleeping).

The potential impacts from nighttime lighting associated with ASR injection/extraction wells construction activities would be potentially significant. **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)** requires implementation of site-specific construction lighting control measures, as described above. With these measures implemented, temporary nighttime construction lighting impacts would be reduced to a less-than-significant level.

ASR Conveyance Pipelines, Ryan Ranch- Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements

As noted previously, pipeline construction would typically take place during daytime hours although nighttime construction might be necessary along certain segments to meet the MPWSP construction schedule. This EIR/EIS assumes that construction of the ASR Conveyance Pipelines, Ryan Ranch- Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements would occur only during daytime hours. As a result, few, if any construction-related light impacts would result during installation of these facilities.

New Transmission Main

Nighttime construction may be necessary for certain segments of the new Transmission Main and its optional alignment. Ambient nighttime lighting varies throughout the project area south of Reservation Road. There is some existing nighttime lighting from overhead street lights, shopping centers, and other commercial uses along Marina's Del Monte Boulevard. Sources of nighttime lighting are more diverse, fewer, and more dispersed west of Highway 1 in Marina and Seaside, along General Jim Moore Boulevard; these areas tend to be the darkest within the planning area.

Nighttime construction lighting would introduce substantial sources of new light into areas that presently have little nighttime lighting and increase ambient nighttime lighting within other areas. This light would affect nighttime views and could temporarily affect nighttime motorists' vision along Highway 1 and other roadways along which nighttime pipeline construction would occur.

The impact related to temporary sources of light during construction of the new Transmission Main and its optional alignment is considered potentially significant. However, implementation of **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)**, which requires that CalAm implement site-specific nighttime construction lighting measures, including using light shields and directing lights downward, would reduce the impact to a less-than-significant level.

Carmel Valley Pump Station

The Carmel Valley Pump Station would be constructed during daylight hours. No impact related to lighting during construction would result.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.14.3, Regulatory Framework, MPWSP nighttime construction could conflict with applicable regulatory requirements related to aesthetic resources. Elements of the proposed MPWSP may be potentially inconsistent with provisions of the California Coastal Act and Seaside General Plan that were established for the purpose of avoiding or minimizing impacts on aesthetic resources. As discussed in the preceding paragraphs, **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)**, requires that CalAm implement site-specific nighttime construction lighting measures. With these measures implemented, the MPWSP would be consistent with the above-noted regulatory requirements.

Impact Conclusion

Project construction activities have the potential to introduce temporary sources of substantial light into the project area. This impact would be significant but mitigable for the subsurface slant wells and the ASR-5 and ASR-6 Wells, as well as for the Source Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, new Desalinated Water Pipeline, new Transmission Main, and their corresponding optional alignments. Implementation of **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)**, which requires site-specific construction lighting controls, would reduce the potential impacts of nighttime construction lighting to a less-than-significant level. No impacts related to nighttime lighting would result from construction of the ASR pipelines, Carmel Valley Pump Station, Ryan Ranch- Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

Mitigation Measures

Mitigation Measure 4.14-2 applies to all project components where nighttime construction is required, including the subsurface slant wells and the ASR-5 and ASR-6 Wells, as well as the Source Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, new Desalinated Water Pipeline, new Transmission Main, and their corresponding optional alignments.

Mitigation Measure 4.14-2: Site-Specific Nighttime Lighting Measures.

To prevent exterior lighting from affecting nighttime views, the design, construction, and operation of lighting at MPWSP facilities, shall adhere to the following requirements:

- Use of low-intensity street lighting and low-intensity exterior lighting shall be required.
- Lighting fixtures shall be cast downward and shielded to prevent light from spilling onto adjacent offsite uses.
- Lighting fixtures shall be designed and placed to minimize glare that could affect users of adjacent properties, buildings, and roadways.
- Fixtures and standards shall conform to state and local safety and illumination requirements.

CalAm shall ensure these measures are implemented at all times during nighttime construction and for the duration of all required nighttime construction activity.

4.14.6.2 Operational and Facility Siting Impacts

Impact 4.14-3: Permanent impacts on scenic resources (vistas, roadways, and designated scenic areas) or the visual character of the project area and its surroundings. (*Less than Significant with Mitigation*)

Permanent new aboveground facilities, if visible from public vantage points, could affect scenic resources or substantially degrade the existing character of the project area and its surroundings. This discussion of permanent new facilities is limited to aboveground project components. Once constructed, the proposed pipelines would be underground and thus would have no permanent impacts on scenic resources or the visual character of the area.

Subsurface Slant Wells

The new subsurface slant well sites would be located within a large depression in the interior of the CEMEX property, surrounded by dunes that rise in elevation from 10 to 50 feet above the base of the depression. The existing well site (WS-1) is also located in the interior of the property and surrounded by similar topography. As discussed in Section 4.14.2, Setting / Affected Environment, the proposed location of the subsurface slant wells has a moderate aesthetic resource value. Above-ground components associated with each of the six subsurface slant well sites include one 8-inch-tall concrete wellhead vault per slant well, 12-inch-tall concrete pump-to-waste vault, and an approximately 11-foot-tall fiberglass electrical control cabinet. At five of the subsurface slant well sites, the above-ground facilities would be constructed atop a concrete pad, ranging in size from 5,250 to 6,025 square feet.

The site's dune topography and vegetation would substantially limit views of the subsurface slant well sites from locations outside of the CEMEX property. From a distance of approximately 2,000 feet, the above-ground subsurface slant well facilities may be visible to motorists traveling along an approximately 0.5-mile segment of Highway 1. As motorists would be traveling at speeds of 60 miles per hour and focused on the road, rather than distant views to the west, potential views from this vantage point would be fleeting. Views from the beach would be similarly obscured by the intervening dune topography; although, such views would be nearer and longer in duration. Given their size relative to the surrounding dune topography and other structures on the site, the above-ground facilities would not appear dominant relative to surrounding features and would not obstruct coastal views. At the same time, the design, color, and texture of the surface of these facilities could make them more conspicuous or incompatible with the coastal setting. Incompatible surfacing could detract from the visual character of the area. For these reasons, the visual impact severity is considered moderate.

The impact of the subsurface slant wells on scenic coastal resources and visual character would be significant. **Mitigation Measure 4.14-3a (Facility Design)** requires that CalAm design the facilities to avoid or minimize contrast with the surrounding setting. With implementation of this measure, the aesthetic resources impacts would be reduced to a less-than-significant level.

MPWSP Desalination Plant

The MPWSP Desalination Plant would be constructed on the upper terrace (approximately 25 acres) of a 46-acre parcel, adjacent to the industrial Monterey Regional Environmental Park. As discussed in Section 4.14.2, Setting / Affected Environmental, the site is located in the Urban and Built-up landscape unit and has a low aesthetic resource value. As described more fully in Section 3.2.2, MPWSP Desalination Plant, structures proposed for the site would generally range in size from 6,000 to 30,000 square feet in area and rise to heights of up to 35 feet.

A row of mature eucalyptus and Monterey cypress trees along Charles Benson Road would screen or block views to the MPWSP Desalination Plant from the south and west (including from Highway 1), and the river terrace in this area would partially obstruct views of the MPWSP Desalination Plant from areas farther east. **Figure 4.14-4** shows the site of the proposed MPWSP Desalination Plant as viewed from Highway 1. As shown in the photograph, considering the distance to the Monterey Regional Environmental Park and its existing industrial character, the facilities proposed at the MPWSP Desalination Plant site would not be particularly discernible from Highway 1. As such, the MPWSP Desalination Plant facilities would not contrast with the

SOURCE: ESA, 2013

205335.01 Monterey Peninsula Water Supply Project

Figure 4.14-4
Existing Views of MPWSP Desalination Plant Site from Highway 1

surrounding setting. Similarly, the proposed facilities would not dominate the setting relative to surrounding features; developments in the adjacent Monterey Regional Environmental Park and MRWPCA Regional Wastewater Treatment Plant are of a similar size and scale. Given the site's low aesthetic resource value, absence of scenic resources, and limited visual accessibility, operation of the MPWSP Desalination Plant would not impair public views of aesthetic resources. For these reasons, the visual impact severity is considered low.

Operation of the MPWSP Desalination Plant would not have a substantial adverse effect on scenic resources or visual character and the impact would be less than significant.

ASR-5 and ASR-6 Wells

The proposed ASR-5 and ASR-6 Wells would be located immediately east of General Jim Moore Boulevard and south of Ardennes Circle in the Fitch Park military housing area. Along the tree-lined General Jim Moore Boulevard are single-family residences, a golf course, and a school. There are no scenic highways in the immediate vicinity. As discussed in Section 4.14.2, Setting / Affected Environmental, these facilities would be located in an area with moderate aesthetic resource value.

Permanent aboveground structures associated with the ASR-5 and ASR-6 Wells include pump houses and fencing. The pump and electrical control system for each well would be housed in an 11-foot-tall, 900-square-foot concrete pump house. A 9.5-foot-tall security fence would enclose the approximately 0.4- and 0.5-acre area around the ASR-5 and ASR-6 Wells, respectively.

These facilities would be noticeable from General Jim Moore Boulevard and nearby residences. The aboveground facilities would be small relative to existing structures and buildings in the area and would not block any views of scenic resources. As other ASR facilities and other utility infrastructure exists along General Jim Moore Boulevard, including the ASR Phase I project located 1 mile to the south, the proposed ASR wells would not be out of character with the surrounding area. However, depending upon the design and finish of the pump houses and fences, the ASR-5 and ASR-6 facilities could contrast with the surrounding residential setting. The visual impact severity of these ASR system improvements would, therefore, be moderate.

The presence of the MPWSP ASR-5 and ASR-6 Wells could have a substantial adverse effect on scenic resources or visual character, which would be significant. **Mitigation Measures 4.14-3a (Facility Design)** and **4.14-3b (Facility Screening)** require that CalAm design the facilities to avoid or minimize contrast with the surrounding setting and screen them from public view to the extent feasible. With implementation of this measure, the impact would be less than significant.

Carmel Valley Pump Station

The Carmel Valley Pump Station would be located in an area characterized by residential development, scrub-covered hills, and the wooded Carmel River corridor. The aesthetic resource value of the Carmel Valley Pump Station site is considered moderate. Above-ground facilities associated with the Carmel Valley Pump Station include a 500-square-foot, 11-foot-tall pump station enclosure. A separate 100-square-foot electrical control building would be constructed outside of the pump station building. The structures would be subordinate in size to structures on adjacent properties, most of which are more than 1,000 square feet in area. The pump station site, which is set back from Carmel Valley Road by about 250 feet, is not plainly visible from any nearby public vantage points due to intervening topography and vegetation. For these reasons, the Carmel Valley Pump Station would not contrast with the setting, dominate the landscape, or otherwise impair scenic views. The visual impact severity is considered low.

Operation of the Carmel Valley Pump Station would not have a substantial adverse effect on scenic resources or visual character and the impact would be less than significant.

All Pipelines

All proposed pipelines would be installed below ground and would not involve substantial removal of vegetation and or trees that would substantially damage scenic resources or degrade the visual quality of the alignment areas. Therefore, no permanent impact on visual resources would result.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.14.3, Regulatory Framework, MPWSP operations could conflict with applicable regulatory requirements related to aesthetic resources. Elements of the proposed MPWSP may be potentially inconsistent with provisions of the California Coastal Act, Marina General Plan and Local Coastal Program, and Seaside General Plan that were established for the purpose of avoiding or minimizing impacts on aesthetic resources. As discussed in the preceding paragraphs, **Mitigation Measures 4.14-3a (Facility Design)** and **4.14-3b (Facility Screening)** require that CalAm design the facilities to avoid or minimize contrast with the surrounding natural setting and screen these facilities from public view. With these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirements.

Impact Conclusion

Permanent aboveground facilities proposed for the MPWSP could have an adverse impact on scenic resources or the existing visual character of facility sites within the project area. This impact would be significant but mitigable for the subsurface slant wells, and ASR-5 and ASR-6 wells. This impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.14-3a (Facility Design)** and **4.14-3b (Facility Screening)**, which require that CalAm design the facilities to avoid or minimize contrast with the surrounding setting and ensure the facilities are screened from public views to the extent feasible. Although mitigation is not required for the MPWSP Desalination Plant, or the Carmel Valley Pump Station, this EIR/EIS recommends implementation of **Mitigation Measures 4.14-3a (Facility Design)** and **4.14-3b (Facility Screening)** for all above-ground project components to further reduce potential aesthetic resources effects and facilitate compatibility of project design with the natural and built environment. No operational impacts related to scenic resources and visual character would result from below-ground facilities, including proposed pipelines and optional alignments.

Mitigation Measures

Mitigation Measure 4.14-3a applies to the subsurface slant wells, and ASR-5 and ASR-6 wells; could also apply to other facilities, but not required to avoid a significant impact.

Mitigation Measure 4.14-3a: Facility Design.

CalAm shall avoid reflective exterior finishes and treat visible structures with earth-tone finishes to reduce contrast with the ground surface and increase compatibility with the visual setting. Primary structures shall be treated with complementary colors in the brown, tan, gray, or green color spectrum, or with other natural colors. Choose paint and exterior finishes to ensure that structures blend into the surrounding landscape.

Mitigation Measure 4.14-3b applies to the ASR-5 and ASR-6 wells; could also apply to other facilities, but not required to avoid a significant impact.

Mitigation Measure 4.14-3b: Facility Screening.

CalAm shall ensure that fencing is designed to be minimally intrusive and to complement the architectural character of the proposed facility and the community. Fencing design shall be coordinated with nearby landscaping and MPWSP facility design to ensure all project components blend with the surrounding community and/or natural setting. Native plants, trees, or shrubs shall be used whenever practicable to screen views of the proposed aboveground facilities. Facility screening shall be in keeping with the character of the site and setting, and walled perimeters shall be avoided in natural settings to minimize the dominance of structures.

Impact 4.14-4: Permanent new sources of light or glare. (*Less than Significant with Mitigation*)

New sources of light and glare emanating from or reflecting off of the proposed facilities could disrupt the lighting environment of the project area as viewed from public vantage points and adjacent lands. An area’s existing level of ambient light is a factor in determining project impacts, as the incremental effects of new lighting tends to be less pronounced in well-lit areas. This impact pertains to those project components that propose permanent exterior nighttime lighting. Project components that do not propose exterior lighting, including all pipelines, would not result in impacts with respect to introducing permanent sources of light or glare. None of the proposed facilities would have reflective finishes and so MPWSP operations would have no impact related to glare.

Subsurface Slant Wells

The subsurface slant wells and the electrical control building and electrical control panel for the wells would not require additional exterior lighting. Therefore, this project component would not cause impacts related to new sources of light.

MPWSP Desalination Plant

Lighting proposed at the MPWSP Desalination Plant site would be only that which is necessary for safety and security; it would be similar to existing light sources in the vicinity and would not be out of character with lighting at the adjacent industrial Monterey Regional Environmental Park and MRWPCA Regional Wastewater Treatment Plant. Existing trees would screen site security lighting from direct view along Charles Benson Road, and there are no residential properties in the area that would be affected by nighttime lighting at the site. As a result, increased nighttime lighting at the MPWSP Desalination Plant would have a less-than-significant impact with respect to adverse effects on nighttime views.

All Pipelines

Pipelines and other conveyance facilities would be located below ground and therefore would not cause or contribute to light impacts.

Improvements to ASR System

Nighttime lighting at the proposed ASR injection/extraction wells could be required for site safety and security purposes. If not properly contained, light spillover from these proposed fixtures could adversely affect motorists' ability to see the road at night or disturb nearby residents. These effects would be most apparent to motorists and residents along General Jim Moore Boulevard and Ardennes Circle.

The potential impacts from unconfined nighttime lighting associated with ASR injection/ extraction wells operation would be significant. However, with implementation of **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)**, the impact would be reduced to a less-than-significant level. The measure would reduce nighttime light impacts by requiring use of low-intensity lighting, and that lights be shielded or directed downward to prevent light spillage into adjoining areas.

Carmel Valley Pump Station

The Carmel Valley Pump Station would require minimal nighttime security lighting. The proposed site is located approximately 240 feet south of Carmel Valley Road. The area is dark at night and has few sources of nighttime lighting. While unlikely to affect area motorists due to intervening topography and vegetation, new sources of lighting at the Carmel Valley Pump Station site could disturb residents as near as 250 feet from the source.

The potential impacts from unconfined nighttime lighting associated with the Carmel Valley Pump Station would be significant. However, with implementation of **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)**, the impact would be reduced to a less-than-significant level.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.14.2, Regulatory Framework, MPWSP nighttime construction could conflict with applicable regulatory requirements related to aesthetic resources that were adopted for the purpose of avoiding or mitigating an environmental effect. Elements of the proposed MPWSP may be potentially inconsistent with provisions of the California Coastal Act and Seaside General Plan that were established for the purpose of avoiding or minimizing impacts on aesthetic resources. As discussed in the preceding paragraphs, **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)**, requires that CalAm implement site-specific nighttime lighting measures in facility design, construction, and operations. With these measures implemented, the MPWSP would be consistent with the above-noted regulatory requirements.

Impact Conclusion

Project operations would introduce permanent sources of substantial light into the project area. This impact would be significant but mitigable for the ASR injection/extraction wells, and the Carmel Valley Pump Station. Implementation of **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)**, which requires site-specific lighting controls, would reduce the potential impacts of nighttime operations lighting to a less-than-significant level. Although such mitigation is not required for the MPWSP Desalination Plant, this EIR/EIS recommends implementation of **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)** for all above-ground project components with permanent sources of nighttime lighting to further reduce potential light spillover and dark night skies impacts. No operational impacts related to nighttime lighting would result from below-ground facilities, including proposed pipelines and optional alignments.

Mitigation Measures

Mitigation Measure 4.14-2 applies to the ASR-5 and ASR-6 Wells and Carmel Valley Pump Station.

Mitigation Measure 4.14-2: Site-Specific Nighttime Lighting Measures.

(See Impact 4.14.2, above, for a description)

Recommended Mitigation Measures

Although not required, except to the extent discussed above, to reduce the above-described aesthetic resources impacts to a less-than-significant level; to the extent feasible, implementation **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)** is recommended for all above-ground project components with permanent sources of nighttime lighting, including the MPWSP Desalination Plant.

Mitigation Measure 4.14-2 applies to the MPWSP Desalination Plant

(See Impact 4.14.2, above, for a description)

4.14.7 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects.

Impact 4.14-C: Cumulative impacts related to aesthetic resources. (*Less than significant with mitigation*)

The geographic scope of potential cumulative impacts on aesthetic resources encompasses the locations from which a viewer could see the MPWSP construction or operations elements along with views of other projects in the cumulative scenario. The timeframe during which the MPWSP could contribute to cumulative aesthetic resources effects includes the 24-month construction phase, as well as the anticipated approximately 40-year operations phase. A significant cumulative effect on aesthetic resources would result if the effects of the MPWSP combined in space and time with those of cumulative projects to cause substantial degradation of the same scenic resources. A significant cumulative effect related to light and glare would result if the effects of the MPWSP combined in space and time with those of other cumulative projects to cause substantial nuisance or hazard conditions on the same light-sensitive receptor.

Cumulative Construction Impacts

As discussed in Impact 4.14-1, the MPWSP construction activities would have temporary adverse visual impacts (e.g., presence of construction vehicles, staging of materials, and exposure of soils). However, given their temporary nature and that these areas would be restored to their approximate pre-construction condition following construction, such impacts would not be expected to have a significant impact with respect to aesthetic resources. Projects described in Table 4.1-2 whose effects could combine with those of proposed project construction to have an adverse effect on scenic resources include Fort Ord Dunes State Park Campground (No. 46), the Castroville Bicycle and Pedestrian Overcrossing (No. 36), the Beach Junction Structure Project (No. 61), and the CEMEX Removal Plan and Reclamation Plan (No. 63). The remaining cumulative projects in proximity to the MPWSP and with construction schedules that could result in the types of effects described above either are not proposed for scenic areas or would not be visible from the MPWSP (or scenic resources affected by the MPWSP) due to topography or other visual obstruction.

Each project is situated along a scenic corridor, but also within near-highway areas and proximate to existing development. Construction of these projects would involve aesthetic resource impacts similar to those described for MPWSP construction in Impact 4.14-1. Such impacts would be visible mainly to motorists traveling along Highway 1 in Seaside, Highway 156 and Merritt Way in Castroville, and Highway 1 in Marina. Implementation of these projects concurrent with or sequential to the new Transmission Main, Castroville Pipeline Optional Alignment 1, or subsurface slant wells, would extend the duration of time passersby are exposed to these impacts. However, as motorists would be traveling at high rates of speed, and likely focused on the road, such views would be fleeting. The overall duration of the visual disturbance would be temporary, limited to the construction phases of these projects. For these reasons, the impact severity would not be substantially different from that described previously for individual pipeline construction. For these reasons, the effects of MPWSP construction would not combine with those of cumulative projects to cause a significant cumulative effect with respect to aesthetic resources (*less than significant*).

As analyzed in Impact 4.14-2, proposed project construction would have a less-than-significant impact related to glare, and potential glare would be minimal and site-specific and thus would not contribute to a cumulative aesthetic impact. However, construction could result in a significant nighttime lighting impact associated with nighttime construction of the subsurface slant wells, Source Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, Castroville Pipeline, and ASR-5 and ASR-6 wells. The Beach Junction Structure Project identified in **Table 4.1-2** (No. 61) may require temporary nighttime construction lighting on the beach seaward of the slant well construction area, and may result in nighttime lighting impacts that would overlap with or occur in sequence with the proposed project's nighttime lighting at the slant well construction area. If overlap did occur, the combined effects could exceed the established thresholds of significance, resulting in a significant cumulative impact. However, following implementation of **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)**, the proposed project would have a less-than-significant impact related to nighttime construction lighting, and its contribution to any cumulative impacts would be reduced to a level that is less than significant because this measure would ensure that nighttime lighting has minimal spillover from active construction sites.

Cumulative Operations Impacts

As analyzed relative to Impact 4.14-3, the MPWSP Desalination Plant, ASR-5 and ASR-6 wells, and the Carmel Valley Pump Station would have a less-than-significant effect related to scenic resources and visual character. The subsurface slant wells, as viewed from Highway 1, could result in significant impacts on scenic resources and visual character. However, these components would not cause or contribute to a significant cumulative impact on scenic resources or visual character, because none of the projects identified in **Table 4.1-2** is proposed for a location that would be visible from an above-ground MWPSP component and have an adverse effect on the same scenic resource. Consequently, the combined operations-related effects of the MPWSP and cumulative projects identified in **Table 4.1-2** would result in a less than significant cumulative effect with respect to scenic resources and visual character.

As analyzed in Impact 4.14-4, proposed project operation would have no impact related to glare. The effects of the MPWSP Desalination Plant's operational nighttime lighting would be less than significant. The proposed ASR-5 and ASR-6 Wells and the Carmel Valley Pump Station would each require nighttime security lighting that could have substantial adverse effects on nearby receptors. However, no projects identified in **Table 4.1-2** are proposed for areas that would be affected by MPWSP nighttime security lighting. Consequently, the combined operations-related effects of the MPWSP and cumulative projects identified in **Table 4.1-2** would result in a less than significant cumulative effect with respect to permanent sources of light and glare.

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4.15 Cultural and Paleontological Resources

As a result of comments received on the January 2017 Draft EIR/EIS, revisions have been made to this EIR/EIS section. Those changes include:

- *Revisions to Mitigation Measure 4.15-2b to reference compliance actions in accordance with the National Historic Preservation Act and 36 CFR Section 800, and;*
- *Revisions to Mitigation Measure 4.15-4 to reference compliance actions in accordance with the Native American Graves Protection and Repatriation Act, Section 3.*

4.15.1 Introduction

This section discusses the potential for the various components of the Monterey Peninsula Water Supply Project (MPWSP or proposed project) to affect previously identified and/or inadvertently discovered cultural and paleontological resources. Cultural resources include architectural resources, archaeological resources, traditional cultural properties, and human remains. Paleontological resources include fossilized remains of vertebrate and invertebrate organisms, fossil tracks, and plant fossils.

Based on CEQA Guidelines Section 15064.5(a), historical resources include, but are not limited to, any object, building, structure, site, area, place, record, or manuscript that is historically or archaeologically significant or that is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. Generally, a lead agency considers a resource to be "historically significant" if the resource meets the criteria for listing in the California Register of Historical Resources (California Register) (Public Resources Code [PRC] 5024.1).

Under the National Historic Preservation Act (54 U.S.C. § 300301 et seq.) implementing regulations, historic properties are defined as any prehistoric or historic-era district, site, building, structure, or object included on, or eligible for inclusion on, the National Register of Historic Places (National Register), including artifacts, records, and material remains relating to the district, site, building, structure, or object. (54 U.S.C. § 300308). Unless the property possesses exceptional significance, it must be at least 50 years old to be eligible for National Register listing

(NPS, 1990). Historic properties that meet federal criteria are also considered historical resources under CEQA, in accordance with PRC Section 5024.1(d)(1). Historical resources and historic properties refer to significant architectural/structural resources, significant archaeological resources (including maritime resources such as shipwrecks), and traditional cultural properties.

4.15.1.1 Definitions

Cultural Resources

Architectural/Structural Resources

Architectural/structural resources are typically elements of the built environment, including but not limited to buildings, structures, objects, sites, and districts; these resources range from single-family residences, stores, schools, and factories to downtown commercial districts, ranches, military bases, roads, railroads, bridges, tunnels, gardens, and statues. The term "structure" is used to create distinction between infrastructure and facilities, such as roads, railroads, trails, bridges, dams, canals, ditches, and retaining walls, and buildings made for purposes other than human shelter such as barns, sheds, or workshops. A structure that has lost its historical configuration or pattern of organization through deterioration or demolition (e.g., bridge footings, foundations) is usually considered a ruin and categorized as an archaeological site.

Archaeological Resources and Traditional Cultural Properties

An archaeological site is defined as "the location of a significant event, a prehistoric or historic-era occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possesses historic, cultural, or archaeological value regardless of the value of any existing structure" (NPS, 1990). Prehistoric archaeological materials might include obsidian and chert flaked stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools such as hammerstones and pitted stones. Historic-era materials might include stone, concrete, adobe, or wooden footings, foundations, and walls; artifact-filled wells or privies, and sheet refuse; or deposits of metal, glass, and/or ceramic refuse. Shipwrecks and other maritime related resources such as remnant wharfs and piers can be considered archaeological resources. Faunal and floral remnants can be associated with both prehistoric and historic-era sites. Human remains can be associated with archaeological sites or found in an isolated context.

A Traditional Cultural Property (TCP) is a property that is eligible for inclusion in the National Register based on its associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community. The cultural significance of a TCP is derived from the role the property plays in a community's historically rooted beliefs, customs, and practices.

Paleontological Resources

Paleontological resources are the fossilized remains of plants and animals, including vertebrates (animals with backbones), invertebrates (e.g., starfish, clams, snails, and marine coral), and fossils of microscopic plants and animals (microfossils). The age and abundance of fossils depend on the location, topographic setting, and particular geologic formation in which they are found. Fossil discoveries not only provide a historical record of past plant and animal life but can assist geologists in dating rock formations. In addition, fossil discoveries can expand our understanding of the time periods and geographic ranges of existing and extinct flora or fauna.

4.15.1.2 Area of Potential Effects

The Area of Potential Effects (APE) is the study area for architectural/structural, archaeological, and paleontological resources and is the area that could be affected by the proposed project. This analysis relies on the federal definition of APE, which is "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR 800.16(b)). The proposed project is equivalent to the federal undertaking (36 CFR 800.16(y), defining "undertaking" as a "project, activity program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including . . . "those requiring a Federal permit, license or approval.").

Direct APE (Archaeological/Paleontological APE)

The *direct* APE (also the archaeological and paleontological APE) is identical to the lateral extent of the project area boundary (see **Figures 3-2** through **3-14** in Chapter 3, Description of the Proposed Project). Like the project area boundary, the direct APE represents all areas where construction-related ground disturbance could occur, including open excavations, construction work areas, and staging areas. Not all portions of the direct APE (project area boundary) would necessarily be disturbed. The horizontal direct APE for nonlinear facilities (i.e., the MPWSP Desalination Plant, subsurface slant wells, ASR-5 and ASR-6 Wells, and Carmel Valley Pump Station) is based on the anticipated footprint and construction-related disturbance associated with each facility.

The standard width of the direct APE for pipelines proposed in undeveloped areas is approximately 100 feet; for pipelines proposed within existing roadways, the width of the direct APE is equal to the width of the road right-of-way (typically 30 to 100 feet from curb to curb). Pipeline trenches would generally be no more than 6 feet wide, except in areas with sandy soils and where there are no constraints to excavating a wider trench (i.e., known resources, geography, existing utilities, or other facilities that restrict the construction area). In these areas, a trench width of up to 10 or 15 feet could potentially be used to reduce costs related to shoring the trench. For all pipelines, the length of the direct APE is equal to the length of the proposed pipeline.

The depth of the direct APE varies for each of the project components. Pipeline depths would average 8 feet below the ground surface, with deeper excavations required where pipelines would be installed via trenchless technologies (i.e. jack and bore, horizontal directional drilling, etc.). The maximum construction area for the Desalination Plant would be the 25-acre development area. Depth of ground disturbance for the facilities would not exceed 12 feet below ground surface. The slant wells would be approximately 900 to 1,000 feet long and drilled at approximately 14 degrees below horizontal to extend up to 356 feet seaward of the MHW line (except #8, which would not extend past the MHW line) and to a depth of 190 to 210 feet beneath the sea floor. The direct APE for the subsurface slant wells includes an area within MBNMS.

Indirect APE (Architectural/Structural APE)

The *indirect* APE (also the architectural and structural APE) encompasses the direct APE as well as the area of indirect impact, which for historic architectural resources includes the viewshed or setting visible from a project component as well as the area subject to construction-related vibration.

The horizontal extent of the indirect APE is inclusive of any areas that could be subject to significant vibration effects from construction equipment. For project pipelines that are proposed in roadways, the indirect APE encompasses the width of the road right-of-way (typically 50 to 75 feet from curb to curb) as well as buildings and structures within 45 feet of the outside curb. The indirect APE for the subsurface slant wells and the ASR-5 and ASR-6 Wells encompass a 25-foot radius from the point of insertion (i.e., from the locations where the drill rigs would be operated). For project components in unpaved areas, the indirect APE is 45 feet from the centerline of the pipeline or a 45-foot buffer from a project component. For pipeline installations that would require trenchless construction techniques employing installation of sheet piles, the indirect APE is 85 feet from the jacking or receiving pit.

With respect to project effects on the viewshed or setting visible from a project component, the majority of the project components would be constructed below ground (i.e., pipelines) and would not affect the viewshed or setting associated with potential historical resources. For aboveground components, the viewshed and/or setting visible from a project component is included in the indirect APE. Section 4.14, Aesthetic Resources, further addresses the potential aesthetic and visual quality impacts associated with implementation of the proposed project.

4.15.2 Setting / Affected Environment

The study area for evaluation of cultural and paleontological resources impacts is the area of direct and indirect impact for the proposed project as described above in Section 4.15.1.2 Area of Potential Effects.

4.15.2.1 Cultural Setting

This section presents a brief overview of the environmental, geological, ethnographic, and historical background of the project vicinity. The project area extends across portions of unincorporated Monterey County and the cities of Marina, Seaside, Sand City, and Monterey. This section has been partially adapted from Jones and Holson (2009).

Natural Environment

The Monterey Bay area is bounded on the north by the Santa Cruz Mountains and on the south by the Gabilan and Santa Lucia Mountains. There are extensive alluvial plains in the southern half of the area between the coast and the mountains. A great submarine canyon extends from Moss Landing into the Pacific Ocean (Gordon, 1996).

The Monterey Bay area has two seasons—a cooler, wetter winter season and a warmer, drier summer season. Average annual rainfall in this area ranges from 15 to 27 inches, increasing with elevation. This area is temperate, with weather conditions varying from cloudy and rainy to clear and fair.

The Monterey Bay area is home to a vast array of floral and faunal species that would have been utilized by both prehistoric and early historic-period populations. Mayer and Laudenslayer (1988) describe the two dominant habitats in the Monterey Bay area as coastal oak woodland and coniferous montane hardwood. Native to coastal oak woodland is the coast live oak tree. During the Mission Period (1769–1834), early settlers in the area affected the integrity of this habitat through the introduction of agriculture and animal husbandry; in addition, the importation of aggressive annual species hindered the development of young oaks. As a result, portions of the woodland have become open woodlands or savannas. Over 60 species of mammals and over 110 species of birds—including California quail, deer, and squirrel—live in the coastal oak woodland habitat. A variety of tree species are found in coniferous montane hardwood habitat, including coast live oak, big-leaf maple, Pacific madrone, tan oak, canyon live oak, Coulter pine, and coastal redwood. Animals found in the coniferous montane hardwood habitat include California quail, plain titmouse, scrub jay, rufous-sided towhee, Bewicks wren, bush tit, and acorn woodpecker, among others.

Geological Context

The California coast has undergone dramatic landscape changes since humans began to inhabit the region more than 10,000 years ago. Rising sea levels and increased sedimentation into streams and rivers are among the changes (Helley et al., 1979). In many places, the interface between older land surfaces and Holocene-age landforms are marked by a well-developed buried soil profile (or “paleosol”). Paleosols preserve the composition and character of the earth’s surface prior to subsequent sediment deposition; thus, paleosols have the potential to preserve archaeological resources if the area was occupied or settled by humans (Meyer and Rosenthal, 2007). Because human populations have grown since the arrival of the area’s first inhabitants, younger paleosols (late Holocene) are more likely to yield archaeological resources than older paleosols (early Holocene or Pleistocene).

The direct APE intersects several geologic deposits, including artificial fill, Holocene-age dune sand, Holocene-age alluvial deposits, older Pleistocene-age marine terrace deposits, and bedrock (**Figure 4.15-1**). A geoarchaeological assessment completed for the Transportation Agency for Monterey County’s (TAMC) Light Rail Transit Project indicated that portions of the direct APE have a high sensitivity for buried archaeological resources (Meyer in Ruby, 2010). According to Meyer’s assessment (Meyer in Ruby, 2010:29), the potential for buried archaeological resources can be determined based on three assumptions:

- Archaeological sites tend to be located near perennial water sources;
- Archaeological deposits from successive time periods are more common because the density of human populations increased over time; and
- The longer a landform remained at the surface, the greater the probability that any one spot on that landform was occupied.

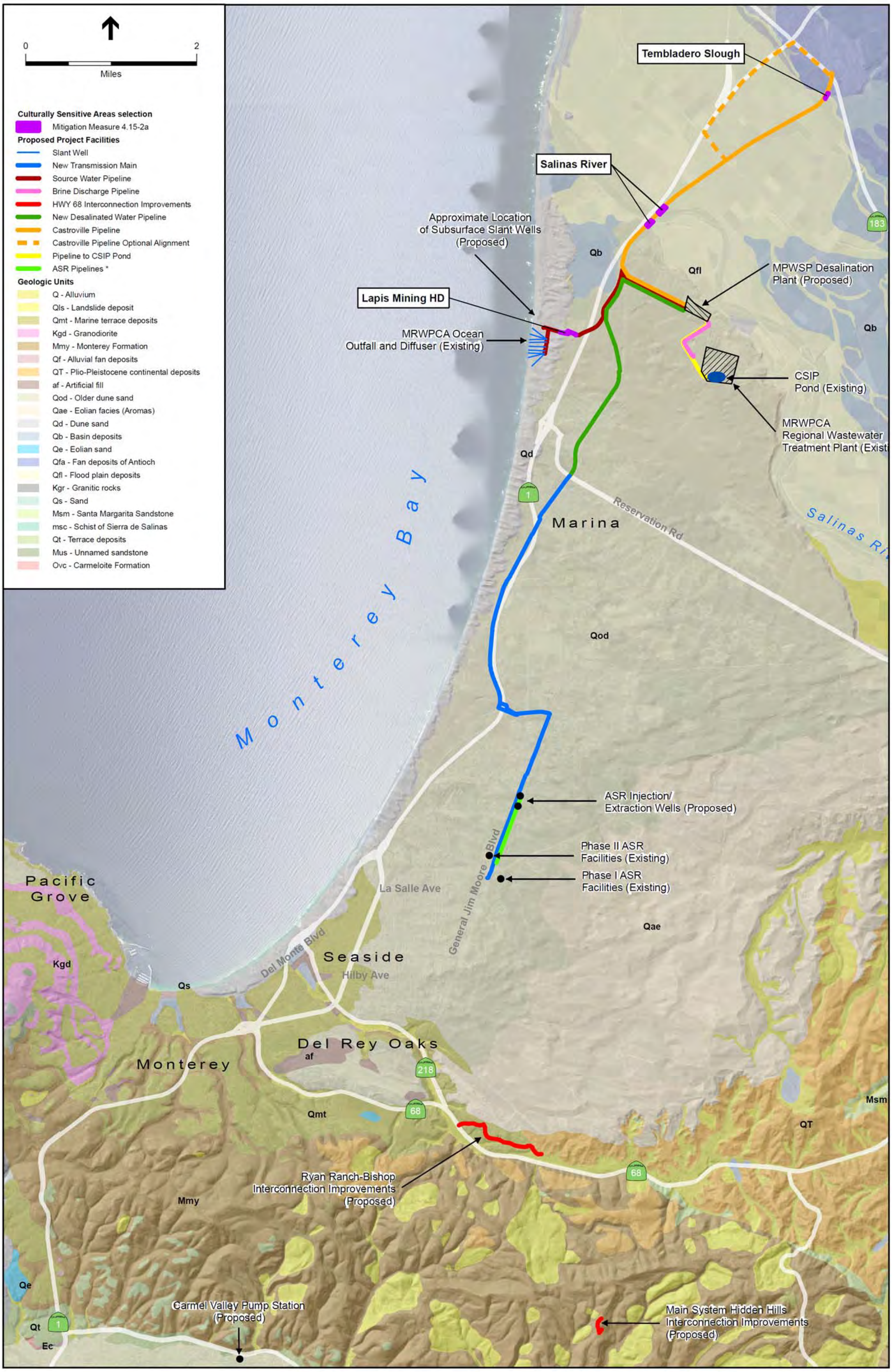
The Monterey Bay area locations determined to have the highest potential for buried archaeological sites are associated with channels or estuaries (Meyer in Ruby, 2010) that traverse the direct APE. This includes Tembladero Slough and Salinas River.

Based on the above-described geoarchaeological assessment, there is potential for deeply buried, well-developed soil horizons to be present in portions of the direct APE, and thus potential for archaeological resources associated with those buried soils to be encountered during project work. Those locations include Tembladero Slough near Castroville and the Salinas River (see **Figure 4.15-1**). It is not recommended that additional subsurface investigations for deeply buried sites be conducted for the proposed project for the following reasons: few deeply buried sites have been previously discovered in the Monterey Bay vicinity, ground disturbance in the direct APE at locations with a high archaeological sensitivity would be relatively narrow (generally 6 feet wide) and linear (rather than areal); and the active coastal dune environment may have destroyed, disturbed, and/or removed archaeological materials.

Prehistoric Context

Archaeologists have developed individual cultural chronological sequences tailored to the archaeology and material culture of each subregion of California. Each of these sequences is based principally on the presence of distinctive cultural traits and stratigraphic separation of deposits. Jones et al. (2007) provide a framework for the interpretation of the Central Coast and the Monterey Bay Area. The authors divide human history on the Central Coast into six broad periods: the *Paleo-Indian Period* (pre-8000 B.C.), the *Early Archaic Period* (8000 to 3500 B.C.), the *Early Period* (3500 to 600 B.C.), the *Middle Period* (600 B.C. to A.D. 1000), the *Middle/Late Transition Period* (1000 to 1250 A.D.), and the *Late Period* (A.D. 1250–1769). The periods have been largely defined on the basis of distinctive bead types; typological analysis and radiocarbon dating of *Olivella* beads show the bead sequence in the Monterey Bay Area as generally similar to those of the California Central Valley and the Santa Barbara coast. Economic patterns, stylistic aspects, and regional phases further subdivide cultural periods into shorter phases. This scheme uses economic and technological types, socio-politics, trade networks, population density, and variations of artifact types to differentiate between cultural periods.

Evidence of human habitation during the *Paleo-Indian Period*, characterized by big-game hunters occupying broad geographic areas, has not yet been discovered in the Monterey Bay Area. The oldest known occupation of the Monterey Bay area dates from ca. 5000 B.C., however data representing this earliest occupation is limited. The *Early Archaic Period* is represented by the *Millingstone Culture* (800 to 3500 B.C.) and is marked by large numbers of handstones and/or millingslabs, crude core and cobble-core tools, and less abundant flake tools and large side-notched projectile points. Millingstone components have been identified at locations in Monterey County near Elkhorn Slough and Monterey Peninsula. Faunal remains indicate that Millingstone people exploited shellfish, fish, birds, and mammals, and with a majority of Millingstone sites less than 25 kilometers from the shoreline there appears to have been a focus on shellfish consumption.



205335.01 Monterey Peninsula Water Supply Project

Figure 4.15-1
Culturally Sensitive Areas

NOTE:
*Refer to figure 4.2-2 for "A" geologic cross-section information and 4.2-3 for "B" geologic cross-section information.

SOURCE: CGS, 2002

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The *Early* and *Middle Periods* are represented by the *Hunting Culture* (3500 B.C. to A.D. 1250), which was marked by large quantities of stemmed and notched projectile points. During the *Early Period* (3500 to 600 B.C.), the first cut shell beads and the mortar and pestle are documented in burials, indicating the beginning of a shift from mobility to sedentism. During the *Middle Period*, (600 B.C. to A.D. 1000), geographic mobility may have continued, although groups began to establish longer-term base camps in localities from which a more diverse range of resources could be exploited. The first rich black middens are recorded from this period. The addition of milling tools, obsidian and chert concave-base projectile points, and the occurrence of sites in a wider range of environments suggest that the economic base was more diverse and required logistical hunting techniques. Coastal habitation was still preferred but large Hunting Culture middens have also been identified in inland valleys.

The *Late Period* (A.D. 1250–1769) is distinguished from the Hunting Culture by large amounts of Desert side-notched and Cottonwood arrow points, small bifacial bead drills, bedrock mortars, hopper mortars, distinct *Olivella* bead types, and steatite disk beads. These assemblages represent social complexity developed toward lifeways of large, central villages with resident political leaders and specialized activity sites. This differs dramatically from the Hunting Culture materials and may represent developments associated with population increase, environmental changes, and ethnic migrations.

Ethnographic Setting

Based on a compilation of ethnographic, historic, and archaeological data, Milliken et al. (2009) describes a group known as the Ohlone, who once occupied the general vicinity of the project area. While traditional anthropological literature portrayed the Ohlone peoples as having a static culture, today it is better understood that many variations of culture and ideology existed within and between villages. While these "static" descriptions of separations between native cultures of California make it an easier task for ethnographers to describe past behaviors, this masks Native adaptability and self-identity. California's Native Americans never saw themselves as members of larger "cultural groups," as described by anthropologists. Instead, they saw themselves as members of specific villages, perhaps related to others by marriage or kinship ties, but viewing the village as the primary identifier of their origins.

Levy (1978) describes the language group spoken by the Ohlone, known as "Costanoan." This term is originally derived from a Spanish word designating the coastal peoples of Central California. Today Costanoan is used as a linguistic term that references to a larger language family spoken by distinct sociopolitical groups that spoke at least eight languages (as different as Spanish is from French) of the same Penutian language group. The Ohlone once occupied a large territory from San Francisco Bay in the north to the Big Sur and Salinas Rivers in the south. The proposed project is in the greater Rumsen-speaking tribal area; their territory extended from Point Sur northward to the lower Pajaro River, and included the present-day cities of Monterey, Seaside, Marina, and Carmel. Dialects of the Rumsen language were spoken by four independent local tribes, including *Rumsen* in Monterey, *Ensen* of the Salinas vicinity, *Calenda Ruc* of the central shoreline of Monterey Bay, and *Sargentaruc* of the Big Sur Coast. Five villages were present in their territory at the time of Spanish contact: *Achasta*, *Tucutnut*, *Soccorronda*, *Echilat* and *Ichxenta* (Milliken et al., 2009).

Economically, Ohlone engaged in hunting and gathering. Their territory encompassed both coastal and open valley environments that contained a wide variety of resources, including grass seeds, acorns, bulbs and tubers, bear, deer, elk, antelope, a variety of bird species, and rabbit and other small mammals. The Ohlone acknowledged private ownership of goods and songs, and village ownership of rights to land and/or natural resources; they appear to have aggressively protected their village territories, requiring monetary payment for access rights in the form of clamshell beads, and even shooting trespassers if caught. After European contact, Ohlone society was severely disrupted by missionization, disease, and displacement. Today, the Ohlone, while not federally recognized, still have a strong presence in the Monterey Bay Area, and are highly interested in their historic and prehistoric past.

Historic-Era Background

This brief history of Monterey County was adapted from *Historic Spots in California* (Hoover et al., 2002) and supplemented by Breschini et al. (1983). The following discussion summarizes the major events of the post-contact period in the project vicinity.

Spanish Period

Although the first Spanish incursions into the Monterey area began in the early 17th century (with the 1602 Vizcaino expedition), it was not until over a century later that the Spanish government took an active interest in colonizing the territory then known as Alta California. Captain Gaspar de Portola led a land expedition to Monterey by way of the coast in 1769 (Hoover et al., 2002). The first Spanish exploration of the Salinas Valley followed in 1774, when Don Juan Bautista de Anza’s expedition established a route through the valley to Monterey. This route was known as El Camino Real, the Royal Road.

The mission system was an important institution in the colonization process of Alta California, the purpose of which was to Christianize the native people and turn them into tax-paying, Spanish-speaking colonists. The methods practiced by the Franciscan friars emphasized Hispanic modes at the expense of the traditional culture. The Spanish established 21 missions along El Camino Real, from San Diego to Sonoma, as well as presidios and pueblos. In the Monterey Bay area, Spanish authorities founded a presidio and mission in 1790 (further discussion below, in regional history). Other nearby Missions and pueblos also affected the native population of Monterey County, and established a new immigrant population.

Life for the new converts was (at best) difficult under the mission system. Converts were given European names and pressured to take up a sedentary way of life. Instead of relying on traditional skills such as fishing and gathering, converts were taught agricultural and pastoral techniques to produce supplies for the mission. Although the native population never completely abandoned their traditional lifeways, the social structure was severely disrupted. Many Native Americans died from European diseases to which they had no resistance, as well through abuse, violence, neglect, and military incursions. In contrast, the new colonial population prospered and grew, as did the animal populations and agricultural products that they brought with them.

Mexican Period

Spanish control of California ended with Mexican independence in 1821. In 1834, the Mexican government secularized the missions, freeing the Native Americans from the control of the missionaries. Returning to their traditional way of life was difficult, however, since land holdings were given to Mexican settlers ("Californios") rather than reverting to original ownership. A few Native Americans were granted land, but records show that, for the most part, the indigenous people quickly lost ownership through land claims disputes and sales. Native people became increasingly marginalized as a result of decreasing population, the stresses of mission life, and the erosion of traditional knowledge. Some Native Americans returned to their villages and resumed their traditional economy, replacing bows and arrows with guns. Others found jobs as vaqueros, or cowboys, on the ranchos operated by Mexican settlers. Census records show the number of Native Americans declined steadily into the 20th century.

In Monterey County, 76 land grants were made to Mexican settlers, more than in any other county (Beck and Haase, 1980). The lands adjacent to the Salinas River were highly valued and accounted for approximately one-half of the total land grants made in Monterey County. Some grantees used their land to establish ranches with enormous, free-ranging herds of horses and Spanish cattle. Cattle powered the Californio economy; cattle hides and tallow were the medium of exchange in business transactions among the Californios and with many trading ships that came from the American east coast.

By 1846, the population of Alta California was comprised of an estimated 8,000 settlers and 10,000 indigenous people (Breschini and Haversat, 1983). This figure represents a drastic decline in the Native American population from the estimated 133,500 in 1770. During Mexican control of Alta California, several hundred Americans settled; some of the Americans became citizens of Alta California by marrying into Mexican families and received land grants.

American Period

The 1848 Treaty of Guadalupe Hidalgo brought Alta California under the control of the United States. News of the Gold Rush that same year sparked a huge migration into California. With the rapid influx of settlers came legal disputes over the ownership of lands awarded by Spanish or Mexican authorities. The new American government passed the Land Act of 1851, which placed the burden of proof-of-ownership on the grantees; as a result, the few Native Americans who had received grants lost their titles, as did many of the Hispanic owners. By congressional action, grant claims were heard by a board of land commissioners and then appealed in federal courts. The outcome of the litigation was that federal officials ultimately recognized approximately 75 percent of the Mexican land grants; however, the majority of the petitioners had already sold off most of their holdings (Hoover et al., 2002:xvi).

Farming during the American period was characterized by three types of pursuits: cattle and sheep ranching, grain farming, and irrigated agriculture. Cattle and sheep ranching dominated until the 1880s. During this time, free-ranging, comparatively wild Spanish cattle were replaced by American breeds of livestock and dairy cows. Fencing with wooden posts and barbed wire became a prominent feature across the landscape. During the 1880s, Monterey County was California's third-ranking producer of livestock (Hoover et al., 2002). The development of railroads, including the Southern Pacific and regional lines such as the Monterey and Salinas Valley Railroad and the Pajaro Valley Consolidated Railroad, allowed for distribution and improved marketing for the central coast region. By 1901, the coast route was open and running between San Francisco and Los Angeles. Agriculture became more intensive as farming shifted to wheat and barley cultivation. Early crops included sugar beets and alfalfa. The present-day Armstrong Ranch typifies commercial and agricultural development in Monterey County and along the central coast.

Regional History

Monterey. Captain Gaspar de Portolá was sent to Monterey with the objective of establishing Spain's first military base in Alta California (Hoover et al., 2002). After failing to find Monterey Bay on his first land expedition along the coast in 1769, he again set out with his party early the following year. He reached Monterey on May 24, 1770 and was followed by a support vessel carrying Father Junipero Serra and Captain Juan Pérez.

Father Junipero Serra founded a mission at the Presidio, which he moved to the Carmel Valley in 1771. Named Mission San Carlos Borroméo, the mission is located at the mouth of the Carmel River in present-day Carmel. Dedicated in 1797, it became the home of Father Serra in his later years. In Monterey, the Presidio and surrounding area became the focal point for military and commercial life in the Monterey Bay area. By 1796, a battery had been constructed consisting of fortifications known as "El Castillo" (Jackson et al., 1985). This site was equipped with several cannons and provided a defense for the bay, town of Monterey, and the Presidio. Both resources are listed in the National Register. El Castillo is individually listed in the National Register, and the Presidio is part of a National Register District.

Monterey was retained as the capital of Alta California following Mexican Independence in 1821, at which time the Port of Monterey was opened for trade. Settlement before Mexican Independence had been concentrated inside the walls of the Presidio. Following Independence and the opening of the port, settlement began to expand into what is now Old Monterey. Several Mexican-era adobes are still present and part of the Monterey Old Town Historic District, which is a designated National Historic Landmark District and listed in the California Inventory of Historical Resources and the National Register. The Monterey Old Town Historic District is a two-part, noncontiguous area in the City of Monterey that contains many of the historic buildings and adobes of Spanish and Mexican California. It was designated a Landmark District in 1970 due to its ability to convey the Spanish Colonial character of Monterey and California.

During the American Period, Monterey retained its regional importance. It was incorporated as a city in 1850 and remained a vital port. The first American Federal Courthouse in Monterey was located in the Gabriel de la Torre Adobe at 599 Polk Street. At the turn of the century, many Sicilian fishermen settled in Monterey and Cannery Row as the fishing industry, which focused primarily on sardines, became established in Monterey. The Italian character of Monterey endured until the 1950s when the sardine fisheries that supported Cannery Row collapsed. Cannery Row is currently maintained as a Monterey tourist attraction and community, and its family ties to Sicily remain strong.

Armstrong Ranch (previously Bardin Ranch). Armstrong Ranch in Monterey County is a 2,260-acre tract purchased by John G. Armstrong from James Bardin and the Bardin family in 1885. Armstrong Ranch is located north of Reservation Road. The original boundaries of the Armstrong Ranch included the proposed MPWSP Desalination Plant site, the subsurface slant wells site, and a portion of the Source Water Pipeline; however, the current ranch boundaries are significantly reduced.

Armstrong came to San Francisco in 1868 and later settled in Monterey County. In 1885, Armstrong purchased 1,372.5 acres of land west of the Monterey and Salinas Railroad grade from James Bardin of the Bardin Ranch. Armstrong purchased three additional parcels from the Bardin family, totaling 2,800 acres. Armstrong sold approximately 400 acres of land to the San Francisco Sand Company in 1906. In 1973, the California Department of Transportation (Caltrans) condemned a linear tract of land passing through the Armstrong Ranch for use as a state highway. Construction of Highway 1 across the Armstrong Ranch began in 1974 (Clark, 1991:19).

Regional Railroads

Southern Pacific Railroad and the Del Monte Express. The existing TAMC railroad tracks are adjacent to the Castroville Pipeline and the new Transmission Main, and consist of the original Southern Pacific Railroad to Monterey. In 1865, a group of San Francisco businessmen formed Southern Pacific Railroad to construct a railroad from San Francisco to San Diego.

During the early 1870s, the Southern Pacific Railroad Company expanded its line down the Salinas Valley, stopping in Soledad. The line was used both as a freight line for farmers to ship produce north to the San Francisco region and as a passenger line for travelers heading to southern Monterey County destinations. From Soledad, southbound travelers could transfer to the Coast Line Stage Company stage routes (Ryan and Breschini, 2000). After buying up the narrow-gauge Monterey and Salinas Valley Railroad (see below) in 1879, Southern Pacific regraded the railroad route to Monterey as a standard-gauge line in 1880 and gained control of rail traffic in the Monterey area.

In coordination with the acquisition of the rail line to Monterey, the Pacific Improvement Company (PIC), the holding company for the owners of the Southern Pacific Railroad—Charles Crocker, Collis P. Huntington, Mark Hopkins, and Leland Stanford—built the Del Monte Hotel in Monterey. The palatial resort hotel was an attempt to attract a passenger trade for the railroad. When the Del Monte Hotel was opened in 1880, Southern Pacific began daily railroad service from San Francisco to the Monterey called the “Monterey Express.” After the reopening of the second Del Monte Hotel, the rail service was renamed the “Del Monte Express” in 1889 (Hoffmann, 2001a:4). Early Del Monte Express trains included a club car and a parlor-lounge-observation car, and catered to the tourist trade (Hoffmann, 2001a:5).

In 1888, Southern Pacific made plans to extend the rail service through Monterey to Pacific Grove and then on to the Carmel River (Oehlert, 1978:41). The railroad construction began in 1889, passed the Monterey Customs House and ended in Pacific Grove near Lake Mejela (Oehlert, 1978:42–43). The route to the Carmel River was never completed.

The Del Monte Express service was powered by steam engines until 1955, when diesel engines replaced them (Hoffmann, 2001b:4). Other changes occurred in the mid-twentieth century that had an effect on the railroad. From World War II on, after the Del Monte Hotel became a Naval school, the number of tourist passengers using the Del Monte Express dropped (Hoffmann, 2001b:5). The advent of the automobile also had its effect on rail service. By 1957, rail service to Pacific Grove was cut back and the route ended at Monterey. In 1959, the U. S. Postal Service cancelled its San Francisco to Pacific Grove route, which used the train, and Southern Pacific started petitioning the California Public Utilities Commission to discontinue the Del Monte Express (Hoffmann, 2001b:6). In 1971, 82 years after it was started, the Del Monte Express service was terminated (Hoffmann, 2001b:6).

Monterey and Salinas Valley Railroad. The Monterey and Salinas Valley Railroad extended across the proposed MPWSP Desalination Plant site. In response to skyrocketing freight rates charged by the Southern Pacific Railroad, a group of Salinas Valley citizens began calling for an independently owned and operated railroad. Several prominent Monterey County businessmen formed the Monterey and Salinas Valley Railroad and filed articles of incorporation in February 1874 in the Monterey County Court House. Construction of the 18.5-mile narrow-gauge railroad began in April 1874 (Clark, 1991:322). The railroad began in Monterey near Adam Street and extended north beyond Marina, turning northeast across the valley to the Salinas River and finally heading southeast toward Salinas. The Monterey and Salinas Valley Railroad was the first narrow-gauge railroad in California and was designed to carry freight and passengers. As noted by Fabing and Hamman (1985), the Monterey and Salinas Valley Railroad completed its first round-trip in October 1874, bringing "...beans and barley from the J. Bardin Ranch."

As a result of financial losses, the Monterey and Salinas Valley Railroad was forced into bankruptcy not long after it began operation. The Southern Pacific Railroad purchased the Monterey and Salinas Valley Railroad in August 1879 at a foreclosure sale. The Southern Pacific Railroad replaced the narrow-gauge tracks from Castroville to Monterey with a new standard gauge line. The narrow-gauge line from Salinas to Marina (crossing the Bardin Ranch) was abandoned. Southern Pacific sold the Monterey and Salinas Valley Railroad locomotives, track, and equipment to the Nevada Central Railway.

Sand Mining

This discussion is relevant to the project facilities located in the CEMEX sand mining facility (subsurface slant wells and the segment of the Source Water Pipeline located east of Lapis Road). Beginning almost immediately after construction of the railroad and expanding following the 1906 earthquake in San Francisco, a sand mining industry developed along Monterey Peninsula's shore. Companies used sand from the coastal dunes that line Monterey Bay to produce both glass and building materials. Sand from Monterey's coastline was hauled by railroad and used in the rebuilding of San Francisco, as well as in the growing cities and towns across the state. The San Francisco Sand Company opened the CEMEX sand mining facility (also referred to herein as the Lapis Sand Mining Plant) north of Marina in 1906 and constructed a small spur from the main line that extended west to the dunes. At the industry's height, between 300,000 and 400,000 cubic yards of sand were removed annually from the region (Herbert et al., 2010:18). The CEMEX sand mining facility is the only remaining sand mining facility in operation in Monterey Bay and represents one of the earliest and largest sand mining operations in southern Monterey Bay. (SWCA, 2014).

4.15.2.2 Paleontological Setting

Existing conditions in the project area were evaluated based on a review of site-specific geotechnical reports. Paleontological literature from the University of California Museum of Paleontology database was also reviewed. No field surveys for paleontological resources were conducted for the proposed project.

Paleontological Assessment Standards

The Society of Vertebrate Paleontology (SVP) has established guidelines for the identification, assessment, and mitigation of adverse impacts on nonrenewable paleontological resources (SVP, 1996, 2010). Most practicing paleontologists in the United States adhere closely to the SVP's assessment, mitigation, and monitoring requirements as outlined in these guidelines, which were approved through a consensus of professional paleontologists and reflect the currently accepted standard practices. Many federal, state, county, and city agencies have either formally or informally adopted the SVP's standard guidelines for the mitigation of adverse construction-related impacts on paleontological resources. The SVP has helped define the value of paleontological resources and, in particular, indicates the following:

- Vertebrate fossils and fossiliferous (fossil-containing) deposits are considered significant nonrenewable paleontological resources and are afforded protection by federal, state, and local environmental laws and guidelines.
- A paleontological resource is considered to be older than recorded history, or 5,000 years before present, and is not to be confused with an archaeological resource.
- Invertebrate fossils are not significant paleontological resources unless they are present within an assemblage of vertebrate fossils or they provide undiscovered information on the origin and character of the plant species, past climatic conditions, or the age of the rock unit itself.
- A project paleontologist, special interest group, lead agency, or local government can designate certain plant or invertebrate fossils as significant.
- In accordance with these principles, the SVP outlined criteria for screening the paleontological potential of rock units and established assessment and mitigation procedures tailored to such potential. **Table 4.15-1** lists the criteria for high-potential, undetermined, and low-potential rock units.

TABLE 4.15-1
CRITERIA FOR DETERMINING PALEONTOLOGICAL POTENTIAL

Paleontological Potential	Description
High	Geologic units from which vertebrate or significant invertebrate or plant fossils have been recovered in the past, or rock formations that would be lithologically and temporally suitable for the preservation of fossils. Only invertebrate fossils that provide new information on existing flora or fauna or on the age of a rock unit would be considered significant. Common examples are: • Most tertiary-age sedimentary rocks, especially fine-grained, low-energy deposits such as shale and mudstone • Pleistocene-age alluvial fans, lake/playa deposits, shallow marine deposits, and marine terraces
Undetermined	Geologic units for which little or no information is available.
Low	Geologic units that are not known to have produced a substantial body of significant paleontological material, as demonstrated by paleontological literature and prior field surveys, and which are poorly represented in institutional collections. Common examples are: • All intrusive igneous rocks (e.g., granites) • Most metamorphic rocks and volcanic rocks (e.g., marble, slate, schist, basalt, etc.) • Sediment deposited within the last 10,000 years (e.g., Holocene alluvium, bay muds/estuarine areas, slope wash, or recent landslide deposits)

SOURCE: SVP, 1996, 2010.

Although not discussed in the SVP standards, certain earth materials and rock units are highly unlikely to contain paleontological resources, such as artificial fills, surface soils, and high-grade metamorphic rocks. While such materials were originally derived from rocks, they have been altered, weathered, or reworked such that the discovery of intact fossils would be rare.

Geologic Setting and Paleontological Potential

Section 4.2, Geology, Soils, and Seismicity, describes the geologic units that the project components would be constructed on or within. Using the paleontological potential criteria described above in **Table 4.15-1**, the following geologic units may have the potential for paleontological resources:

- Older Dune Sands (Quaternary)
- Terrace Deposits (Pleistocene)
- Monterey Formation (Tertiary)

The marine Monterey Formation consists of siliceous and diatomaceous beds, with diatoms and some benthic foramanifera noted in the unit (Clark, 1997). Diatoms are a major group of algae and are among the most common types of phytoplankton. Most diatoms are unicellular, although they can exist as colonies in the shape of filaments or ribbons, fans, zigzags, or stars. Foraminifera are a phylum or class of amoeboid protozoa, characterized by a thin external net for catching food and usually an external shell. Most foraminifera are marine and typically live on or within the sea floor sediment (benthos), although a few species are floaters. The shells are commonly calcium carbonate or agglutinated sediment particles. They are usually less than 1 millimeter in size, but some are much larger, with the largest species reaching up to 20 centimeters. Diatoms and foraminifera are typically microfossils and are not readily apparent to the unaided eye. The Monterey Formation is an extensive unit and the noted microfossils are common. As shown on **Figure 4.15-1**, the Main System-Hidden Hills Interconnection Improvements is located in the Monterey Formation. However, this alignment is also within existing road right-of ways where most shallow soils would have been reworked or replaced with imported fill.

The University of California Museum of Paleontology (UCMP) website notes that the Monterey Formation covers an extensive area of the state and in places consists of marine deposits rich in fossils (UCMP, 2013). Fossil finds in the unit include whales and dolphins, as well as the large numbers of finely preserved crabs, along with kelps and other large soft-bodied seaweeds, which are seldom found as fossils elsewhere. A database search of the UCMP website indicated a large number of fossils have been collected from the Monterey Formation in Monterey County, with the majority of the finds consisting of the microfossils discussed above. In addition, the UCMP collection includes near-coastal invertebrate and vertebrate species, primarily fan worms, bivalves (i.e., mollusks, clams, oysters, mussels, and scallops), and one whale specimen from an unidentified Monterey County location. None of the specimens with identified locations are in or near the locations of the project components.

The UCMP database search indicated a few microfossils from the younger geologic units (Older Dune Sands and Terrace Deposits) but none near the locations of the project components.

4.15.2.3 Existing Site Conditions

Background Research

Environmental Science Associates conducted a records search at the Northwest Information Center (NWIC) of the California Historical Resources Information System at Sonoma State University on June 18, 2010 (File No. 09-1597) and updated on February 28, 2013 (File No. 12-0934) and May 31, 2016 (File No. 15-1766). The purpose of the records search was to: (1) determine whether known cultural resources have been recorded within the direct and indirect APE; (2) assess the likelihood for unrecorded cultural resources to be present based on historical references and the distribution of nearby resources; and (3) develop a context for the identification and preliminary evaluation of cultural resources. The records search consisted of an examination of the following documents:

- **NWIC base maps** (U.S. Geological Survey [USGS] Castroville, Monterey, Seaside, and Marina, California 7.5-minute topographic maps) to identify recorded archaeological sites and studies within a 1/2-mile radius of the proposed project and recorded architectural/ structural resources and studies conducted within or adjacent to the proposed project.
- **Resource Inventories:** California Department of Parks and Recreation (1976), *California Inventory of Historical Resources.* California Department of Parks and Recreation, Sacramento; California Office of Historic Preservation (2012), *Historic Properties Directory Listing for Monterey County* (through April 2012); California Department of Transportation (Caltrans), *Historic Bridge Inventory, District 4, Monterey County*, Updated 2010; California State Lands Commission Shipwreck Database.

- **Prehistoric Archaeology:** Jones, Terry, L., Nathan E. Stevens, Deborah A. Jones, Richard T. Fitzgerald, and Mark G. Hylkema, (2007), The Central Coast: A Midlatitude Milieu. In *California Prehistory: Colonization, Culture, and Complexity*. Jones, Terry L., Klar, Kathryn A., eds., Altamira Press, MD.
- **Ethnographic Sources:** Levy, Richard (1978), Costanoan. In *California, Handbook of North American Indians, Vol. 8*, edited by Robert F. Heizer, pp. 485–495; William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.; L. Kroeber (1925) *Handbook of the Indians of California*. Bureau of American Ethnology Bulletin 78. Smithsonian Institution, Washington, D.C.
- **Historical Background Sources:** Gudde, Erwin G. (1988), *California Place Names: The Origin and Etymology of Current Geographical Names*. Berkeley: University of California Press; Hoover, M.B., H.E. Rensch, E.G. Rensch, W.N. Abeloe (2002), *Historic Spots in California*. Revised by Douglas E. Kyle. Palo Alto, CA: Stanford University Press.
- **Historical Maps:** An extensive online historical map collection with approximately 50 maps and views of the Monterey Bay area is available online at http://davidrumsey.com.

Native American Consultation

The Native American Heritage Commission was contacted on October 19, 2010 to request a database search for sacred lands or other cultural properties of significance within or adjacent to the proposed project. An updated request was sent on June 13, 2016. A response was received on June 14, 2016. The sacred lands file did not contain any information on the presence of cultural resources in the vicinity of the proposed project. The Commission provided a list of Native American contacts that might have further knowledge of cultural resources in the vicinity of the proposed project. MBNMS conducted consultations according to the requirements of the National Historic Preservation Act (NHPA) of 1966, as amended. Native American consultation with the Ohlone tribes will be ongoing throughout the project.

Records Search Results

Records on file at the NWIC indicate that both architectural/structural and archaeological resources have been previously recorded within the records search radius, as defined in Study Methods above. The southwestern portion of the records search radius is located within an area rich in both prehistoric and historic-era resources, including the Monterey Old Town Historic District, the historic Presidio of Monterey, and the National Register-listed El Castillo (a large prehistoric habilitation site). The recently evaluated Lapis Sand Mining Plant Historic District in the vicinity of the proposed Source Water Pipeline has been determined eligible for listing in the National Register and the California Register (SCWA, 2014) (see the discussion under the heading, MPWSP Test Slant Well, below, for additional discussion).

Previous Studies

Dozens of cultural resources investigations have been completed in the project vicinity, primarily in the city of Monterey. Numerous shell middens as well as the Spanish- and Mexican-period occupations have been the focus of several studies and investigations. Several studies completed for linear projects (including the installation of fiber-optic cable, water lines, and the railroad) have evaluated cultural resources in the northern part of the proposed project. The closure of Fort

Ord resulted in several studies that included cultural resources surface surveys, archaeological and architectural evaluations, and an archaeological sensitivity study.

Portions of the project area were surveyed within the past decade for other projects using current standards and reporting methods. These previous studies are described below. Those areas previously surveyed within the past 5 years were not resurveyed for the proposed project.

CalAm Coastal Water Project EIR Cultural Resources Investigation

In 2009, Jones and Holson from Pacific Legacy, Inc. completed a cultural resources investigation for the Coastal Water Project (CWP) Environmental Impact Report (SCH No. 2006101004) (CPUC, 2009). There is some overlap between the proposed project and the facilities that were evaluated in the CWP EIR (Jones and Holson, 2009). Busby (2005) also completed a cultural resources assessment to support the CWP EIR.

Busby (2005) and Jones and Holson (2009) reviewed the archival records and previous studies completed within the CWP area and summarized those inventory efforts. They also completed a surface survey in select locations of the CWP area that had not been recently surveyed by a qualified archaeologist.

Monterey Peninsula Light Rail Transit Project Studies

Far Western Anthropological Group, Inc. (Far Western) and JRP Historical Consulting LLC (JRP) surveyed the Monterey Branch Line of the Southern Pacific Railroad in 2010 for the TAMC's proposed Light Rail Transit Project (Herbert et al., 2010; Ruby, 2010). Their study included an in-depth geoarchaeological assessment of the Monterey coastal area from Moss Landing to Pacific Grove, discussed above in Section 4.15.2.2, as well as a surface survey of the TAMC corridor including the Castroville Pipeline and the new Transmission Main.

Far Western and JRP surveyed the TAMC's proposed Light Rail Transit Project corridor, which included the railroad right-of-way from Castroville to Monterey. The majority of the survey was completed using narrow (less than 7-meter) transects; however, in some locations the survey area was wider, and transects were spaced approximately 20 meters apart. Visibility varied along the railroad tracks as the ground surface was covered in railroad ballast. Dense ice plant and pavement also obscured portions of the survey area.

Far Western recorded one prehistoric site adjacent to the Castroville Pipeline (see Study Findings below). As described in Section 4.15.2.2, above, the geoarchaeological assessment for the TAMC's proposed Light Rail Transit Project concluded that the corridor traverses areas with stream or river crossings, estuaries, and lagoons that are highly sensitive for buried prehistoric archaeological sites (Meyer in Ruby, 2010).

JRP recorded and evaluated the Monterey Branch Line of the Southern Pacific Railroad. With the exception of the Monterey Southern Pacific Passenger Depot (which was determined eligible for listing in the National Register in 2005 but is located outside of the direct APE), JRP recommended that the railroad and associated features were ineligible for listing in the National Register (or the

California Register) due to a lack of integrity (Herbert et al., 2010). As of this writing, the State Historic Preservation Officer (SHPO) has not yet concurred with this recommendation.

Fort Ord Studies

The ASR-5 and ASR-6 Wells would be located in the Fitch Park military housing community. Several cultural resources studies have been conducted within the boundaries of former Fort Ord, including: *Historical and Architectural Documentation Reports for Fort Ord* (Office of Directorate of Environmental Programs, 1993); *Historic-period Archaeological Survey at Henneken's Ranch and the Windmill Site, Fort Ord, Monterey County, California* (Bowman et al., 1994); *Management Summary of the Historic Period Archaeological Survey at Fort Ord, Monterey County, California* (Bowman, 1994); *A Cultural Resources Survey of 783 Hectares, For Ord, Monterey County, California* (Waite, 1994); *An Inventory of Historic-period Archaeological Sites at Fort Ord, Monterey County, California* (Babson, 1993); and *Historical and Architectural Documental Reports for Fort Ord, California* (Lapp et al., 1993). While Stilwell Hall and 35 other buildings were determined eligible for listing in the National Register, none of these architectural or structural resources are located at the ASR-5 and ASR-6 Well sites.

Archaeological sensitivity studies of the former Fort Ord military base were performed to determine the nature and extent of archaeological resources on the base (Swernoff, 1981; U.S. Army Corps, 1992; Waite, 1994). During the 1981 study a total 1,047.5 acres were surveyed. While only one prehistoric archaeological resource has been recorded within the former Fort Ord military base, the paucity of sites within the large (+20,000-acre) military base can be attributed to the long period of U.S. Army occupation at the base and the resulting major disturbances; the shifting nature of the western half of the base's soils in dune areas; the steep nature of the eastern portion of the base; the marginal nature of much of the soils and landforms within the base; and the small percentage of archaeologically surveyed areas or subsurface archaeological testing (Swernoff, 1981).

The Advisory Council of Historic Preservation (ACHP), the SHPO, and the U.S. Army entered into a Programmatic Agreement to address issues related to cultural resources during base closure. The Programmatic Agreement incorporated the results of the archaeological survey completed by the U.S. Army and includes provisions for handling any previously unidentified cultural resources or human remains discovered during environmental testing and cleanup.

MPWSP Test Slant Well Studies

This discussion is relevant to the subsurface slant wells at the CEMEX active mining area. As discussed in Chapter 3, Description of the Proposed Project, CalAm has constructed a test slant well at the CEMEX active mining area in north Marina. Environmental review covering the construction of the test slant well and operation of the pilot program was completed by the Monterey Bay National Marine Sanctuary in accordance with NEPA requirements in October 2014 and by the California Coastal Commission (CCC) in accordance with CEQA requirements in November 2014. The test slant well was also evaluated by the city of Marina in the *California American Water Slant Test Well Project Draft Initial Study/Mitigated Negative Declaration* (State Clearinghouse No. 2014051060) (City of Marina, 2014).

Under contract to the city of Marina and as part of that earlier CEQA effort, SWCA Environmental Consultants (SWCA) prepared a cultural resources investigation and evaluation for the test slant well (SWCA, 2014). SWCA evaluated the CEMEX sand mining facility (referred to therein as the Lapis Sand Mining Plant and CEMEX Plant) and determined it to be a Historic District eligible for listing in the National Register and the California Register under Criteria A/1 (association with an important event) and Criteria C/3 (architectural merit). The Lapis Sand Mining Plant Historic District includes several contributing resources: the Sorting Plant, Washing Plant, Canal Flume, Lapis Siding, Superintendent's Residence, Bunkhouse, Garage/Office, Maintenance Shop, Scale House and Office, and a number of small ancillary buildings spread throughout the property. The settling ponds and dredging pond located in the active mining area, just north of the Source Water Pipeline, were initially developed as part of the modernization of the facility in 1959–1960 (SWCA, 2014).

SWCA determined that development of the test slant well would result in direct damage or removal of the Lapis Siding, causing a significant impact on a Historic District contributor. SWCA recommended that the project be redesigned to avoid direct impacts on the Lapis Siding in adjacent areas that do not contain structures associated with the Lapis Sand Mining Plant. Several other contributing resources are located in close proximity of proposed trenching and earthmoving activities; however, given the industrial nature of the site, these activities would be consistent with the ongoing operations of the CEMEX sand mining facility. Construction and operation of the test slant well was not anticipated to have any visual effects on the Historic District because the test slant well and related components would be below ground (SWCA, 2014).

SWCA did not identify any archaeological resources at the CEMEX sand mining facility. However, SWCA recommended that all construction workers and supervisory personnel be required to attend a cultural resources awareness training session and that an archaeological monitor be present during any ground-disturbing activities occurring within 100 feet of historic buildings (SWCA, 2014).

Survey Methods and Conditions

Environmental Science Associates surveyed portions of the direct APE that had not been recently surveyed according to current standards on October 26 and 27, 2010; November 29 and 30, 2010; September 20, 2012; March 8, 2013; June 7, 2013; April 24, 2014, and June 28, 2016 (Koenig and Brewster, 2014). Aerial photographs of the project vicinity and copies of USGS 7.5-minute topographic maps showing previously recorded cultural resources were used in the field to guide the survey effort. The survey corridor varied depending on location and project component. In narrow survey areas, transects were spaced approximately 5 to 10 meters apart. In wider survey areas, such as the desalination plant direct APE and the subsurface slant wells direct APE, survey transects were spaced approximately 10 to 20 meters apart.

Paved or built-up portions of the proposed project study area, such as streets in Monterey, Seaside Sand City, Marina, and unincorporated areas, were subject to a cursory survey that included driving the project route to identify historic-era buildings or other structures located within the indirect APE. Photographs were taken to document the typical styles of each neighborhood or block. Areas of exposed ground surface, including adjacent landscaping, were periodically checked, especially in the direct APE nearest to areas containing previously recorded cultural resources.

For the 2010 survey effort, permission was obtained to access the CEMEX active mining area (location of the proposed subsurface slant wells).

Two previously developed Programmatic Agreements identified procedures for managing cultural resources in the project vicinity in accordance with the NHPA: a March 1993 Programmatic Agreement between the U.S. Army, the ACHP, and the SHPO addresses historic properties and accidental discovery procedures for the Presidio of Monterey Historic District. An April 1994 Programmatic Agreement between the U.S. Army, the ACHP, and the SHPO established that the Phase I Archaeological Survey for prehistoric sites identified no historic properties within the contiguous boundaries of the former Fort Ord military base. The Fort Ord Programmatic Agreement also summarized accidental discovery and monitoring requirements for continued environmental cleanup activities within the former Fort Ord military base property (cited in Reese, 2004).

During the surface surveys, all exposed ground surface was checked for evidence of cultural materials or other evidence of past human use and occupation. Surface visibility was highly variable throughout the APE. Rodent burrow back dirt piles, cut banks, and exposed sand dune areas were closely inspected for indicators of archaeological deposits. Encountered cultural resources were formally recorded on the appropriate Department of Parks and Recreation 523 forms. All resources were photographed and plotted on a USGS 7.5-minute topographic quadrangle.

The proposed project is located in several diverse settings, including active and stable dune formations, paved city streets, and the Carmel Valley. Direct APE locations nearest to previously recorded resources, including landscaped areas or other areas of exposed soils, were thoroughly inspected, as described below:

- The direct APE for the subsurface slant wells is located on the west side of active coastal dunes. Visibility was good (approximately 90 percent). This area has been highly disturbed from the activities at the CEMEX sand mining facility. The contributing resources to the Lapis Sand Mining Plant Historic District were noted during the survey.
- The MPWSP Desalination Plant direct APE was covered in low-lying grasses. The soil was a light brown sandy loam, and visibility was moderate (approximately 50 percent).
- City streets in Marina, Seaside, Sand City, Monterey, and unincorporated areas as well as along the Highway 68 satellite systems were paved, offering limited visibility. Unpaved areas adjacent to roadways were inspected, but natural vegetation and landscaping obscured the ground surface.

Study Findings

Architectural/Structural Resources

Subsurface Slant Wells, MPWSP Desalination Plant, and Improvements to ASR System

No historical resources listed in or eligible for listing in the California Register or historic properties listed in or eligible for listing in the National Register are located in the direct or indirect APE of the subsurface slant wells, the MPWSP Desalination Plant, or the two additional ASR injection/extraction wells (the ASR-5 and ASR-6 Wells), the ASR Pump-to-Waste Pipeline, the ASR Conveyance Pipeline, and the ASR Recirculation Pipeline.

Pipelines and Other Conveyance Facilities

No historical resources eligible for listing in the California Register or historic properties listed in or eligible for listing in the National Register are located in the direct or indirect APE for the proposed Brine Discharge Pipeline, Brine Mixing Box, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

Previously identified cultural resources are in the vicinity of the direct and indirect APE of the Source Water Pipeline (Lapis Sand Mining Plant Historic District); the Castroville Pipeline, the new Desalinated Water Pipeline, and the new Transmission Main (Monterey Branch Line of the Southern Pacific Railroad).

The ***Lapis Sand Mining Plant Historic District*** is in the direct and indirect APE of the Source Water Pipeline. SWCA recorded and evaluated the historic district in 2014 as eligible for listing in the National Register and the California Register (**Figure 4.15-2**). The historic district comprises several contributing elements including the Sorting Plant, Washing Plant, Canal Flume, Lapis Siding, Superintendent's Residence, Bunkhouse, Garage/Office, Maintenance Shop, Scale House and Office, a number of small ancillary buildings spread throughout the property, several settling ponds, and a dredging pond. The section of the proposed Source Water Pipeline located within the CEMEX sand mining facility would be aligned approximately 65 feet from the north side of contributing buildings to the District. As the buildings and structures contributing to the District are outside of the direct and indirect APE, no further consideration of the architectural components of this resource is necessary for the proposed project. On May 3, 2017, the SHPO concurred with a finding of No Historic Properties Affected for the proposed project (Polanco, 2017).

- The ***Monterey Branch Line of the Southern Pacific Railroad (P-27-002923)*** is adjacent to the Castroville Pipeline, the new Desalinated Water Pipeline, and the new Transmission Main. Fourteen contributing resources, including the railroad line and associated buildings, have been evaluated for their eligibility to the National Register (Herbert et al., 2010). One building (located outside the direct and indirect APE)—the Monterey Southern Pacific Passenger Depot—was recommended eligible for individual listing in the National Register. Previous evaluations of the railroad found that the surveyed portions and related structures, including the trestle at Tembladero Slough and the steel Warren Truss Bridge at the Salinas River, are not eligible for listing in the National Register.

  The most recent recording and evaluation effort included all portions of the Monterey Branch Line from Moss Landing to Monterey. The evaluation concluded that while the Monterey Branch Line appears to meet the significance criteria for listing in the National Register, it lacks integrity to convey its significance. Therefore, it was recommended to be ineligible for listing in the National Register (Herbert et al., 2010). As a result, no further consideration of this resource is necessary for the proposed project.

Archaeological Resources

Subsurface Slant Wells

No prehistoric or historic-era archaeological resources have been previously identified in the direct APE for the subsurface slant wells. No archaeological resources were identified in this direct APE during the 2010–2016 survey effort. There are no known TCPs in the vicinity of the subsurface slant wells.

While not comprehensive, the California State Lands Commission Shipwreck Database does not list known maritime resources in the vicinity of the Subsurface Slant Wells.

MPWSP Desalination Plant

No prehistoric archaeological resources have been previously identified in the direct APE for the MPWSP Desalination Plant. No prehistoric archaeological resources were identified in this direct APE during the 2010–2016 survey effort. There are no known TCPs in the vicinity of the MPWSP Desalination Plant. One historic-era resource, a railroad grade, has been previously identified in the MPWSP Desalination Plant direct APE.

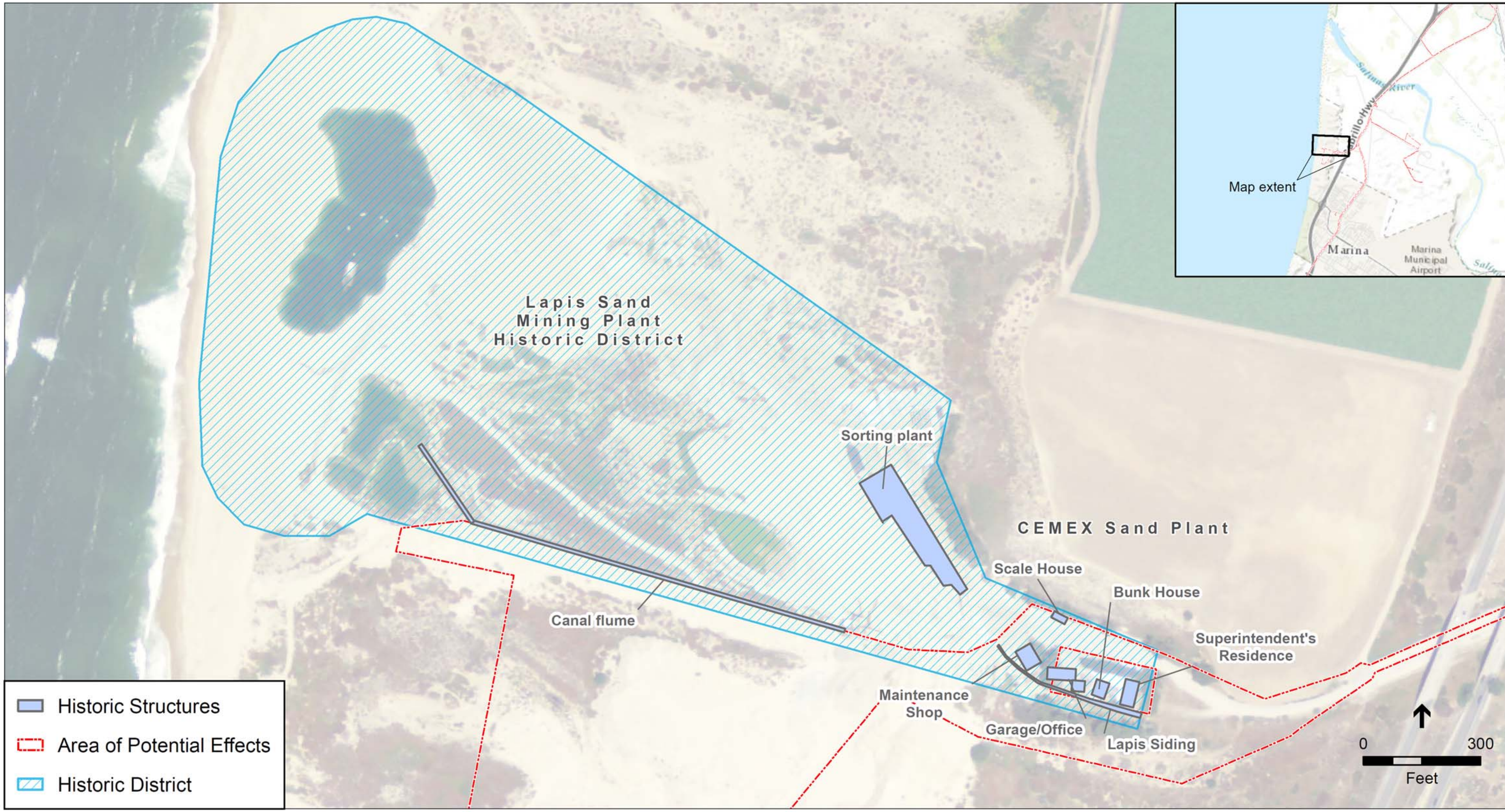
- ***P-27-002417*** *(CA-MNT-2080H)*, a historic-era, narrow-gauge railroad grade, was recorded by Morgan et al. in 1998. The railroad grade consisted of cuts through low hills and sand dunes with raised berms across low-lying areas. No ties, spikes, or other artifacts related to the railroad were observed. The railroad grade represents the remains of California's first narrow-gauge railroad—the Monterey and Salinas Valley Railroad. This railroad was constructed by local farmers to facilitate the shipping of produce to Salinas and was incorporated in 1874 (Morgan et al., 1998b). Jones and Holson revisited the grade in 2008 and recorded three discontinuous segments (Jones and Holson, 2009). The railroad grade is mapped within the proposed MPWSP Desalination Plant direct APE.

  The railroad grade was not identified in the MPWSP Desalination Plant direct APE during the 2010 survey effort; this site is presumed to have been graded or otherwise leveled in the recent past. Because there are no remaining features associated with the railroad grade in the APE, no further consideration of this resource is necessary for the proposed project.

Pipelines and Other Conveyance Facilities North of Reservation Road

Proposed pipelines and other conveyance facilities north of Reservation Road include the Pipeline to CSIP Pond, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Brine Discharge Pipeline, and the Brine Mixing Box. There are no known TCPs in the vicinity of these project components. One prehistoric resource has been previously recorded adjacent to the Castroville Pipeline direct APE. A historic-era fence line has been previously recorded adjacent to the direct APE of the Pipeline to CSIP Pond. Additionally, the Lapis Sand Mining Plant Historic District is within the direct APE of the Source Water Pipeline.

- Resource ***P-27-001207*** *(CA-MNT-1154)* is recorded as an area of midden, shell fragments, chert flakes, and a few historic-era glass fragments on the north side of Tembladero Slough east of the Castroville Pipeline. According to an article from *The Monterey Peninsula Herald* in 1979, a human burial was reportedly uncovered along Tembladero Slough in 1879 during construction of the Southern Pacific Railroad tracks.



SOURCE: National Map, ESRI

205335.01 Monterey Peninsula Water Supply Project

Figure 4.15-2

Historic Resources in the Source Water Pipeline APE

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Prior documentation consists of a 1978 site record (Melander, 1978), a 1984 topographic plot (Basin, 1984), and a more recent site recording in 2010 (Ruby, 2010). According to the 1978 site record, the site is directly west of Salinas Road (Castroville Road / Highway 183) and is most visible on the south side of the knoll along Tembladero Slough, where flakes, shell, and glass were eroding. Melander did not have direct access to the main site area and was not able to fully delineate boundaries. He noted that Locus B of CA-MNT-727, a prehistoric habitation site, was directly across the road on the east side of Castroville Road / Highway 183 and that CA-MNT-1154 may represent a component of CA-MNT-727. The site boundaries plotted by Basin in 1984 place the site to the east of the direct APE of the Castroville Pipeline, downslope from the Southern Pacific Railroad tracks in the vicinity of the existing ranch complex.

In 2010, Far Western archaeologists revisited the area for the TAMC Light Rail Transit Project and recorded weathered clamshell, a couple of chert flakes, and some broken glass and ceramics adjacent to the railroad tracks from the slough bank for approximately 150 meters (45 feet) to the north. The site boundaries were expanded to include the railroad tracks and an unknown boundary to the west (Ruby, 2010).

Environmental Science Associates conducted a subsurface study in the vicinity of CA-MNT-1154 on June 28, 2016. Two archaeologists walked the direct APE of the Castroville Pipeline on the east side of the Southern Pacific Railroad tracks as well as adjacent to a cultivated field on the west side of the tracks. Within the cultivated field, clamshell fragments were noted however these appear to be associated with agricultural activities (i.e. soil augmentation) and not with a prehistoric use area as no midden soil or other evidence of human use or occupation such as lithic fragments were identified. On the east side of the tracks, in the direct APE, no shell was noted. A few fragments of modern window and bottle glass were identified, but no historic-era glass or ceramics were observed. The soil adjacent to the tracks in the direct APE consisted of artificial fill; at a distance of approximately 10 feet from the tracks the native soil was a medium brown silty sand with gravel inclusions. The area adjacent to Tembladero Slough in both the direct APE and on the west side of the tracks had been highly disturbed from both construction of the existing trestle as well as from erosion. No cultural materials or midden soil was identified in the slough banks.

Based on the previous site documentation and the current survey effort, it does not appear that a significant prehistoric archaeological site (CA-MNT-1154) is within the direct APE of the Castroville Pipeline, however this is not conclusive. While no midden soil or artifacts were observed in the direct APE, there was reportedly a human burial uncovered in the vicinity. Section 4.15.6, Direct and Indirect Effects of the Proposed Project, below, provides recommendations regarding potential archaeological resources and/or human remains in the vicinity of Tembladero Slough.

- Resource ***P-27-002416*** *(CA-MNT-2079H)*, a historic-era fence line, was first recorded by Morgan et al. in 1998. The resource consists of two segments of fence and is adjacent to the Pipeline to CSIP Pond direct APE. The fence was constructed from 4- by 6inch vertical posts, 1- by 6-inch horizontal rails at the top and bottom, and vertical pickets of various sizes between the posts. Barbed wire was stapled to the fence. A chain-link fence had replaced a large section of the historic fence at the Monterey Regional Wastewater Treatment Plant. Pacific Legacy revisited the fence in 2008. At that time, the fence appeared to be in the same general condition as described by Morgan et al. (Jones and Holson, 2009).

The fence was originally recorded in association with the Armstrong Ranch (Morgan et al., 1998a). The Armstrong Ranch (P-27-002415) also consisted of a former historic-era building cluster, a windmill (Feature 1), and a 120-foot-long fence line (Feature 2). A row of Cypress trees (Linear Feature 1), access roads, and a sparse artifact concentration were also noted. At the time of the 1998 recording, the buildings (including a residence, barn, and outbuildings) had been demolished and the vicinity graded and leveled for use as an equipment yard and agricultural field. The site was described as lacking integrity with limited data potential (Morgan et al., 1998a).

In 2005, the area was resurveyed and functioned as an equipment storage yard and a staging area (Busby, 2005). The windmill had been removed by that time. Based on the surface components of the site, the Armstrong Ranch was recommended as ineligible for listing in the National Register and the California Register under any of the criteria (Busby, 2005).

The fenceline was revisited during the 2010 survey effort. Section A of the fenceline is located in the direct APE, south of a row of Cypress trees along the access road leading to the Monterey Regional Water Treatment Plant. Section A consists of 4- by 6-inch vertical posts with barbed wire. Most of the posts have collapsed, and the barbed wire has been removed. Cross boards are scattered in the Cypress trees. Much of the segment has been replaced with a modern chain-link fence beginning at the water treatment plant's entrance gate. Section B of the fenceline is outside of the direct APE.

Section A of the fence does not appear to meet any criteria for listing in the National Register, either individually or as a district contributor. The fenceline is associated with the Armstrong Ranch, which is an early American-period ranch in the Monterey Bay area; however; the fence itself does not represent an important event in the history of California (Criterion A) and is not specifically associated with a significant person (Criterion B). The fence does not represent the craftsmanship of a master builder or style of construction (Criterion C) and does not have the potential to yield information important to history (Criterion D). Furthermore, the fence does not retain integrity of design, materials, workmanship, or feeling because a substantial portion of the original fence has been replaced by a chain-link fence. The fenceline has been previously recommended as ineligible for listing in the California Register (Busby, 2005:29), and the assessment of the fenceline performed for this study concurs with this recommendation. In addition, the fenceline does not appear eligible for the National Register, and no further consideration of this resource is necessary for the proposed project.

- ***Lapis Sand Mining Plant Historic District.*** Previous survey efforts did not identify any archaeological resources in the portion of the Source Water Pipeline direct APE located within the CEMEX sand mining facility (SWCA, 2014). However, the area surrounding this section of the pipeline alignment is generally considered to have a high potential for buried cultural resources associated with prehistoric populations and Native Americans. Additionally, the historic-era use of the CEMEX sand mining facility may have generated archaeological deposits, including refuse pits and buried foundations. As a result, the direct APE for this pipeline section should be treated as potentially sensitive for the presence of both prehistoric and historic-era archaeological resources. The area of greatest sensitivity is the eastern portion of the facility because this area contains buildings that are contributing elements of the Lapis Sand Mining Plant Historic District. This area has been subject to less ground disturbance from sand mining than the western portion of the Source Water Pipeline direct APE, and is more likely to contain intact prehistoric sites or buried historic-era archaeological features associated with the sand mining facility. Section 4.15.6, Direct and Indirect Effects of the Proposed Project, below, provides recommendations regarding potential archaeological resources in the Lapis Sand Mining Plant Historic District.

Improvements to ASR System

The proposed improvements to the Seaside Groundwater Basin ASR System include installation of two additional ASR injection/extraction wells (the ASR-5 and ASR-6 Wells), the ASR Pump-to-Waste Pipeline, the ASR Conveyance Pipeline, and the ASR Recirculation Pipeline. No prehistoric or historic-era archaeological resources have been previously identified in the direct APE for these improvements. No archaeological resources were identified in the direct APE for these improvements during the 2010–2016 survey efforts. There are no known TCPs in the vicinity of these project components.

Pipelines and Other Conveyance Facilities South of Reservation Road

Pipelines and other conveyance facilities south of Reservation Road include the new Transmission Main, Carmel Valley Pump Station, and interconnection improvements for Highway 68 satellite systems (i.e., Ryan Ranch-Bishop and Main System-Hidden Hills). There are no known prehistoric or historic-era archaeological resources or TCPs in the vicinity of these project components.

Summary of Cultural Resources Identified

This section summarizes significant cultural resources within the direct and indirect APE of the project components.

- **Subsurface Prehistoric Archaeological Resources.** Based on the geoarchaeological assessment described under Geological Context and the Study Results, there is the potential for buried prehistoric archaeological resources to exist at the locations shown on **Figure 4.15-1** as well as in the vicinity of the Castroville Pipeline at Tembladero Slough. Impact 4.15-2, below, analyzes the potential for project implementation to adversely affect previously unidentified prehistoric archaeological resources.
- **Subsurface Historic-era Archaeological Resources.** There is potential for unknown historic-era subsurface archaeological resources to be uncovered during installation of the Source Water Pipeline through the Lapis Sand Mining Plant Historic District. Artifacts or features related to the early establishment of the mining facility could be identified. Impact 4.15-2, below, analyzes the potential for project implementation to adversely affect previously unidentified historic-era archaeological resources.

4.15.3 Regulatory Framework

This section provides an overview of applicable federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as “regulatory requirements”) relevant to cultural and paleontological resources. A brief summary of each is provided, along with a finding regarding the project’s conformity with those regulatory requirements. The conformity findings concern the project as proposed, without mitigation. Where the project, as proposed, would be consistent with the applicable regulatory requirement, no further discussion of project consistency with that regulatory requirement is provided. Where the project, as proposed, would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to a specific impact in Section 4.15.6, Direct and Indirect Effects of the Proposed Project. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

4.15.3.1 Federal Regulations

National Historic Preservation Act

Section 106 of the National Historic Preservation Act of 1966 (54 U.S.C. § 300301 et seq.), as amended, requires that a federal agency with direct or indirect jurisdiction over a proposed federal or federally assisted undertaking, or issuing licenses or permits, consider the effect of the proposed undertaking on historic properties. A historic property may include a prehistoric or historic-era building, structure, object, site or district included in, or eligible for inclusion in, the National Register maintained by the U.S. Secretary of the Interior. Federal agencies must also allow the ACHP to comment on the proposed undertaking and its potential effects on historic properties.

The implementing regulations for Section 106 of the NHPA (36 CFR 800) require consultation with the SHPO, the ACHP, federally recognized Indian tribes and other Native Americans, and interested members of the public throughout the compliance process. The four principal steps are:

- Initiate the Section 106 process, including determination whether the proposed Federal action is an undertaking, and if so, whether it is a type of activity that has the potential to cause effects on historic properties, and consultation with interested parties (36 CFR 800.3);
- Identify historic properties, i.e., resources included in or eligible for inclusion in the National Register (36 CFR 800.4);
- Assess the effects of the undertaking on historic properties within the area of potential effect (36 CFR 800.5); and
- Resolve adverse effects (36 CFR 800.6).

Adverse effects on historic properties are often resolved through preparation of a Memorandum of Agreement or Programmatic Agreement developed in consultation between the federal agency, the SHPO, Indian tribes, and interested members of the public. The ACHP is also invited to participate. The agreement describes stipulations to mitigate adverse effects on historic properties listed in or eligible for the National Register (36 CFR 60).

National Register of Historic Places

The National Historic Preservation Act established the National Register as "an authoritative guide to be used by federal, state, and local governments, private groups and citizens to identify the Nation's historic resources and to indicate what properties should be considered for protection from destruction or impairment" (36 CFR Section 60.2). The National Register recognizes both historic-era and prehistoric archaeological properties that are significant at the national, state, and local levels.

To be eligible for listing in the National Register, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Buildings, structures, objects, sites or districts of potential significance must meet one or more of the following four established criteria (NPS, 1990):

A. Are associated with events that have made a significant contribution to the broad patterns of our history;

B. Are associated with the lives of persons significant in our past;

C. Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Have yielded, or may be likely to yield, information important in prehistory or history.

Unless the property possesses exceptional significance, it must be at least 50 years old to be eligible for National Register listing (NPS, 1990).

In addition to meeting the criteria of significance, a property must have integrity. Integrity is defined as "the ability of a property to convey its significance" (NPS, 1990). The National Register recognizes seven qualities that, in various combinations, define integrity. To retain historic integrity a property must possess several, and usually most, of these seven aspects. Thus, the retention of the specific aspects of integrity is paramount for a property to convey its significance. The seven factors that define integrity are location, design, setting, materials, workmanship, feeling, and association.

Although the National Register standards for historic integrity are high, the National Register accepts that a property "must also be judged with reference to the particular criteria under which a resource is proposed for eligibility." Most archaeological properties are evaluated under Criterion D; the most applicable qualities of integrity under this criterion are those of location, materials, and association.

Integrity also defines the research potential of a resource. To possess research potential, archaeological data must have integrity in the form of what has been called "focus" (Deetz, 1977). Focus in this context means the accuracy with which the archaeological remains represent a situation or condition. When focus is absent or inadequate because of disturbance, a resource does not retain integrity. Remains that represent several activities or have materials that cannot be separated from one another into discrete contexts may also lack focus and therefore integrity.

The MPWSP would be consistent with the NHPA requirements because MBNMS will initiate the Section 106 process, including consultation with interested parties; identify historic properties; assess the effects of the undertaking on historic properties within the Area of Potential Effect; and resolve adverse effects to historic properties.

Coastal Zone Management Act

Several sections of the Coastal Zone Management Act (CZMA) address the protection of cultural resources. This includes 16 U.S.C. Section 1452, which states that it is a national policy to encourage the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and esthetic values, as well as the requirement for federal actions that affect any land or water use or natural resource of a state's coastal zone to be consistent with the enforceable policies of the state coastal management program.

4.15.3.2 State Regulations

Office of Historic Preservation

The State of California implements the National Historic Preservation Act through its statewide comprehensive cultural resources surveys and preservation programs. The Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation, implements the policies of the National Historic Preservation Act on a statewide level. The OHP also maintains the California Historical Resources Inventory. The SHPO is an appointed official who implements historic preservation programs within the state's jurisdictions.

California Register of Historical Resources

The California Register is "an authoritative guide in California to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1[a]). The criteria for California Register eligibility are based on National Register criteria (PRC Section 5024.1[b]; California Code of Regulations [CCR], Title 14, Section 4850 et seq.). Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for, or listed in, the National Register.

To be eligible for the California Register, a prehistoric or historic-era property must be significant at the local, state, and/or federal level under one or more of the following four criteria, which are similar to federal criteria. The resource:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history [PRC 5024.1(c)].

An eligible resource for the California Register must meet one of the criteria of significance described above and retain enough of its historical character or appearance (integrity) to be recognizable as a historical resource and to convey the reason for its significance.

Additionally, the California Register consists of resources that are listed automatically and those that must be nominated through an application and public hearing process. The California Register automatically includes the following:

- California properties listed in the National Register and those formally determined eligible for the National Register;
- California Registered Historical Landmarks from No. 770 onward; and
- California Points of Historical Interest that have been evaluated by the OHP and have been recommended to the State Historical Resources Commission for inclusion on the California Register in accordance with adopted criteria.

Resources that may be nominated to the California Register include:

- Individual historical resources;
- Historical resources contributing to the significance of an historic district under criteria adopted by the State Historical Resources Commission;
- Historical resources identified as significant in historical resources surveys, provided the survey meets the criteria listed in subdivision (g);
- Historical resources and historic districts designated or listed as city or county landmarks;
- Historic properties or districts that were designated or listed under a city or county ordinance, provided the criteria for designation or listing are consistent with the California Register; and
- Local landmarks or historic properties designated under any municipal or county ordinance.

California Environmental Quality Act

Historical Resources

CEQA requires lead agencies to determine, prior to approval, if a project would have a significant adverse effect on historical or unique archaeological resources.

The CEQA Guidelines generally recognize that a historical resource includes: (1) a resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register (PRC Section 5024.1); (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); and (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record (14 CCR Section 15064.5[a]).

If a lead agency determines that an archaeological site is a historical resource, the provisions of PRC Section 21084.1 of CEQA and CEQA Guidelines Section 15064.5 apply. If an archaeological site does not meet the criteria for a historical resource contained in the CEQA Guidelines, then the site may be treated as a "unique" archaeological resource in accordance with the provisions of PRC Section 21083. As defined in Section 21083.2, a unique archaeological resource is an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions, and there is a demonstrable public interest in that information;
- Has a special and particular quality such as being the oldest of its type or the best available example of its type; or
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

A non-unique archaeological resource is an archaeological artifact, object, or site that does not meet the criteria in PRC Section 21083.2(g) and need not be given further consideration, other than the simple recording of its existence by the lead agency if it so elects (PRC Section 21083.2[h]). The CEQA Guidelines note that if an archaeological resource is neither a unique archaeological nor a historical resource, the effects of the project on that resource shall not be considered a significant effect on the environment (14 CCR Section 15064.5[c][4]).

PRC Section 15064.5(f) requires a lead agency to make provisions for handling the accidental discovery of historical or unique archaeological resources during construction. Provisions include an immediate evaluation of the find by a qualified archaeologist. Work may continue on other parts of the project site while historical or unique archaeological resource mitigation takes place.

In the event that human remains are discovered in any location other than a dedicated cemetery, PRC Section 15064.5(e) requires all work to stop until the county coroner in which the remains are discovered is contacted. If the coroner determines the remains to be Native American, the coroner must contact the Native American Heritage Commission within 24 hours. The Commission would then identify any person or persons it believes to be the most likely descended from the deceased individual.

Paleontological Resources

Paleontological resources also are afforded protection by environmental legislation set forth under CEQA. Appendix G (Part V) of the CEQA Guidelines provides guidance relative to significant impacts on paleontological resources, stating that a project will normally result in a significant impact on the environment if it will "…disrupt or adversely affect a paleontological resource or site or unique geologic feature, except as part of a scientific study."

The SVP has established standard guidelines that outline acceptable professional practices in the conduct of paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation. Most California State regulatory agencies accept the SVP standard guidelines as a measure of professional practice.

California Public Resources and Administrative Codes

Several sections of the California Public Resources Code protect paleontological resources. Section 5097.5 prohibits “knowing and willful” excavation, removal, destruction, injury, and defacement of any paleontological feature on public lands (lands under state, county, city, district, or public authority jurisdiction, or the jurisdiction of a public corporation), except where the agency with jurisdiction has granted express permission. Section 5097.5 of the Public Resources Code specifies that any unauthorized removal of paleontological remains is a misdemeanor. Further, the California Penal Code Section 622.5 specifies that any person who willfully injures, disfigures, defaces, or destroys any object or thing of archaeological or historical interest or value, whether situated on private lands or within any public park or place, is guilty of a misdemeanor. PRC Section 30244 requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands.

The MPWSP would be consistent with the State requirements because CalAm has determined whether the project would have a significant adverse effect on historical resources, unique archaeological resources, paleontological resources, and human remains.

The California Coastal Act, as outlined in PRC Section 30344, provides for an inventory of manmade resources of cultural, historic, economic, and educational importance to the public.

4.15.3.3 Applicable Land Use Plans, Policies, and Regulations

Table 4.15-2 describes the regional and local land use plans, policies, and regulations pertaining to cultural resources that are relevant to the proposed project and that were adopted for the purpose of avoiding or mitigating an environmental effect. Also included in Table 4.15-2 is an analysis of project consistency with such plans, policies, and regulations. Where the analysis concludes the proposed project would not conflict with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes the proposed project may conflict with the applicable plan, policy, or regulation, the reader is referred to Section 4.15.6, Direct and Indirect Effects of the Project, for additional discussion. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

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TABLE 4.15-2
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO CULTURAL AND PALEONTOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface Slant Wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.126:*** The following scenic and cultural resources are deemed to be particularly valuable, and the following policies should be pursued. 1. All archaeological resources which may be present in the Marina Planning Area shall be protected and preserved. To this end, development proposed in areas of high archaeological sensitivity, i.e., the terraces and benches along the Salinas River, the peripheries of vernal ponds, and coastal beaches, shall be required to undertake a reconnaissance by a qualified archaeologist, and, where artifacts are identified, to protect and preserve such resources.	This policy is intended to protect and preserve archaeological resources.	<u>Potentially Inconsistent</u>: No known archaeological resources are present in the areas of Marina where MPWSP components are proposed. However, areas of high archaeological sensitivity exist in the Source Water Pipeline vicinity. Additionally, ground-disturbing activities associated with construction of the Subsurface Slant Wells, Source Water Pipeline, Desalinated Water Pipeline, and Transmission Main could result in the inadvertent discovery of and damage to unknown archaeological resources. This issue is discussed further in Impact 4.15-2.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Conservation/ Open Space	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Policy COS-5.1:*** Identify and conserve archaeological, architectural, and historic resources within Seaside.	This policy is intended to conserve archaeological, architectural, and historic resources.	<u>Potentially Inconsistent</u>: No known archaeological, architectural, and historical resources are present in the areas of Seaside where MPWSP components are proposed. Construction of project components within Seaside's coastal zone and inland areas would not impact any architectural or historical resources. However, construction would involve ground disturbing activities that could result in the inadvertent discovery of and damage to unknown archaeological resources. This issue is discussed further in Impact 4.15-2.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Conservation/ Open Space	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Implementation Plan COS-5.1.1:*** Assess and Mitigate Impacts on Cultural Resources. Continue to assess development proposals for potential impacts on sensitive historic, archaeological, and paleontological resources pursuant to the California Environmental Quality Act (CEQA). a) For structures that potentially have historic significance, require that a study be conducted by a professional archaeologist or historian to determine the actual significance of the structure and potential impacts of the proposed development in accordance with CEQA Guidelines Section 15064.5. The City may require modification of the project and/or mitigation measures to avoid any impact on a historic structure, when feasible. Assess development proposals for potential impacts on significant paleontological resources pursuant to of the California Environmental Quality Act Guidelines. If the project involves earthworks, the City may require a study conducted by a professional paleontologist to determine if paleontological assets are present, and if the project will significantly impact the resources. If significant impacts are identified, the City may require the project to be modified to avoid impacting the paleontological materials, or require mitigation measures to mitigate the impacts.	This policy is intended to assess and mitigate impacts on cultural resources, including historic, archaeological, and paleontological resources.	<u>Potentially Inconsistent</u>: No known cultural resources are present in the areas of Marina where MPWSP components are proposed. Construction of project components within Seaside's coastal zone and inland areas would not impact any architectural or historical resources. However, construction would involve ground disturbing activities that could result in the inadvertent discovery of and damage to unknown archaeological resources. The proposed project would not affect any geologic units that are known or suspected to contain paleontological resources.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Public Service	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond Castroville Pipeline, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements, and Carmel Valley Pump Station	***Policy PS-12.5:*** The Monterey County Historic Resources Review Board shall: a. Review and make recommendations on restoration, rehabilitation, alteration, and demolition proposals affecting identified historical and cultural resources. b. Work for the continuing education of county residents concerning historic resources; c. Seek financial support from local, state, and federal governments as well as the private sector to protect, preserve, and enhance the County's historic resources; d. Coordinate its activities with all groups concerned with the preservation of historic resources; and Review projects that involve historic resources on the National Register of Historic Places, California Register of Historical Resources, or the County's Local Register of Historic Resources to assure projects are consistent with good preservation practices.	This policy is intended to ensure the continued protection of Monterey County's historical and cultural resources on the National Register of Historic Places, California Register of Historical Resources, or the County's Local Register of Historic Resources.	<u>Consistent</u>: The proposed project would not involve development that would affect previously identified historical and cultural resources within unincorporated areas of Monterey County.

TABLE 4.15-2 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO CULTURAL AND PALEONTOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Public Service	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements, and Carmel Valley Pump Station	***Policy PS-12.10:*** Historic landscape, consisting of resource features important to the setting of a designated historic site, such as mature trees and vegetation, walls and fences, within historic neighborhoods, districts, and heritage corridors for which there is an adopted plan shall be protected.	This policy is intended to protect historic landscapes contributing to the designation of those sites as historic.	<u>Consistent</u>: None of the project components are proposed for locations that would affect a historic landscape contributing to the designation of any historic site within unincorporated Monterey County.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Public Service	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements, and Carmel Valley Pump Station	***Policy PS-12.11:*** An active involvement in historic and cultural resource management programs and support for the efforts of the Monterey County's historical organizations to preserve the County's historical resources shall be continued.	This policy is intended to ensure continued preservation of the County's historical resources.	<u>Consistent</u>: The proposed project would not involve development that would affect previously identified historical resources within unincorporated areas of Monterey County.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Public Service	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipelines, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements, and Carmel Valley Pump Station	***Policy PS-12.12:*** Historical and cultural resources and sites shall be protected through zoning and other regulatory means. New development shall be compatible with existing historical resources to maintain the special values and unique character of the historic properties.	This policy is intended to protect historical and cultural resources (including historical character) from impacts of new development.	<u>Consistent</u>: The proposed project would not involve development that would affect previously identified historical resources within unincorporated areas of Monterey County.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Public Service	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements, and Carmel Valley Pump Station	***Policy PS-12.15:*** The special character of designated historic districts and neighborhoods shall be retained.	This policy is intended to ensure continued protection of designated historic districts and neighborhoods.	<u>Consistent</u>: None of the project components are proposed for locations that would affect a designated historic district within unincorporated Monterey County.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Specific Policies 2.9.3*** 1. No development proposals in archaeologically sensitive areas or in areas described in policy 2.9.2(2) above shall be categorically exempt from environmental review. 2. When sufficient planning flexibility does not permit avoiding construction on archaeological or other types of cultural sites, adequate preservation measures shall be required. Mitigation shall be designed in accordance with guidelines of the State Office of Historic Preservation and the State of California Native American Heritage Commission. Any adverse impacts of development on archaeological or paleontological resources will be mitigated to the maximum extent feasible. 3. Off-road vehicle use, unauthorized collecting of artifacts, and other activities which could destroy or damage archaeological or cultural sites shall be prohibited. 4. Public access to or over known archaeological or paleontological sites should be limited, and concentrated in areas where supervision and interpretive facilities are available.	This policy is intended to minimize disturbance to archaeologically sensitive areas and limit public access to known archaeological and paleontological sites.	<u>Potentially Inconsistent:</u> No known archaeological or paleontological resources are present in the North County Land Use Plan areas where MPWSP components are proposed. However, project components would involve ground disturbing activities that could result in the inadvertent discovery of and damage to unknown archaeological resources. This issue is discussed further in Impacts 4.15-2. The proposed project would not affect any geologic units that are known or suspected to contain paleontological resources.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***General Policy 2.9.1:*** North County's archaeological resources, including those areas considered to be archaeologically sensitive but not yet surveyed and mapped, shall be maintained and protected for their scientific and cultural heritage values. New land uses, both public and private, should be considered compatible with this objective only where they incorporate all site planning and design features necessary to minimize or avoid impacts on archaeological resources.	This policy is intended to minimize and avoid impacts of development on archaeological resources.	<u>Potentially Inconsistent:</u> No known archaeological resources are present in the North County Land Use Plan areas where MPWSP components are proposed. However, project components would involve ground disturbing activities that could result in the inadvertent discovery of and damage to unknown archaeological resources. This issue is discussed further in Impacts 4.15-2.

TABLE 4.15-2 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO CULTURAL AND PALEONTOLOGICAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***General Policies 2.9.2*** 1. Monterey County shall encourage the timely identification and evaluation of archaeological, historical, and paleontological resources, in order that these resources be given consideration during the conceptual design phase of land use planning or project development. 2. Whenever development is to occur in the coastal zone, including any proposed grading or excavation activity or removal of vegetation for agricultural use, the Archaeological Site Survey Office or other appropriate authority shall be contacted to determine whether the property has received an archaeological survey. If not, the parcel(s) on which the proposed development will take place shall be required to have an archaeological survey made if located: a. within 100 yards of the floodways of the Pajaro or Salinas Rivers, McCluskey, Bennett, Elkhorn, Moro Cojo, or Tembladero Sloughs, the Old Salinas River Channel or Moss Landing Harbor; b. within 100 yards of any known archaeological site (unless the area has been previously surveyed and recorded). The archaeological survey should describe the sensitivity of the site and appropriate levels of development, and development mitigation consistent with the site's need for protection. 3. All available measures, including purchase of archaeological easements, dedication to the County, tax relief, purchase of development rights, etc., shall be explored to avoid development on sensitive prehistoric or archaeological sites. 4. When developments are proposed for parcels where archaeological or other cultural sites are located, project design shall be required which avoids or substantially minimizes impacts on such cultural sites. To this end, emphasis should be placed on preserving the entire site rather than on excavation of the resource, particularly where the site has potential religious significance.	This policy is intended to avoid and minimize impacts of new development on archaeological, historical, and paleontological resources.	<u>Potentially Inconsistent:</u> No known archaeological, historical, or paleontological resources are present in the North County Land Use Plan areas where MPWSP components are proposed. However, areas of high archaeological sensitivity exist in the vicinity of proposed project components. Project construction would involve ground disturbing activities that could result in the inadvertent discovery of and damage to unknown archaeological resources. This issue is discussed further in Impacts 4.15-2. The proposed project would not affect any geologic units that are known or suspected to contain paleontological resources. None of the project components are proposed for locations that would affect a designated historic district within unincorporated Monterey County.
County of Monterey (inland areas)	North County Area Plan	Conservation/Open Space	Castroville Pipelines	***Policy NC-3.6:*** North County Historic Sites and other sites recommended by the Monterey County Historic Resources Review Board (HRRB) shall be considered for inclusion in a historical resources (HR) zoning district.	This program is intended to protect historic sites.	<u>Consistent</u>: The proposed project would not involve development that would affect previously identified North County Historic Sites and other sites recommended by the Monterey County Historic Resources Review Board (HRRB).
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Cultural Resources Policy A-1:*** The City of Seaside shall ensure the protection and preservation of archaeological resources at the former Fort Ord. ***Program A-1.1:*** The City of Seaside shall conduct a records search and a preliminary archaeological surface reconnaissance as a part of environmental review for any development project(s) proposed in a high archaeological resource sensitivity zone. ***Program A-1.2:*** The City of Seaside shall require that all known and discovered sites on the former Fort Ord with resources likely to be disturbed by a proposed project be analyzed by a qualified archaeologist with local expertise; recommendations made to protect and preserve resources and, as necessary, restrictive covenants imposed as a condition of project action or land sale. ***Program A-1.3:*** As a contractor work specification for all new construction projects, the City of Seaside shall include that during construction, upon the first discovery of any archaeological resource or potential find, development activity shall be halted within 50 meters of the find until ***the*** potential resources can be evaluated by a qualified professional archaeologist and recommendations made.	This program is intended to protect and preserve archaeological resources.	<u>Potentially Inconsistent:</u> No known archaeological resources are present within the areas of the former Fort Ord military base where the ASR Wells and Pipelines and Transfer Pipeline are proposed. However, ground-disturbing activities associated with the construction of these project components could result in the inadvertent discovery of and damage to unknown archaeological resources. This issue is discussed further in Impact 4.15-2.
U.S. Army Garrison, Presidio of Monterey	Integrated Cultural Resources Management Plan	Monterey County Installations and Facilities	ASR-5 and ASR-6 Wells and portions of the following pipelines occurring on Army land: ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline	Department of Defense Instruction 4715.16 and Army Regulation 200-1 require installations to develop an Integrated Cultural Resources Management Plan as an internal compliance document that integrates management and stewardship of cultural resources with ongoing mission activities and identifies compliance actions necessary to meet cultural resources regulatory requirements. General management actions that help prevent future impacts include consideration of cultural resources as early as possible in the project planning process, identification and avoidance of archaeologically and culturally sensitive areas, and ensuring that personnel responsible for the management of cultural resources receive adequate training.	This plan is intended to identify compliance actions necessary to meet federally mandated historic and cultural resources regulatory requirements.	<u>Consistent</u>: The proposed project would not involve development that would affect previously identified historical and cultural resources within Monterey County.

**TABLE 4.15-2 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO CULTURAL AND PALEONTOLOGICAL RESOURCES**

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Cultural Resources Policy A-1:*** The County of Monterey shall ensure the protection and preservation of archaeological resources at the former Fort Ord. ***Program A-1.1:*** The County of Monterey shall conduct a records search and a preliminary archaeological surface reconnaissance as a part of environmental review for any development project(s) proposed in a high archaeological resource sensitivity zone. ***Program A-1.2:*** The County of Monterey shall require that all known and discovered sites on the former Fort Ord with resources likely to be disturbed by a proposed project be analyzed by a qualified archaeologist with local expertise, recommendations made to protect and preserve resources and, as necessary, restrictive covenants imposed as a condition of project action or land sale. ***Program A-1.3:*** As a contractor work specification for all new construction projects, the County of Monterey shall include that during construction, upon the first discovery of any archaeological resource or potential find, development activity shall be halted within 50 meters of the find until the potential resources can be evaluated by a qualified professional archaeologist and recommendations made.	This policy is intended to minimize and avoid impacts of development on archaeological resources.	<u>Potentially Inconsistent:</u> No known archaeological resources are present within the areas of the former Fort Ord military base where the ASR Wells and Pipelines and Transfer Pipeline are proposed. However, ground-disturbing activities associated with the construction of these project components could result in the inadvertent discovery of and damage to unknown archaeological resources. This issue is discussed further in Impact 4.15-2.

SOURCE: City of Marina, 2000; City of Seaside, 2004, 2013; City of Monterey, 2015; FORA, 1997; Monterey County 1982, 1985, 2010.

4.15.4 Evaluation Criteria

In accordance with Appendix G of the CEQA Guidelines, implementation of the proposed project would have a significant impact related to cultural and paleontological resources if it would:

- Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5;
- Directly or indirectly destroy a unique paleontological resource or site or unique geological feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

In accordance with Section 106 of the NHPA, this analysis also considers the potential for the proposed project to result in adverse effects on historic properties. In accordance with the specific Criteria of Effect and Adverse Effect defined in 36 CFR 800.5 for the evaluation of an undertaking's effects on historic properties, implementation of the proposed project would have a adverse effect related to cultural resources if it would:

> Cause an adverse effect on a historic property when it may alter the characteristics of the property that qualify the property for inclusion in the National Register. For the purpose of determining effect, alteration to features of the property's location, setting, or use may be relevant depending on a property's significant characteristics and should be considered.
>
> Cause an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:
>
> (1) Physical destruction, damage, or alteration of all or part of the property;
>
> (2) Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;
>
> (3) Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
>
> (4) Neglect of a property resulting in its deterioration or destruction; and
>
> (5) Transfer, lease, or sale of the property.

For the impact analysis, the State and federal evaluation criteria have been mutually considered. In addition, the NHPA adverse effect standard is equivalent to the NEPA significance standard. Under NEPA, significance is determined based on context and intensity. Impacts are analyzed in several contexts such as society as a whole, the affected region, the affected interests, and the locality. Intensity refers to the severity of effect, which includes factors such as the magnitude, geographic extent, duration, and frequency of the effect.

4.15.5 Approach to Analysis

Ground disturbance and excavation during project construction could disturb or destroy known and previously unrecorded cultural resources, including historical, archaeological, and paleontological resources and human remains. Proposed project operations would have no impact on cultural and paleontological resources because operations would not cause additional ground disturbance or generate strong vibrations. Thus, the analysis below focuses only on construction-related impacts on cultural and paleontological resources.

4.15.5.1 Architectural/Structural Historical Resources

Potential impacts on architectural resources are assessed by identifying whether implementation of the proposed project could affect resources that have been identified as historic properties for the purposes of the NHPA or as historical resources for the purposes of CEQA. Individual properties and districts include those that are significant because of their association with important events, people, or architectural styles or master architects, or for their informational value (National Register and California Register Criteria A/1, B/2, C/3, and D/4) and that retain sufficient historic integrity to convey their significance. Criterion D/4 is typically applied to the evaluation of archaeological resources and not to architectural resources, as described below. Once a resource has been identified as significant, it must be determined whether the impacts of the project would "cause a substantial adverse change in the significance" of the resource (CEQA Guidelines Section 15064.5[b]). A substantial adverse change in the significance of a historical resource means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of [the] historical resource would be materially impaired" (CEQA Guidelines Section 15064.5[b][1]). A historical resource is materially impaired through the demolition or alteration of the resource's physical characteristics that convey its historical significance and that justify its inclusion in (or eligibility for inclusion in) the California Register or a qualified local register (CEQA Guidelines Section 15064.5[b][2]).

Construction activities that involve impact tools can produce significant groundborne vibration. Substantive sources of vibration during project construction would be: (1) the drill rigs used for drilling and development of the subsurface slant wells in the CEMEX active mining area; (2) the drill rigs used for drilling and development of the ASR-5 and ASR-6 Wells at the Fitch Park military housing area; (3) bulldozers used during general construction of facilities such as the MPWSP Desalination Plant; (4) jackhammers used to break up concrete during open-trench construction of pipelines; and (5) vibratory rollers used to repave streets and other previously paved areas after open-trench construction and for newly paved areas at the MPWSP Desalination Plant, ASR-5 and ASR-6 Wells, and Carmel Valley Pump Station. Additionally, where it is not feasible to install the proposed pipelines via open-cut trenching (i.e., creek and river crossings, highway crossings, and railroad crossings), trenchless methods such as jack-and-bore, drill-and-burst, horizontal directional drilling, and/or microtunneling would be employed. Trenchless construction methods typically require the use of impact or vibratory sheet pile drivers, which are a source of vibration.

Construction-related vibration—such as that generated by jackhammers, drill rigs, and vibratory rollers—can cause structural damage to historic-era buildings and structures (Wilson, Ihrig & Associates, 2009:40). Historic buildings in the project vicinity include primarily older masonry structures in the city of Monterey as well as wood frame buildings and corrugated metal industrial buildings at the CEMEX sand mining facility. This EIR/EIS uses a vibration threshold for historic buildings of 0.12 inches per second (in/sec) peak particle velocity (PPV) at a distance of 25 feet (Wilson, Ihrig, & Associates et al., 2012:12). **Table 4.15-3** presents the distances at which vibratory construction equipment that would be used during project construction would generate vibration levels at the 0.12-in/sec PPV damage threshold. The vibratory roller is the construction equipment that would have the greatest PPV, typically a PPV of 0.210 in/sec at 25 feet (New Hampshire, 2012). The Federal Transit Administration (FTA) provides an equation for estimating vibration at different distances based on a reference PPV of 25 feet for varying construction equipment. Using the FTA equation, at distances greater than 45 feet the vibration generated by a vibratory roller is lower than the 0.12 in/sec PPV damage threshold. At distances greater than 25 feet, the vibration level generated by a typical drill rig is lower than the 0.12 in/sec PPV damage threshold. At distances greater than 80 feet, the vibration level generated by vibratory pile driving of sheet piles is lower than the 0.12 in/sec PPV damage threshold. Beyond the distance of the damage threshold, no damage to historic buildings or structures is expected.

TABLE 4.15-3
DAMAGE THRESHOLD TO HISTORIC BUILDINGS FROM CONSTRUCTION EQUIPMENT

Equipment Type	Typical PPV at 25 feet	Approx. Distance of Damage Threshold (0.12 PPV in/sec)
Vibratory roller	0.210 in/sec	45 feet
Drill rig	0.12 in/sec	25 feet
Bulldozer	0.089 in/sec	20 feet
Jackhammer	0.035 in/sec	15 feet
Vibratory pile driver	0.73 in/sec	80 feet

SOURCE: Wilson, Ihrig, & Associates et al., 2012

4.15.5.2 Archaeological Resources

The significance of most prehistoric and historic-era archaeological sites is usually assessed under National Register and California Register Criterion D/4. This criterion stresses the importance of the information potential contained within the site, rather than its significance as a surviving example of a type or its association with an important person or event. Archaeological resources may qualify as historical resources under the definition provided in CEQA Guidelines Section 15064.5(a), or they may also be assessed under CEQA as unique archaeological resources, defined as archaeological artifacts, objects, or sites that contain information needed to answer important scientific research questions (PRC Section 21083.2). A substantial adverse change in the significance of an archaeological resource is assessed similarly to other historical resources, i.e., it means the destruction or material alteration in an adverse manner of those physical characteristics of the resource that convey its significance under the relevant criteria (CEQA Guidelines Section 15064.5[b][2]).

4.15.5.3 Paleontological Resources

The paleontological analysis evaluates the potential to encounter paleontological resources (i.e., plant, animal, or invertebrate fossils or microfossils) during excavations associated with the proposed project. The paleontological potential of the geologic units that would be disturbed is used to evaluate the potential to encounter paleontological resources at the location of each project component. A potentially significant impact on paleontological resources would occur if: (1) construction of the project components would move or excavate previously undisturbed bedrock (native rock) and/or (2) the bedrock to be disturbed has a high paleontological potential. The potential impacts related to paleontological resources were analyzed qualitatively, based on review of published geologic and paleontological data for the project area and professional judgment. No paleontological field surveys were conducted for the proposed project.

4.15.5.4 Human Remains

Human remains, including those buried outside of formal cemeteries, are protected under several state laws, including PRC Section 5097.98 and Health and Safety Code Section 7050.5. These laws are identified above in Section 4.15.3.2, State Regulations. This analysis considers impacts including intentional disturbance, mutilation, or removal of interred human remains.

4.15.6 Direct and Indirect Effects of the Proposed Project

Table 4.15-4 summarizes the proposed project's impacts and significance determinations for cultural and paleontological resources.

TABLE 4.15-4
SUMMARY OF IMPACTS – CULTURAL AND PALEONTOLOGICAL RESOURCES

Impacts	Significance Determinations
Impact 4.15-1: Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 of the CEQA Guidelines or historic properties pursuant to 36 CFR 800.5 during construction.	NI
Impact 4.15-2: Cause a substantial adverse change during construction in the significance of an archaeological resource pursuant to Section 15064.5 of the CEQA Guidelines or historic properties pursuant to 36 CFR 800.5.	LSM
Impact 4.15-3: Directly or indirectly destroy a unique paleontological resource or site, or unique geological feature during construction.	LS
Impact 4.15-4: Disturbance of any human remains, including those interred outside of formal cemeteries, during construction.	LSM
Impact 4.15-C: Cumulative impacts related to cultural and paleontological resources.	LS

NOTES:
LS = Less than Significant
LSM = Less than Significant impact with Mitigation
NI = No Impact

4.15.6.1 Construction Impacts

Impact 4.15-1: Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 of the CEQA Guidelines or historic properties pursuant to 36 CFR 800.5 during construction. (*No Impact)*

All Project Components

No historical resources listed in or eligible for listing in the California Register or historic properties listed in or eligible for listing in the National Register are within the direct or indirect APE of all project components. Therefore, no impact on historical resources or historic properties would result from construction of any project facilities.

Mitigation Measures

None proposed.

Impact 4.15-2: Cause a substantial adverse change during construction in the significance of an archaeological resource pursuant to Section 15064.5 of the CEQA Guidelines or historic properties pursuant to 36 CFR 800.5. (*Less than Significant with Mitigation*)

Castroville Pipeline

There is potential for buried prehistoric archaeological resources to exist in the vicinity of Tembladero Slough. Based on the previous site documentation and survey effort, it does not appear that a significant prehistoric archaeological site is within the direct APE of the Castroville Pipeline, however this is not conclusive. While no midden soil or artifacts were observed in the direct APE, there was reportedly a human burial uncovered in the vicinity. If previously unidentified archaeological resources are discovered and inadvertently damaged and/or destroyed during installation of the Castroville Pipeline, this would be a significant impact or an adverse effect. Impacts on previously unidentified archaeological resources could be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.15-2a (Establish Archaeologically Sensitive Area)**. This measure requires cultural resources monitoring during project construction in an Archaeologically Sensitive Area (ASA) so that if archaeological resources are encountered, a qualified archaeological consultant can order cessation of work in the vicinity of the discovery and immediately assess the find to provide additional recommendations as necessary. Implementation of this mitigation measure would reduce potentially significant impacts on unknown prehistoric archaeological resources in the ASA to a less-than-significant level.

Based on the geoarchaeological assessment, there is potential for deeply buried well-developed soil horizons to be located in the direct APE at Tembladero Slough near Castroville and the Salinas River. Therefore, there is the potential for archaeological resources associated with those buried soils to be encountered during project work at the above locations. Project construction activities could result in damage or disturbance to such resources if they exist, a potentially significant impact or adverse effect. As discussed in the Geological Context, given the relatively narrow (maximum width of 7 feet) and linear nature of the ground disturbance for the pipelines, the active coastal dune environment (which may have destroyed, disturbed, and/or removed archaeological materials), as well as the paucity of previously discovered deeply buried sites in the Monterey Bay vicinity, no additional subsurface investigations are recommended. To mitigate potential impacts or adverse effects on previously unidentified buried archaeological resources in these ASAs, this EIR/EIS recommends **Mitigation Measure 4.15-2a (Establish Archaeologically Sensitive Area)**.

In addition there is the potential to uncover as yet undiscovered resources during project construction. To mitigate potential impacts on previously undiscovered buried archaeological resources, CalAm shall implement **Mitigation Measure 4.15-2b (Inadvertent Discovery of Cultural Resources)** for all project components. This measure would ensure that work would halt in the vicinity of an archaeological find and that the resources were treated appropriately.

Source Water Pipeline

There is potential for previously undocumented historic-era subsurface archaeological resources to be uncovered and inadvertently damaged and/or destroyed during installation of the Source Water Pipeline through the Lapis Sand Mining Plant Historic District. This would be a significant impact. However, impacts on previously unidentified subsurface historic-era resources in the Lapis Sand Mining Plant Historic District could be reduced to a less-than-significant impact with implementation of **Mitigation Measure 4.15-2a (Establish Archaeologically Sensitive Area)**.

In addition there is the potential to uncover as yet undiscovered resources during project construction. To mitigate potential impacts on previously undiscovered buried archaeological resources, CalAm shall implement **Mitigation Measure 4.15-2b (Inadvertent Discovery of Cultural Resources)** for all project components.

All Other Project Components

No archaeological resources eligible for listing in the California Register or the National Register are located within the direct APE for all other project components. Therefore, no impact on known archaeological resources would result from construction of these facilities. There is however the potential to uncover as yet undiscovered resources during project construction. To mitigate potential impacts on previously undiscovered buried archaeological resources, CalAm shall implement **Mitigation Measure 4.15-2b (Inadvertent Discovery of Cultural Resources)** for all project components.

There are no known TCPs in the vicinity of all project components. In the event that an archaeological resource that qualifies as a TCP is identified during project construction, CalAm shall implement **Mitigation Measure 4.15-2b (Inadvertent Discovery of Cultural Resources)**.

There are no known maritime resources, such as shipwrecks or other submerged resources, in the vicinity of all project components. Additionally, there will be no ground disturbing work in submerged areas that would have the potential to impact previously undocumented or unknown shipwrecks. The proposed project would not cause an impact on maritime resources within

MBNMS. To mitigate potential impacts on previously undiscovered maritime resources, CalAm shall implement **Mitigation Measure 4.15-2b (Inadvertent Discovery of Cultural Resources)** for all project components.

Land Use Plan & Policy Consistency

In addition to the physical impacts described above, as noted in **Table 4.15-2**, the proposed project could conflict with applicable land use plans, policies, or ordinances related to cultural resources that were adopted for the purpose of avoiding or mitigating an environmental effect. As described above, construction would involve ground-disturbing activities that could inadvertently disrupt or damage unknown archaeological sites. As a result, construction of project components could conflict with one or more of the following: California Coastal Act Section 30244, the City of Marina General Plan Policy 4.126, the City of Seaside Local Coastal Program Land Use Plan Policy LUD-CZ 2.11, Seaside General Plan Policy COS-5.1, the North County Land Use Plan Specific Policy 2.9.3 and General Policies 2.9.1 and 2.9.2, and the Fort Ord Reuse Plan Policy A-1 for Inland Areas and Monterey County. Each of these policies was adopted for the purpose of avoiding or minimizing impacts on archaeological resources. As discussed in the preceding paragraphs, **Mitigation Measures 4.15-2a (Establish Archaeologically Sensitive Area)** and **4.15-2b (Inadvertent Discovery of Cultural Resources)** would require archaeological monitoring and established protocols for accidental discovery of archaeological resources. With these measures implemented, the proposed project would be consistent with the above-noted policies.

Impact Conclusion

A significant impact on archaeological resources could occur during construction of the proposed Castroville Pipeline at Tembladero Slough and the Source Water Pipeline in the Lapis Sand Mining Plant Historic District; as well as those areas designated as archaeologically sensitive in the geoarchaeological analysis (Tembladero Slough near Castroville and the Salinas River). The impact or adverse effects would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.15-2a (Establish Archaeologically Sensitive Area)**.

While no additional impacts or adverse effects on archaeological resources are expected, the possibility of uncovering unknown archaeological resources in the remaining direct APE cannot be entirely discounted. The potential inadvertent discovery of archaeological resources could be a significant impact or adverse effect. Implementation of **Measure 4.15-2b (Inadvertent Discovery of Cultural Resources)** would ensure that potential impacts are less than significant.

Mitigation Measures

Mitigation Measure 4.15-2a applies to the Castroville Pipeline at Tembladero Slough and the Salinas River; and the Source Water Pipeline in the Lapis Sand Mining Plant Historic District.

Mitigation Measure 4.15-2a: Establish Archaeologically Sensitive Areas.

CalAm shall contract with a qualified archaeologist meeting the Secretary of the Interior’s Qualification Standard (Lead Archaeologist) to prepare and implement an Archaeological Monitoring Plan, and oversee and direct all archaeological monitoring activities during project construction. Archaeological monitoring shall be conducted for all subsurface excavation work within 100 feet of the Castroville Pipeline at Tembladero Slough and the Salinas River; and the Source Water Pipeline in the Lapis Sand Mining Plant Historic District. At a minimum, the Archaeological Monitoring Plan shall:

- Detail the cultural resources training program that shall be completed by all construction and field workers involved in ground disturbance;
- Designate the person(s) responsible for conducting monitoring activities, including Native American monitor(s), if deemed necessary;
- Establish monitoring protocols to ensure monitoring is conducted in accordance with current professional standards provided by the California Office of Historic Preservation;
- Establish the template and content requirements for monitoring reports;
- Establish a schedule for submittal of monitoring reports and person(s) responsible for review and approval of monitoring reports;
- Establish protocols for notifications in case of encountering cultural resources, as well as methods for evaluating significance, developing and implementing plan to avoid or mitigate significant resource impacts, Native American participation and consultation, collection and curation plan, and consistency with applicable laws including Section 7050.5 of the California Health and Safety Code and Section 5097.98 of the Public Resources Code;
- Establish methods to ensure security of cultural resources sites;
- Describe the appropriate protocols for notifying the County, Native Americans, and local authorities (i.e. Sheriff, Police) should site looting and other illegal activities occur during construction with reference to Public Resources Code 5097.99.

During the course of the monitoring, the Lead Archaeologist may adjust the frequency—from continuous to intermittent—of the monitoring based on the conditions and professional judgment regarding the potential to encounter resources.

If archaeological materials are encountered, all soil disturbing activities within 100 feet of the find shall cease until the resource is evaluated. The Lead Archaeologist shall immediately notify the CPUC and MBNMS of the encountered archaeological resource. The Lead Archaeologist shall, after making a reasonable effort to assess the identity, integrity, and significance of the encountered archaeological resource, present the findings of this assessment to the Lead Agencies. In the event archaeological resources qualifying as either historical resources pursuant to CEQA Section 15064.5 or as unique archaeological resources as defined by Public Resources Code 21083.2 are encountered, preservation in place shall be the preferred manner of mitigation.

If preservation in place is not feasible, the applicant shall implement an Archaeological Research Design and Treatment Plan (ARDTP). The Lead Archaeologist, Native American representatives, MBNMS and the CPUC shall meet to determine the scope of the ARDTP. The ARDTP will identify a program for the treatment and recovery of important scientific data contained within the portions of the archaeological resources located within the project Area of Potential Effects (APE); would preserve any significant historical information obtained and will identify the scientific/historic research questions applicable to the resources, the data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. The results of the investigation shall be documented in a technical report that provides a full artifact catalog, analysis of items collected, results of any special studies conducted, and interpretations of the resource within a regional and local context. All technical documents shall be placed on file at the Northwest Information Center of the California Historical Resources Information System.

Mitigation Measure 4.15-2b applies to all project components.

Mitigation Measure 4.15-2b: Inadvertent Discovery of Cultural Resources.

Following implementation of Mitigation Measure 4.15-2a, if prehistoric or historic-era cultural materials are encountered, all construction activities within 100 feet shall halt and the Lead Agencies shall be notified. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-period materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse.

For discoveries on lands other than Army-owned lands, a Secretary of the Interior-qualified archaeologist shall inspect the find within 24 hours of discovery. If the find is determined to be potentially significant, the archaeologist, in consultation with MBNMS, the CPUC and the appropriate Native American representative shall determine whether preservation in place is feasible. Consistent with CEQA Guidelines Section 15126.4(b)(3), this may be accomplished through planning construction to avoid the resource; incorporating the resource within open space; capping and covering the resource; or deeding the site into a permanent conservation easement. If avoidance is not feasible, a qualified archaeologist, in consultation with the Lead Agency and the appropriate Native American representative, shall prepare and implement a detailed Archaeological Research Design and Treatment Plan (ARDTP). Treatment of unique archaeological resources shall follow the applicable requirements of Public Resources Code Section 21083.2. Treatment for most resources would consist of (but would not be not limited to) sample excavation, artifact collection, site documentation, and historical research, with the aim to target the recovery of important scientific data contained in the portion(s) of the significant resource to be impacted by the project. The ARDTP shall include provisions for analysis of data in a regional context, reporting of results within a timely manner and subject to review and comments by the appropriate Native American representative before being finalized, curation of artifacts and data at a local facility acceptable to the appropriate Native American representative, and dissemination of final confidential reports to the appropriate Native American representative, the Northwest Information Center of the California Historical Resources Information System, the CPUC, MBNMS and interested professionals.

If cultural resources are inadvertently discovered during construction on Army-owned property, work shall immediately cease within a 100-foot radius of the find and the Army, Presidio of Monterey, Cultural Resources Manager (CRM) will be contacted to assess the discovery. For discoveries on Army lands, the CRM will implement procedures set forth in the Presidio's Integrated Cultural Resources Management Plant (ICRMP) and Army Regulation (AR 200-1), which may include completion of consultation under Section 106 of the National Historic Preservation Act (NHPA) prior to resuming construction in the vicinity of the find. CalAm shall be responsible for completing any additional archaeological work required to comply with federal regulations.

Impact 4.15-3: Directly or indirectly destroy a unique paleontological resource or site, or unique geologic feature during construction. (*Less than Significant*)

All Project Components

The construction of the project components would require the excavation through several geologic units that have the potential to contain paleontological resources, particularly vertebrate fossils. These geologic units include the Older Dune Sands, Marine Terrace Deposits, and the Monterey Formation. Vertebrate fossils have been collected from the Monterey Formation, but not from the other listed geologic units. Encountering fossils, particularly, vertebrate fossils, would be considered a significant impact.

As discussed above in Section 4.15.2.2, Paleontological Setting, and Section 4.15.3, Regulatory Framework, the SVP has established professional standards for evaluating the potential for paleontological resources based on the type of geologic unit, the previous discovery of fossils within the geologic unit and within or in close proximity to the proposed project, and whether the fossils are uncommon. Of the geologic units through which the project components would require excavation, only the Monterey Formation is known to have vertebrate fossils that would qualify as a significant paleontological resource. However, the project components would be constructed within a limited extent of the Monterey Formation within the previously-disturbed rights-of way. In addition, the diatoms and benthic foraminifera that comprise much of the formation are not considered a significant paleontological resource. Therefore, the potential impact on paleontological resources would be considered less than significant and no mitigation is necessary.

Mitigation Measures

None proposed.

Impact 4.15-4: Disturbance of any human remains, including those interred outside of formal cemeteries, during construction. (*Less than Significant with Mitigation*)

All Project Components

While no known human remains have been documented within the proposed project direct APE, the possibility of inadvertently uncovering human remains cannot be entirely discounted. The potential inadvertent discovery of human remains is considered a significant impact. The impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.15-4**

(Inadvertent Discovery of Human Remains). Mitigation Measure 4.15-4 would ensure that if human remains are uncovered during project construction the Most Likely Descendant of the deceased Native American is contacted and the remains are treated per the recommendations of the Coroner.

Mitigation Measures

Mitigation Measure 4.15-4 applies to all project components.

Mitigation Measure 4.15-4: Inadvertent Discovery of Human Remains.

In the event of discovery or recognition of any human remains during construction activities, such activities within 100 feet of the find shall cease. For discoveries on lands other than Army-owned lands, the Monterey County Coroner shall be contacted immediately. The Coroner then has two working days to determine if the remains are Native American. If the remains are determined to be Native American, and no investigation of the cause of death is required, the Native American Heritage Commission (NAHC) shall be contacted within 24 hours. The NAHC shall then identify and contact the person or persons it believes to be the Most Likely Descendant (MLD)" of the deceased Native American(s), who in turn would make recommendations to the project applicant, MBNMS and the CPUC for the appropriate means of treating the human remains and any grave goods.

If human remains are encountered during construction on Army-owned property, work shall cease within a 100-foot radius of the discovery and the CRM shall be notified immediately. The CRM shall initially evaluate the site to determine if the remains are either Native American in origin or associated with a recent crime scene (i.e. 50 years old or less). If the remains appear recent, the CRM shall notify the Army's Criminal Investigation Command who shall assume control of the crime scene and custody of the remains. If the remains appear to be Native American in origin, the CRM shall notify the Presidio Garrison Commander and implement procedures set forth in Section 3 of the Native American Graves Protection and Repatriation Act.

4.15.7 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects.

Impact 4.15-C: Cumulative impacts related to cultural and paleontological resources (*Less than Significant*)

The geographic scope of analysis for cumulative impacts on cultural resources includes the direct and indirect APE for the proposed project. The geographic scope of analysis for paleontological resources includes the portion of the aforementioned underlain by the Monterey Formation geologic unit.

The timeframe during which the proposed project could contribute to cumulative cultural resources effects is limited to the construction phase because operation of the proposed project would have no impact on cultural and paleontological resources.

A cumulatively significant cultural resources impact could result during construction if the incremental effects of the proposed project combined with those of one or more of the cumulative projects listed in **Table 4.1-2** to damage the same type of cultural resource within the APE.

Architectural Resources. No historical resources listed in or eligible for listing in the California Register or historic properties listed in or eligible for listing in the National Register are within the direct or indirect APE of all project components. Therefore, the project could not contribute to cumulative impacts on historical resources or properties (no impact). Although the CEMEX Removal Plan (No. 63) would destroy buildings and structures at the Lapis Sand Mining Plant Historic District, which would be a substantial adverse change to a historical resource, the MPWSP would not have an impact on cultural resources in this area, and would therefore have no cumulative impact on resources.

Archaeological Resources and Human Remains. As analyzed in the context of Impacts 4.15-2 and 4.15-4, excavation associated with the proposed project could result in a less-than-significant impact on known and previously unidentified archaeological resources and/or human remains following the implementation of recommended mitigation measures. This analysis conservatively assumes that all of the cumulative projects have a similar potential impact on known and previously unrecorded archaeological resources and/or human remains. Because each project's potential impacts would be site-specific, they could not overlap to combine with those of the proposed project and no significant cumulative effect would result (*less than significant*).

Paleontological Resources. The geographic scope of analysis for cumulative impacts on paleontological resources includes the Monterey Formation, which is known to contain significant paleontological resources including vertebrate fossils. While discovery within other geologic units affected by the project (i.e., Quaternary or Pleistocene) is possible, the likelihood is considered low because vertebrate fossils have only been collected from the Monterey Formation. The proposed project could result in a direct or indirect effect to paleontological resources located within these geologic units during excavation or other ground disturbing activities. The incremental impacts of the project could combine with those of one or more of the projects listed in **Table 4.1-2** to cause or contribute to a significant cumulative impact on paleontological resources if they directly or indirectly destroyed a unique paleontological resource or site or unique geologic feature.

As analyzed in the context of Impact 4.15-3, project components proposed within the Monterey Formation include two segments of the Monterey Pipeline and the Main System-Hidden Hills Interconnection Improvements. The proposed project's incremental contribution to potential cumulative effects was determined to be less than significant. Cumulative projects that also could affect the Monterey Formation include Laguna Seca Villas (No. 3), 459 Alvarado Street (No. 20), and Rancho Canada Village and Golf Club (Nos. 27 and 28). Ground disturbance associated with the cumulative projects could result in a cumulatively significant impact due to damage or destruction of a unique paleontological resource. The proposed project would not be expected to contribute considerably to such an effect because the components proposed for the Monterey Formation would occur within previously disturbed rights-of-way. Therefore, the proposed project's incremental contribution to potentially significant cumulative paleontological resources impacts would be less than significant.

References – Cultural and Paleontological Resources

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4.16 Agricultural Resources

As a result of comments received on the January 2017 Draft EIR/EIS, revisions have been made to this EIR/EIS section. Those changes include:

- *Updates to Table 4.16-1 to include the most recent Land Use Conversion data;*
- *Clarification about the historical use of the proposed MPWSP Desalination Plant site;*
- *Revision to Mitigation Measure 4.16-1 to include consultation with property owners during the construction season; and*
- *Additional language in the impact conclusion to Impact 4.16-2 to clarify that operation of the proposed project would not adversely affect farmland because the proposed project would result in less-than-significant impacts on groundwater quality and levels.*

This section evaluates the potential for implementation of the Monterey Peninsula Water Supply Project (MPWSP or proposed project) to adversely affect existing agricultural operations or agricultural resources in the vicinity.

4.16.1 Setting/Affected Environment

The study area for agricultural resources is the project area boundary and contiguous properties. The project area boundary is defined as the area within which all construction-related disturbances would occur. This section provides an overview of agricultural resources in the Monterey region and identifies the resources within and adjacent to the project area, including designated farmland, grazing land, and land protected by Williamson Act contracts. There are no Monterey Bay National Marine Sanctuary (MBNMS) resources that would be affected by impacts identified in this section; all impacts related to agricultural resources would occur outside of MBNMS boundaries. Therefore, MBNMS resources are not described in the environmental setting/affected environment.

Monterey County is California's third largest agricultural producer. Agricultural crop production and livestock grazing is the largest industry in the county, with approximately 56 percent of the land (or approximately 1.3 million acres) used for agricultural purposes. Of the total land in the county dedicated to agriculture, approximately 80 percent is used for grazing. The county's predominant crops are cool-season vegetables, strawberries, wine grapes, and nursery plants. Most of the agricultural lands are in the northern portion of the county and in the Salinas Valley (Monterey County, 2010).

Agricultural lands in the project area are concentrated north of Reservation Road in unincorporated Monterey County. This area contains a mosaic of predominantly row crop agricultural fields bordered by coastal dunes and beaches to the west. Project components proposed in this area include the Source Water Pipeline, MPWSP Desalination Plant, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, new Desalinated Water Pipeline, and Castroville Pipeline.

4.16.1.1 Farmland Classifications

Farmland Mapping and Monitoring Program

The California Department of Conservation, Division of Land Resource Protection (CDC) maps important farmlands throughout California through the Farmland Mapping and Monitoring Program (FMMP). Important farmland and agricultural land is classified into the following categories based on soil conditions (i.e., their suitability for agriculture) and current land use.

- ***Prime Farmland*** is land that has the best combination of physical and chemical characteristics for long-term crop production. It has the soil quality, growing season, and moisture supply needed to sustain high crop yields when appropriately treated and managed. In addition, the land must have been used for irrigated agricultural production four years prior to the mapping date to qualify under this category.
- ***Farmland of Statewide Importance*** is similar to Prime Farmland in that it has a good combination of physical and chemical characteristics for crop production, but with minor shortcomings such as greater slopes and less ability to store moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- ***Unique Farmland*** is land that does not meet the criteria for Prime Farmland or Farmland of Statewide Importance but has been used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include the types of non-irrigated orchards or vineyards that are found in some climatic zones of California. Unique Farmland must have been in agricultural production at some time during the four years prior to the mapping date.
- ***Farmland of Local Importance*** applies to land of importance to the local agricultural economy as determined by the county. This land is either currently producing crops or has the capability of production, but does not meet the criteria of the preceding categories. According to the CDC (2015a), there is no Farmland of Local Importance in Monterey County. Therefore, this category is not discussed further.
- ***Grazing Land*** is land on which the existing vegetation is suited to the grazing of livestock.

The FMMP updates its Important Farmland Series Maps every two years and produces a biannual report on the amount of land converted from agricultural to non-agricultural use. The most recent land use conversion data summarize land use conversion by FMMP category between 2012 and 2014. **Table 4.16-1** shows the total acreage and recent conversion of Prime Farmland, Unique Farmland, Farmland of Statewide Importance, and Grazing Land in Monterey County. In summary, there was a net decrease in acreage of Prime Farmland, a net increase in acreage in Farmland of Statewide Importance, and Unique Farmland, but a net decrease in grazing land between 2012 and 2014.

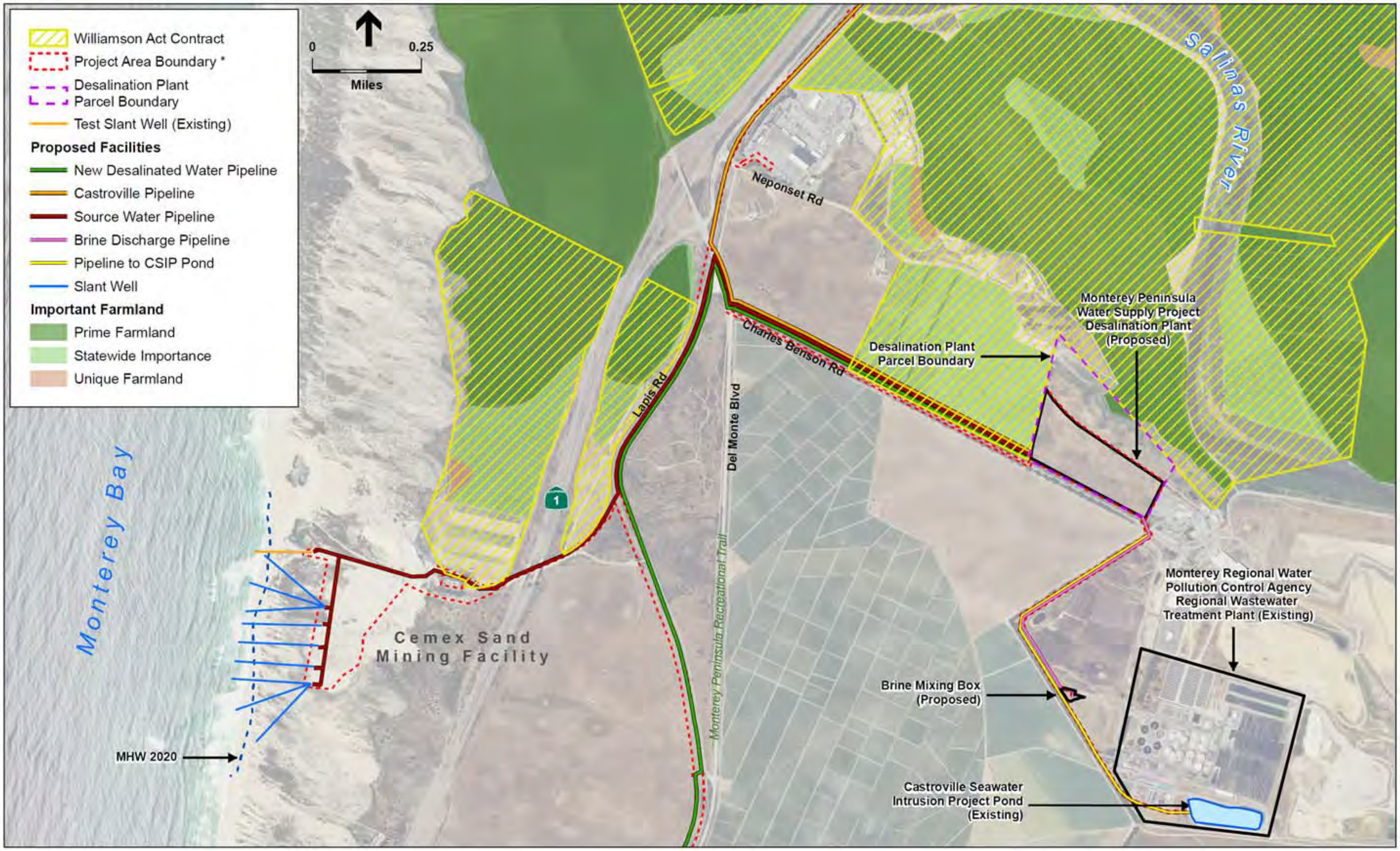
TABLE 4.16-1
MONTEREY COUNTY AGRICULTURAL LAND SUMMARY AND CONVERSION BY FMMP LAND USE CATEGORY (2012-2014)

	Total Acreage Inventoried		2012–2014 Acreage Changes			
Land Use Category	**2012**	**2014**	**Acres Lost (-)**	**Acres Gained (+)**	**Total Acreage Changed**	**Net Acreage Changed**
Prime Farmland	166,334	166,188	673	527	1,200	-146
Farmland of Statewide Importance	43,824	43,994	399	569	968	170
Unique Farmland	25,708	26,101	227	620	847	393
Important Farmland Subtotal	**235,866**	**236,283**	**1,299**	**1,716**	**3,015**	**417**
Grazing Land	1,063,438	1,062,699	1,816	1,077	2,893	-739
Agricultural Land Subtotal	**1,299,304**	**1,298,982**	**3,115**	**2,793**	**5,908**	**-322**
Urban and Built-up Land	57,927	58,147	11	231	242	220
Other Land	757,745	757,847	383	485	868	102
Water Area	6,246	6,246	0	0	0	0
Total Area Inventoried	**2,121,222**	**2,121,222**	**3,509**	**3,509**	**7,018**	**0**

SOURCE: CDC, 2016a.

Important Farmland Designations in the Project Area

As shown in the FMMP land use conversion data in Table 4.16-1, important farmland is classified as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland. As shown in **Figures 4.16-1** and **4.16-2**, portions of the project area north of Reservation Road are within or adjacent to important farmland. The farmland in this area is categorized as Prime Farmland and Farmland of Statewide Importance. Important farmland borders the west side of the Source Water Pipeline and the new Desalinated Water Pipeline along Lapis Road between the CEMEX access road and Del Monte Boulevard. The proposed alignments of the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline would be installed outside of the Charles Benson Road paved roadway, and within important farmland that borders the north side of Charles Benson Road and west side of the MPWSP Desalination Plant site. If the Source Water Pipeline Optional Alignment, new Desalinated Water Pipeline Optional Alignment, and



NOTE:
*Project area boundary refers to the area within which all construction-related disturbance would occur.

SOURCE: ESA, 2016; CDC, 2015b, 2016b; Monterey County, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.16-1

Farmland Mapping Designations and Williamson Act Contracts

NOTE:
*Project area boundary refers to the area within which all construction-related disturbance would occur.

SOURCE: ESA, 2016; CDC, 2015b, 2016b; Monterey County, 2016

205335.01 Monterey Peninsula Water Supply Project
Figure 4.16-2
Farmland Mapping Designations and
Williamson Act Contracts for the Castroville Pipeline

Castroville Pipeline Optional Alignment 2 were implemented, pipeline installation in the important farmland would be avoided because these optional alignments would be installed within the paved roadway of Charles Benson Road.

The 25-acre MPWSP Desalination Plant site is located on the upper terrace of a 46-acre parcel. Approximately 1.7 acre in the lower terrace of the parcel is designated as Prime Farmland, but is outside of the project area. As indicated above, important farmland also exists west of, but outside of, the MPWSP Desalination Plant site (see **Figure 4.16-1**). The proposed desalination plant site layout therefore, provides for a 200 foot buffer from the adjacent farmland west of the site as shown in Figure 3-5b in Chapter 3, Description of the Proposed Project.

North of Neponset Road and south of the Salinas River crossing, important farmland borders the east side of the Castroville Pipeline and TAMC right-of-way for approximately 0.25 mile (1,200 feet). The remaining 2.75 miles of the Castroville Pipeline, between the Salinas River and Highway 183, would be installed in Monte Road and a dirt agricultural road (see **Figures 4.16-1** and **4.16-2**). Although most of Monte Road and the dirt agricultural road are mapped as important farmland, no crops are planted within these roads; they are used for the movement of vehicles, semi-trucks, and farm equipment.

Approximately 950 feet of the Castroville Optional Alignment 1 would be installed along Nashua Road, and 1,900 feet of the Castroville Optional Alignment 1 would be installed along the Monterey Peninsula Recreational Trail and east of Highway 1. These areas are mapped as important farmland but no crops are planted in Nashua Road or the recreational trail. Approximately 1.2 miles (6,350 feet) of the Castroville Pipeline Optional Alignment 1 that is located east-to-west along Nashua Road and north-south along the Monterey Peninsula Recreational Trail is bordered to the north and east by important farmland, respectively (see **Figure 4.16-2**).

South of Reservation Road, land uses within and adjacent to the project area are predominantly urban and do not include agriculture, and the proposed facilities south of Reservation Road would not be within or adjacent to any important farmland (CDC, 2015b).

4.16.1.2 Williamson Act Program

The California Land Conservation Act of 1965, also known as the Williamson Act, is the State's primary program aimed at conserving private land for agricultural and open space uses. The Williamson Act provides a mechanism through which private landowners can contract with counties and cities to voluntarily restrict their land to agricultural and compatible open space uses. In return, Williamson Act contracts offer tax incentives by ensuring that land is assessed for its agricultural productivity rather than its highest and best use. Contracts typically restrict land use for a period of 10 years; however, some jurisdictions exercise the option to extend the term for up to 20 years. Contracts are automatically renewed annually unless the landowner files for non-renewal or petitions for cancellation. The CDC is responsible for administering the Williamson Act and prepares countywide maps of lands enrolled in Williamson Act contracts.

In 2013, Monterey County had a total of 732,954 acres of agricultural land protected under Williamson Act contracts and was ranked third in an assessment of California counties with the greatest number of new Williamson Act enrollments (CDC, 2015c).

Williamson Act Contracts in the Project Area

Lands under Williamson Act contract are present at several locations in the project area north of Reservation Road (see **Figures 4.16-1** and **4.16-2**). Lands under Williamson Act contract extend across a portion of the CEMEX access road west of Highway 1, and border the north side of the CEMEX access road between Highway 1 and Lapis Road. The Source Water Pipeline would be buried underneath the CEMEX access road. In addition, Williamson Act contracts border the west side of the Source Water Pipeline and the new Desalinated Water Pipeline alignments along Lapis Road between the CEMEX access road and Del Monte Boulevard. The proposed alignments for the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline would be installed within the southern edge of Williamson Act land located on the north side of Charles Benson Road and west of the MPWSP Desalination Plant site. Since the Source Water Pipeline Optional Alignment, new Desalinated Water Pipeline Optional Alignment, and Castroville Pipeline Optional Alignment 2 would be installed within the paved roadway of Charles Benson Road, implementation of these optional alignments would avoid construction in Williamson Act lands.

Williamson Act contracts border the south side of the Castroville Pipeline and TAMC right-of-way for approximately 1.4 miles between Neponset Road and the Monte Road/Nashua Road intersection. Roughly 0.5 mile of the section of Castroville Pipeline that would be installed in the dirt agricultural road located north of Monte Road/Nashua Road is mapped as land under Williamson Act contracts. However, as stated above, no crops are planted within the agricultural road as it has historically been and is currently used for the movement of vehicles, semi-trucks, and farm equipment. The eastern 0.8-mile of pipeline in the dirt agricultural road is bordered to the north by Williamson Act lands. The Castroville Pipeline Optional Alignment 1 is bordered to the north by Williamson Act contracts between the intersection of Monte Road/Nashua Road and the Monterey Peninsula Recreational Trail and for approximately 1 mile to the east of the Monterey Recreational Trail as the alignment heads northward from Nashua Road. No crops are planted in Nashua Road or the recreational trail.

South of Reservation Road there are no Williamson Act contracts within or adjacent to the project area (CDC, 2016b).

4.16.2 Regulatory Framework

This section provides an overview of notable federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as “regulatory requirements”) relevant to agricultural resources. A brief summary of each is provided, along with a finding regarding the proposed project’s conformity with those regulatory requirements. The conformity findings concern the proposed project, without mitigation. Where the proposed project would be consistent with the applicable regulatory requirement, no further discussion of project consistency with that regulatory requirement is provided. Where the proposed project would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to a specific, detailed impact discussion within Section 4.16.5, Direct and Indirect Effects of the Proposed Project. Where applicable, the discussion in Section 4.16.5 identifies feasible mitigation that would resolve or minimize the potential inconsistency.

4.16.2.1 Federal Regulations

Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA; 7 USC §4201 et seq.) is intended to minimize the impact of Federal programs on the unnecessary and irreversible conversion of farmland to nonagricultural uses. The FPPA seeks to protect Prime Farmland, Unique Farmland, Farmland of Local Importance, and Farmland of Statewide Importance from irreversible conversion to non-agricultural use (7 USC §4201(c)(1)). Projects are subject to FPPA requirements if they would irreversibly convert farmland to nonagricultural use and are completed by a Federal agency or with assistance from a Federal agency. Projects subject to FPPA should consider alternative actions that could lessen any adverse effects and assure that such projects are compatible with State and local programs and policies created to protect farmland. The U.S. Department of Agriculture (USDA) is responsible for administering the FPPA (USDA, 2016).

Consistency with FPPA is relevant to the proposed project because portions of the project require various Federal permits, approvals, or authorizations, as described in Section 3.5, Permits, Approvals, and Regulatory Requirements. Furthermore, it would be funded, in part, by the State Revolving Fund program, a federal-state partnership that provides low-interest loans for investments in water and sanitation infrastructure. The proposed project would not be subject to FPPA requirements because the project would not irreversibly convert Prime Farmland, Unique Farmland, Farmland of Statewide Importance, or Farmland of Local Importance to nonagricultural use. See Impacts 4.16-1 and 4.16-2 for additional discussion.

4.16.2.2 State Regulations

California Land Conservation Act of 1965 (Williamson Act)

As described above, the California Land Conservation Act, or Williamson Act, is the State’s primary program for conserving private land for agricultural and open space use. It is a voluntary, locally administered program that offers reduced property taxes on lands whose owners place enforceable restrictions on land use through contracts between the individual landowners and local governments.

The proposed alignments for the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline would be potentially inconsistent with the Williamson Act because they would be located on lands protected by Williamson Act contracts. This issue is further discussed below in Impact 4.16-2.

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) provides for the long-term management of lands within California's coastal zone boundary. Of primary relevance to agricultural resources are Coastal Act policies concerning maintenance of agricultural lands in production and limitations on conversions of agricultural lands to non-agricultural uses. None of the MPWSP components subject to the Coastal Act is proposed on agricultural lands. Therefore, the MPWSP would not conflict with Coastal Act policies governing the productivity or conversion of agricultural.

4.16.2.3 Applicable Regional and Local Land Use Plans and Policies

Table 4.16-2 summarizes the regional and local land use plans, policies, and regulations pertaining to agriculture and indicates whether the proposed project is consistent with such plans, policies, and regulations. Where the analysis concludes the proposed project would be consistent with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes the proposed project is potentially inconsistent with the applicable plan, policy, or regulation, the reader is referred to the specific impact discussion in Section 4.16.5, Direct and Indirect Effects of the Proposed Project. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

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TABLE 4.16-2
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO AGRICULTURAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Agriculture	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, and Castroville Pipeline	***Policy AG-1.1:*** Land uses that would interfere with routine and ongoing agricultural operations on viable farmlands designated as Prime, of Statewide Importance, Unique, or of Local Importance shall be prohibited.	This policy is intended to protect agricultural operations on designated important farmlands from the loss of productivity as a result of incompatible land uses nearby.	<u>Consistent:</u> The proposed project would not introduce land uses that would interfere with routine and ongoing agricultural operations on viable farmlands. Although the proposed alignments for the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline would be installed within Farmland of Statewide Importance located on the north side of Charles Benson Road, impacts would be temporary and existing agricultural land uses could resume after pipeline installation is completed.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Agriculture	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, and Castroville Pipeline	***Policy AG-1.2:*** The County shall require that well-defined buffer areas be provided as partial mitigation for new non-agricultural development proposals that are located adjacent to agricultural land uses on farmlands designated as Prime, of Statewide Importance, Unique, or Local Importance.	This policy is intended to ensure that non-agricultural uses do not encroach on the agricultural lands.	<u>Consistent</u>: The proposed development on the MPWSP Desalination Plant site incorporates a 200-foot-wide buffer from the adjacent designated farmland located west of the site. Pipelines used for distribution of water are allowed in all zoning districts without a use permit and do not require a buffer provided they are buried at a sufficient depth to prevent conflicts with agricultural activities.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Agriculture	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, and Castroville Pipeline	***Policy AG-1.4:*** Viable agricultural land uses, including ancillary and support uses and facilities on farmland designated as Prime, of Statewide Importance, Unique, or of Local Importance shall be conserved, enhanced, and expanded through agricultural land use designations and encouragement of large lot agricultural zoning, except as provided in a Community Plan. Agriculture shall be established as the top land use priority for guiding further economic development on agricultural lands.	This policy is intended to preserve agricultural resources, protect prime agricultural soil, and deter conversion of farmland.	<u>Consistent</u>: The proposed project would not impede the viability, conservation, enhancement, or expansion of agricultural land uses. Although the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline would be installed in important farmland, impacts would be temporary and existing agricultural land uses could resume after pipeline installation is completed.
County of Monterey (coastal zone)	North County Land Use Plan	Agriculture	Source Water Pipeline and new Desalinated Water Pipeline	***Key Policy 2.6.1:*** The County shall support the permanent preservation of prime agricultural soils exclusively for agricultural use. The County shall also protect productive farmland not on prime soils if it meets State productivity criteria and does not contribute to degradation of water quality. Development adjacent to prime and productive farmland shall be planned to be compatible with agriculture.	This policy is intended to preserve agricultural resources, protect prime agricultural soils, and deter conversion of farmland.	<u>Consistent:</u> Pipeline installation would occur within roads or trails adjacent to, but outside of, agricultural lands. Therefore, the proposed project would not result in the permanent conversion of farmland to non-agricultural uses in areas within the North County Land Use Plan.
County of Monterey (coastal zone)	North County Land Use Plan	Agriculture	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.6.2.1:*** Prime and productive farmland designated for Agricultural Preservation and Agricultural Conservation land use shall be preserved for agricultural use to the fullest extent possible as consistent with the protection of environmentally sensitive habitats and the concentration of development.	This policy is intended to preserve farmland designated for Agricultural Preservation and Agricultural Conservation land use.	<u>Consistent:</u> Pipeline installation would occur within roads or trails adjacent to, but outside of, agricultural lands. Therefore, the proposed project would not result in the permanent conversion of farmland to non-agricultural uses in areas within the North County Land Use Plan.

SOURCE: Monterey County, 1999, 2010.

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4.16.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to agricultural resources if it would:

- Involve changes in the existing environment that, due to their location or nature, could result in the conversion of farmland to non-agricultural use;
- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use; or
- Conflict with existing zoning for agricultural use or with a Williamson Act contract.

4.16.4 Approach to Analysis

The analysis focuses on the potential for implementation of the proposed project to adversely affect agricultural resources through temporary disruption or disturbance of agricultural land uses and activities during construction, conversion of agricultural land to non-agricultural land uses during construction and operation, introduction of incompatible land uses or land use activities during operation, or through other changes to the physical environment that could result in loss or conversion of agricultural lands during construction and operation. Unless the land is zoned for agricultural uses, areas designated in the FMMP maps as Grazing Land are not considered in this analysis.

The approach is based largely on a comparison of the proposed project area, which is defined as the area within which all construction-related disturbance would occur, against important farmland as mapped in FMMP Important Farmland Series Maps, maps of Williamson Act contracts, and zoning maps. Existing use of land designated or zoned for agriculture was also considered. Since the project area encompasses all areas that would be disturbed, this analysis assumes that agricultural land that is adjacent to, but outside of, the project area boundary would not be subject to disturbance.

4.16.5 Direct and Indirect Effects of the Proposed Project

TABLE 4.16-3
SUMMARY OF IMPACTS – AGRICULTURAL RESOURCES

Impacts	Significance Determinations
Impact 4.16-1: Result in changes in the existing environment that, due to their location or nature, could temporarily disrupt agricultural activities or result in the permanent conversion of farmland to non-agricultural use.	LSM
Impact 4.16-2: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use.	LS
Impact 4.16-3: Conflict with zoning for agricultural uses or with Williamson Act contracts.	LS
Impact 4.16-C: Cumulative impacts related to agricultural resources.	LSM

NOTES:
LS = Less than Significant impact, no mitigation proposed
LSM = Less than Significant impact with Mitigation

4.16.5.1 Construction Impacts

Impact 4.16-1: Result in changes in the existing environment that, due to their location or nature, could temporarily disrupt agricultural activities or result in the permanent conversion of farmland to non-agricultural use. (*Less than Significant with Mitigation*)

This impact addresses the potential for construction of the proposed project to result in physical changes to the environment that could temporarily disrupt agricultural activities or result in the conversion of farmland and land zoned for agricultural uses to non-agricultural uses.

Project construction activities, if not properly managed, could temporarily displace or disrupt agricultural land uses, or cause long-term changes in the existing environment that could ultimately result in the conversion of farmland and land zoned for agricultural uses to non-agricultural uses. For example, project construction activities could temporarily interfere with existing agricultural operations, or cause soil compaction from the movement of heavy construction vehicles and equipment, thereby adversely affecting the suitability of soil for agricultural production. Excavation and earthmoving activities during project construction could also result in the loss of fertile topsoil and effectively render previously productive agricultural land unusable. Project components constructed within agricultural lands could convert farmland to non –agricultural uses.

As discussed above in Section 4.16.1, Setting/Affected Environment, portions of the project area are located within, or adjacent to, important farmland and land zoned for agricultural uses. As stated above in Section 4.16.4, given that the project area encompasses all areas that would be disturbed during construction, this analysis assumes that agricultural land that is adjacent to, but outside of, the project area boundary would not be subject to construction disturbance. As a result, this impact focuses on the project facilities within project area boundaries that would require construction on agricultural land or parcels that are zoned for agricultural land uses — MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, and Castroville Pipeline Optional Alignment 1.

MPWSP Desalination Plant

The MPWSP Desalination Plant would be located on 25 acres of land zoned for Permanent Grazing and designated as Grazing Land by the FMMP. The land has not been used for grazing or any other agricultural purpose since at least 1956 (RBF Consulting, 2012). Therefore, construction of the MPWSP Desalination Plant would not temporarily disrupt agricultural activities, as none currently are conducted on the site, and would have a less-than-significant impact with respect to conversion of land zoned for agricultural use to non-agricultural uses because no agricultural uses currently are present in this location.

Source Water Pipeline, New Desalinated Water Pipeline, and Castroville Pipeline

Construction activities associated with the installation of the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline would require surface disturbance and earthmoving activities within or near farmland in the following locations:

- The 4,000-foot segments of the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline located north of, and outside of, the Charles Benson Road paved roadway would be installed within designated farmland that is also zoned as Permanent Grazing; however, 2,500 feet (0.5 mile) of this stretch is private agricultural land currently under flower production.
- 2.4 miles of the Castroville Pipeline, between the Salinas River and the Tembladero Slough, would be installed in Monte Road and an unpaved agricultural road. This area is mapped as important farmland but crops are not grown in the roadway. Construction disturbance associated with the Castroville Pipeline would be confined to the road and road shoulder.
- Approximately 950 feet of the Castroville Optional Alignment 1 along Nashua Road is mapped as being within farmland but construction disturbance would be limited to the road and road shoulder and would not affect cultivated row crops.
- 1,900 feet of the Castroville Optional Alignment 1 along the Monterey Peninsula Recreational Trail and east of Highway 1 is also mapped as farmland but crops are not grown in the trail. Pipeline installation activities would be installed within and adjacent to the recreational trail and would not affect cultivated row crops.

Pipeline installation and earthmoving activities associated with the segments of the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline north of Charles Benson Road that would be installed in land zoned for Permanent Grazing would involve temporary construction impacts that would not persist after construction is completed and the construction site is restored. The pipeline installation and earthmoving activities associated with the 0.5-mile-long segments of the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline north of Charles Benson Road that are within cultivated farmland could result in the loss of topsoil and/or soil compaction and ultimately reduce agricultural productivity, a potentially significant impact. However, the impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.16-1 (Minimize Disturbance to Farmland)**. No impact would occur with any other segments of the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline or with the Castroville Optional Alignments 1 and 2.

All Other Proposed Facilities

Although other pipeline alignments north of Reservation Road border farmland, construction of these pipelines would not result in the disturbance of farmland because the disturbance would be contained within the project area boundary, which is outside of farmland. None of the proposed facilities located south of Reservation Road are located in close proximity to farmland. Therefore, construction of these facilities would not affect soil conditions in farmland areas and would not result in the conversion of farmland to non-agricultural uses. No impact would result.

Consistency with Regulatory Requirements

Due to the potential for installation of the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline north of Charles Benson Road to result in the conversion of farmland to non-agricultural uses, these pipelines are considered to be potentially inconsistent with applicable regulatory requirements related to agricultural resources that were adopted for the purposes of avoiding or mitigating an environmental effect, namely, the FPPA (described in Section 4.16.2.1, above). The 0.5-mile-long segments of the Source Water Pipeline, new

Desalinated Water Pipeline, and Castroville Pipeline that would be installed in the farmland north of Charles Benson Road would potentially conflict with the FPPA, which intends to protect farmland from being irreversibly converted to nonagricultural uses. However, CalAm and its construction contractors would be required to implement **Mitigation Measure 4.16-1 (Minimize Disturbance to Farmland)**, which would resolve any potential conflicts with the FPPA.

Impact Conclusion

Construction of the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline north of Charles Benson Road would cause physical changes to the environment that could result in the conversion of farmland to non-agricultural uses, a significant impact. Implementation of **Mitigation Measure 4.16-1 (Minimize Disturbance to Farmland)** would reduce this impact to a less-than-significant level. None of the other proposed facilities or pipeline alignments would result in conversion of farmland.

Mitigation Measures

Mitigation Measure 4.16-1 applies to the proposed alignments of the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline north of Charles Benson Road.

Mitigation Measure 4.16-1: Minimize Disturbance to Farmland.

CalAm and its construction contractor(s) shall incorporate the following measures into construction plans and specifications for all construction activities located in farmland areas to minimize adverse impacts on farmland:

- CalAm shall notify affected property owners at least 90 days prior to initiating construction activities that have the potential to interfere with agricultural operations.
- Construction contractor(s) shall minimize the extent of the construction disturbance, including construction access, in agricultural areas to the maximum extent feasible. Minimization efforts shall include, but not be limited to, consulting with affected property owners to schedule construction activities to minimize impacts during planting, growing, and/or harvest seasons.
- During excavation and other earthmoving activities in designated farmland areas, the surface and subsurface soil layers shall be stockpiled separately when trenches are excavated. Segregated topsoil and subsoil shall be maintained and kept separated throughout all construction activities, and these soils shall subsequently be used to backfill excavations and shall be returned to its appropriate location in the soil profile.
- To avoid over-compaction of the top layers of soil, soil densities shall be measured prior to the start of construction activities, and surface soil (roughly the upper 3 feet of soil) shall be backfilled to within 5 percent of the original density.
- If necessary, following construction activities, the uppermost 3 feet of soil shall be ripped to achieve the appropriate soil density (within 5 percent of the original). Ripping may also be used in areas where vehicle and equipment traffic has compacted the topsoil layers.
- Existing agricultural drainage systems shall be inspected before and after construction to ensure they function as needed.

- Disturbed areas shall be restored to pre-construction conditions following construction.

4.16.5.2 Operational and Facility Siting Impacts

Impact 4.16-2: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use. (*Less than Significant*)

This impact is related to the long-term conversion or loss of important farmlands. As discussed above in Section 4.16.1, Setting/Affected Environment, the FMMP Important Farmland Maps for Monterey County indicate that portions of the project area are located within, or adjacent to, lands designated as Prime Farmland and Farmland of Statewide Importance. Since the project area was designed to encompass all construction-related disturbances, no disturbance to land located outside of the project area is anticipated.

MPWSP Desalination Plant

As indicated in Section 4.16.1.1, above, approximately 1.7 acres of the northern portion of the larger 46-acre MPWSP Desalination Plant parcel are designated as Prime Farmland. However, the proposed desalination facilities would be constructed on the 25-acre MPWSP Desalination Plant site on the upper terrace of the parcel and outside of the area designated as Prime Farmland. Farmland of Statewide Importance exists west of the MPWSP Desalination Plant site. However, because the plant footprint would neither extend into the approximately 1.7 acre area nor outside of the project area boundary and into this adjacent parcel, no impact would result.

Source Water Pipeline, New Desalinated Water Pipeline, Castroville Pipeline

As described above in Section 4.16.1 and Impact 4.16-1, portions of the Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline north of Charles Benson road would be installed in designated important farmland. Portions of the Castroville Pipeline Optional Alignment 1 would be installed along right-of-ways or trails that are mapped as farmland but have no crops grown within them.

- The 2,500-foot-long (0.5-mile) segments of the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline would be installed in Farmland of Statewide Importance along the north side of Charles Benson Road. CalAm plans to negotiate an easement along the north side of the existing row of eucalyptus and cypress trees that line Charles Benson Road for this purpose. This easement could encompass up to 3 acres of Farmland of Statewide Importance. The affected farmland is currently used for flower cultivation.
- Approximately 2.4 miles of the Castroville Pipeline alignment between the Salinas River and the Tembladero Slough is mapped Prime Farmland and Farmland of Statewide Importance. This section of pipeline would be installed in Monte Road and the private dirt agricultural road along the edge of the cultivated rows and would not convert designated farmland to non-agricultural use.
- Approximately 950 feet of the Castroville Pipeline Optional Alignment 1 along Nashua Road, and 1,900 feet of the Castroville Pipeline Optional Alignment 1 along Highway 156

and the Monterey Peninsula Recreational Trail, south of Tembladero Slough, is mapped as Prime Farmland. These pipeline sections would be installed in Nashua Road and the recreational trail along the edge of the cultivated rows and would not convert designated farmland to non-agricultural use.

In summary, only the 2,500-foot segments of the pipelines along the north side of Charles Benson Road would be installed within farmland. Pipelines would be buried at a minimum depth of 4 feet below the ground surface, which would avoid conflicts with typical tillage activities. As a result, agricultural production on land currently used for the cultivation of flowers could resume after pipeline construction has been completed. While the presence of these pipelines would prevent the future cultivation of large woody plants and trees along the pipeline corridors (woody plant types can damage pipelines and interfere with pipeline repairs and maintenance), such plant types are not currently or typically grown in the potentially affected agricultural areas; therefore, this limitation would result in a less-than-significant impact within the 3 or fewer acres of farmland affected, and would not result in the conversion of this farmland to non-agricultural uses.

If selected, the optional alignments for the Source Water Pipeline and new Desalinated Water Pipeline, and the Castroville Pipeline Optional Alignment 2, would be installed within the Charles Benson Road paved roadway and would avoid the Farmland of Statewide Importance located along the north side of Charles Benson Road. Implementation of these optional alignments would have no impact, and would eliminate the impact of the proposed alignments on the 3 acres of farmland described above.

All Other Facilities

None of the other facilities north of Reservation Road would be installed in areas mapped as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. South of Reservation Road, land uses in the project area are predominantly urban and do not include important farmland. Thus, no impact related to the conversion of important farmland to non-agricultural uses would result from implementation of all other proposed facilities. Impacts on agricultural production wells resulting from operation of the slant wells at CEMEX, are discussed in Groundwater, Section 4.4.5.2, Operations Impacts and Mitigation Measures.

Impact Conclusion

Implementation of the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline installed in the farmland north of Charles Benson Road would result in a less-than-significant impact related to the permanent conversion of important farmland to non-agricultural uses; farming practices would not be displaced. Alternately, implementation of the optional alignments for the Source Water Pipeline and new Desalinated Water Pipeline, and the Castroville Pipeline Optional Alignment 2 would eliminate the less-than-significant impact (no impact). For all other facilities, no impact would result.

Impacts 4.4-3 and 4.4-4 in Section 4.4, Groundwater Resources, describe the potential impacts on groundwater quality and quantity due to operation of the proposed project. As described therein, the proposed project would result in less-than-significant impacts on groundwater quality and levels. That analysis identifies less-than-significant impacts on existing users of wells that may be affected by the proposed project, including agricultural users. Because the proposed project would not affect groundwater quality or levels in a way that would adversely affect existing agricultural users, it would not result in a change in the existing environment that would indirectly result in the permanent conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use.

Mitigation Measures

None proposed.

Impact 4.16-3: Conflict with zoning for agricultural uses or with Williamson Act contracts. (*Less than Significant*)

Some of the proposed facilities and pipelines located north of Reservation Road would be constructed on lands under Williamson Act contract and lands zoned for agricultural uses. The proposed project could result in zoning conflicts if it were to introduce incompatible land uses into these areas or cancel or displace Williamson Act land. Land protected by Williamson Act contracts is shown in **Figures 4.16-1** and **4.16-2**. The facilities that would be installed within land zoned for agriculture are shown in **Table 4.16-4**, below. In general, zoning designations do not extend into the road right-of-ways.

TABLE 4.16-4
PROJECT FACILITIES PROPOSED ON LAND ZONED FOR AGRICULTURE

Facility Name	Current Land Use	Location Where Facility Would Be Sited in Agricultural Zoning	Zoning
MPWSP Desalination Plant	Vacant/undeveloped	25-acre upper terrace (proposed development area)	Permanent Grazing – Permanent Grazing
Source Water Pipeline, New Desalinated Water Pipeline, Castroville Pipeline	Vacant/undeveloped and flower cultivation	4,000-foot segment located along the north side of Charles Benson Road between MPWSP Desalination Plant site and Del Monte Boulevard	Permanent Grazing – Permanent Grazing

MPWSP Desalination Plant

Current and recent uses of a property can provide a practical measure of its suitability for agriculture. The 46-acre MPWSP Desalination Plant parcel is zoned for Permanent Grazing, but with the exception of the unconnected 1.7 acres of this parcel that form a portion of a neighboring farm and which would not be affected by the proposed project, the property has not been used for grazing or any other agricultural use since at least 1956 (RBF Consulting, 2012). Section 21.34.050 of the Monterey County Zoning Ordinance allows for public and quasi-public land uses including public utilities on land zoned for Permanent Grazing (Monterey County, 2011). Therefore, the proposed development of the 25-acre upper terrace of the parcel for the MPWSP Desalination Plant site would be allowed with a use permit from Monterey County. The 200-foot buffer between farmland and new development that is required by the Monterey County Municipal Code has been accounted for in the preliminary site plan for the MPWSP Desalination Plant (see

Figure 3-5b in Chapter 3, Description of the Proposed Project. Therefore, the proposed desalination facilities on the upper terrace would not conflict with the existing zoning for agricultural uses.

The MPWSP Desalination Plant site is not under a Williamson Act contract. The Williamson Act lands located west of the site would not be affected by the proposed desalination facilities.

Source Water Pipeline, New Desalinated Water Pipeline, and Castroville Pipeline

The 4,000-foot-long (0.75-mile) segments of the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline that would be installed along the north side of Charles Benson Road, outside of the paved roadway, would be installed in land zoned for Permanent Grazing. However, Section 21.64.160 of the Monterey County Zoning Ordinance allows underground public utilities in all zoning districts, without the necessity of obtaining a use permit. Therefore, no conflict with agricultural zoning would occur.

The following segments of the Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, and Castroville Pipeline Optional Alignment 1 would be installed in land protected by Williamson Act contracts:

- Approximately 0.10 mile within the CEMEX access road west of Highway 1 (Source Water Pipeline).
- Approximately 0.5 mile along the north side of Charles Benson Road (Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline).
- Approximately 0.5 mile of the section of Castroville Pipeline that would be installed in the dirt agricultural road located north of Monte Road/Nashua Road.

Pipeline installation in Williamson Act lands would not result in the cancellation of Williamson Act contracts nor permanently interfere with the ongoing use of the land for agricultural purposes because the existing uses, none of which include the cultivation of woody plants or trees, could resume once construction of the pertinent pipeline segments has been completed. Therefore, impacts would be less than significant.

As discussed in Section 4.16.4, agricultural land that is adjacent to, but outside of the project area boundary would not be subject to disturbance, therefore the Castroville Pipeline and Castroville Pipeline Optional Alignment 1 routes that run adjacent to land protected by Williamson Act contracts would have no conflict.

Since the Source Water Pipeline Optional Alignment, new Desalinated Water Pipeline Optional Alignment, and Castroville Pipeline Optional Alignment 2 would be installed within the paved roadway of Charles Benson Road, implementation of these optional alignments would have no impact on Williamson Act lands.

All Other Proposed Facilities

None of the other proposed facilities would be located within, or adjacent to, land zoned for agriculture or land protected by Williamson Act contracts. Therefore, no conflict would result.

Impact Conclusion

None of the proposed facilities would conflict with agricultural zoning. The Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline installed in farmland north of Charles Benson Road would result in a less than significant impact related to conflicts with Williamson Act contracts because existing uses could resume during operations. All other proposed facilities, including all optional pipeline alignments, would have no impact on Williamson Act land.

Mitigation Measures

None proposed.

4.16.6 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects.

Impact 4.16-C: Cumulative impacts related to agricultural resources *(Less than significant with Mitigation)*

The scope for cumulative impacts on agricultural resources encompasses the geographic extent of the California Department of Conservation's FMMP maps for Monterey County and local zoning maps for Monterey County. The timeframe during which the MPWSP could contribute to cumulative agricultural resources effects includes the 24-month construction phase. Cumulatively significant impacts on agricultural resources could result if incremental effects of the MPWSP combined with those of one or more additional projects to cause substantial permanent conversion of designated important farmland (e.g., Prime Farmland, Unique Farmland, or Farmland of Statewide Importance) to non-agricultural use, conflict with existing zoning for agricultural uses or with Williamson Act contracts, or otherwise change the existing environment such that farmland is converted to non-agricultural use (see **Table 4.16-3, Summary of Impacts – Agricultural Resources**).

Projects identified in **Table 4.1-2** in Section 4.1 that could affect agricultural lands include the Regional Urban Water Augmentation Project (RUWAP) Recycled Water Project (No. 35) and the Monterey Peninsula Light Rail Project (MPLRP) (No. 38).

Cumulative Construction Impacts

As described in Impact 4.16-1, the proposed project would temporarily disrupt agricultural uses along the north side of Charles Benson Road, and construction activities could result in the loss of topsoil and soil compaction that could reduce agricultural productivity. The RUWAP Recycled Water Project and the MPLRP also would have short-term construction-related effects that could result in the conversion of agricultural land to non-agricultural uses. The RUWAP Recycled Water Project would temporarily affect a 0.75-mile-long (4-acre) band of Farmland of Statewide Importance and Grazing as a result of construction staging and use of heavy equipment during pipeline installation from the pump station. Following construction, this project would return the ground surface to its original condition (Denise Duffy & Associates, 2007) Phase 2 of the MPLRP would result in short-term disturbance of agricultural activities during construction. These projects' impacts could combine to result in a significant cumulative impact.

Each project enlists specific design features (i.e., avoidance) and/or mitigation measures that would reduce construction impacts on agricultural uses. The RUWAP Recycled Water Project proposes to avoid existing row crop production. The short-term construction impacts on agricultural land associated with Phase 2 of the MPLRP would be mitigated through consultation with government agencies and TAMC leaseholders, development of a construction schedule that avoids conflict with the growing season, and construction equipment staging in areas that avoid active agricultural production (TAMC, 2011). As discussed in Section 4.16.5, above, after implementation of **Mitigation Measure 4.16-1 (Minimize Disturbance to Farmland)**, installation of the proposed alignments of the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline north of Charles Benson Road would result in a less-than-significant impact related to the loss of topsoil and/or soil compaction potentially resulting in reduced agricultural productivity and conversion of agricultural land. This mitigation measure would minimize the extent of construction disturbance in agricultural areas, require stockpiling and restoration of topsoil and subsoil layers, backfill and restoration of excavated soils to appropriate densities, and maintenance of functioning agricultural drainage systems (Impact 4.16-1). These effects would be temporary and limited to the MPWSP construction period, and residual impacts on agricultural land following implementation of this mitigation measure would be minimal. No conversion of agricultural land is anticipated as a result of this impact after mitigation. Because the residual construction-related impacts on agricultural land would not cause conversion of these lands to non-agricultural use, with mitigation, the proposed project would have a less than significant contribution to a significant cumulative impact related to temporary disturbance or other changes in the environment that could result in the conversion of farmland to non-agricultural uses.

Cumulative Impacts During Project Operations

As described in Section 4.16.5.2, above, project operations would not result in the conversion of Prime Farmland, Farmland of Statewide Importance, or Unique Farmland to non-agricultural use (Impact 4.16-2). Therefore, regardless of the impacts of other projects in the cumulative scenario, project operation would have a less than significant contribution to a cumulative impact related to farmland conversion.

The operation of the MPWSP Desalination Plant would permanently occupy 25 acres of land zoned for Permanent Grazing, and a 4,000-foot segment of the Source Water Pipeline, New Desalinated Water Pipeline, and Castroville Pipeline north of Charles Benson Road would be located within land zoned Permanent Grazing (Impact 4.16-3). As previously noted, public utilities and water system facilities are allowed in the Permanent Grazing district with a use permit, and underground utility uses are allowed in all zones. Therefore, the project would not conflict with zoning for agricultural uses, and would not contribute to a cumulative impact related to agricultural zoning. Additionally, several pipeline segments would be installed within lands protected by Williamson Act contracts as described in Impact 4.16-3. However, these uses would not permanently affect the existing agricultural uses in these locations and thus would not conflict with a Williamson Act contract. Therefore, regardless of the impacts of other projects in the cumulative scenario, project operation would have a less than significant contribution to a cumulative impact on Williamson Act lands.

Mitigation Measures

None proposed.

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4.17 Mineral Resources

Sections	Tables

This section describes existing mineral resources in the vicinity of the Monterey Peninsula Water Supply Project (MPWSP or proposed project) and analyzes the potential effects of construction and operation of the proposed project on these resources. Sand is the largest known and valuable mineral resource in the region, and is the focus of this section. Other minerals such as oil and gas are present in the region, but are not present within the project area.

Comments received on the 2015 Draft EIR requested that construction of the subsurface slant wells and source water pipeline on CEMEX property be accounted for and addressed in a reclamation plan amendment pursuant to the Surface and Mining Reclamation Act; the comment is addressed in Section 4.17.1.2. In addition, comments requested clarity about the impact of maintenance activities associated with the slant wells, which the commenter assumed would be in the active mining area. Since the slant wells would be in the retired portion of the CEMEX property, this comment is moot. A comment also requested information about the suitability and likelihood of future mining in the area of the ASR Wells, and why the ASR Wells would not preclude mining activities in this area; the comment is addressed in Section 4.17.5.1.

4.17.1 Setting/Affected Environment

The study area for evaluation of impacts on mineral resources includes the project area boundary (see Figures 3-3 through 3-16) and the general vicinity of the proposed project, within coastal northern Monterey County. MBNMS resources that would be affected by impacts identified in this section are limited to the seafloor and subsurface materials (e.g., sand, sediments) within MBNMS above the ends of the slant wells; all other impacts related to mineral resources would occur outside of MBNMS boundaries.

4.17.1.1 Mineral Resources

In accordance with California's Surface Mining and Reclamation Act of 1975 (SMARA) (discussed in Section 4.17.2.2, below), the state geologist, through the California Department of Conservation, California Geological Survey (CGS; formerly known as the California Division of Mines and Geology [CDMG]), is responsible for identifying and mapping the non-fuel mineral resources of the state. Economically significant mineral deposits are classified based on the known and inferred mineral resource potential of the land using the California Mineral Land Classification System, which includes the following four mineral resource zones (MRZs).

- ***MRZ-1*****:** Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
- ***MRZ-2:*** Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.
- ***MRZ-3:*** Areas containing mineral deposits, the significance of which cannot be evaluated.
- ***MRZ-4:*** Areas where available information is inadequate for assignment to any other zone.

The CGS's classification of lands in the Monterey Bay Production–Consumption Region,[1] within which the proposed project is located, focuses on significant sand, gravel, or stone deposits that are suitable as sources of aggregate (CDMG, 1987). Construction-grade aggregate is used in construction to provide bulk and strength to concrete, plasters, and stucco, and is used in road construction and other building applications. The CGS estimates that the Monterey Bay Production–Consumption Region has 323 million tons of permitted aggregate reserves.[2] The estimated 50-year demand for aggregate in the region is 346 million tons (CGS, 2012).

A large portion of the study area is classified as MRZ-2 due to the presence of significant sand and gravel deposits (CDMG, 1987). The MRZ-2 within the study area extends from the Salinas River in the north to Highway 68 in the south, and from the Pacific coast to inland areas east of General Jim Moore Boulevard. Project components that would be located in MRZ-2 include the slant wells, the Source Water Pipeline, the MPWSP Desalination Plant, the Brine Discharge Pipeline, the Brine Mixing Box, the Pipeline to CSIP Pond, the new Desalinated Water Pipeline, the southern portion of the Castroville Pipeline, the new Transmission Main, the ASR conveyance pipelines, the ASR-5 and ASR-6 Wells, and the Ryan Ranch-Bishop Interconnection Improvements. North of the Salinas River, portions of the proposed and alternate Castroville Pipeline routes are located within MRZ-1 and MRZ-4. The Main System–Hidden Hills Interconnection Improvements, and the Carmel Valley Pump Station would not be located within an MRZ (CDMG, 1987).

4.17.1.2 Mining Operations

The only remaining active mining operation in the project area is the CEMEX sand mining facility located on the coast in north Marina, within the Marina Dune Complex (City of Marina, 1982). The Marina General Plan recognizes this facility being located within a designated mineral resource, but does not contain policies protecting or promoting mineral resource extraction at this site (City of Marina, 2006). The northern portion of the Marina Dune Complex is undisturbed but the southern portion has been affected by ongoing sand mining activities at the CEMEX facility, which has been in operation since 1906. Sand deposits at the CEMEX sand mining facility, also known as the Lapis #110 Pit, the Lapis Sand Pit, and the Lapis Plant, include beach sands and eolian dunes (USGS, 2016; RMC Lonestar, 1989).

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1 A production-consumption region consists of one or more aggregate-producing districts and the market area they serve.

2 Permitted aggregate reserves are aggregate deposits that have been determined to be acceptable for commercial use, and that exist within properties owned or leased by aggregate-producing companies that have permits authorizing the mining of these aggregate materials.

CEMEX operators use a floating suction dredge to extract beach sand from a dredging pond located on the western portion of the CEMEX facility (see Figure 3-3a). Although a beach berm provides some separation between the dredging pond and Monterey Bay, the pond receives surface flow from the Monterey Bay during incoming tides and storm events and is replenished by sand that washes over the berm (PWA, 2008). The dredging pond is continuously being filled with sand and this sand is dredged by CEMEX facility operators. Mining operators pump the dredged sand through a feedpipe to processing facilities located in the eastern portion of the CEMEX facility. CEMEX also operates several settling ponds located south of the dredging pond and north of the CEMEX access road. As described in Section 3.2.1 of Chapter 3, Description of the Proposed Project, and depicted in **Figure 3-3**, the proposed subsurface slant wells would be located south of the CEMEX access road in the southern portion of the CEMEX property. Active sand mining operations no longer occur in the southern portion of the CEMEX property, and this area is retired and under reclamation (Ron Wilson, CEMEX Land Manager, personal communication, August 3, 2016). If the proposed project is implemented, CEMEX, as the land owner, would need to amend the Reclamation Plan to include the construction and operation of the slant wells in the retired portion of CEMEX property and the source water pipeline underneath the CEMEX access road.

According to the Lapis Plant Reclamation Plan approved in 1991 and mine inspection reports conducted by the California State Mining and Geology Board, Phase I revegetation and recontouring measures have been carried out along the slopes of the southern portion of the CEMEX property, while Phase II reclamation plans call for revegetation of the northeastern slope once mining operations have ceased (RMC Lonestar, 1989; CSGMB, 2016). At the conclusion of mining operations, the Reclamation Plan proposes that the land would be available for coastal uses allowed by the Marina Coastal Zone Land Use Plan once regrading, recontouring, revegetation, and slope stabilization efforts are complete or underway (RMC Lonestar, 1989).

CEMEX personnel continue to conduct vegetative reclamation activities in the southern portion of the CEMEX property, and CEMEX would continue to be responsible for reclamation activities as long as the property is still owned by CEMEX (Tony Lombardo, Attorney at Law, personal communication, August 3, 2016; Ron Wilson, CEMEX Land Manager, personal communication, August 3, 2016). However, under SMARA, CEMEX is required to provide financial assurance that guarantees a funding mechanism for reclamation in case the mine site is abandoned or the operator becomes financially insolvent (CSMGB, 2004). The latest financial assurance was approved by the California State Mining and Geology Board in 2016 (CSMGB, 2016).

Although the Reclamation Plan states that the CEMEX mining site could operate for 50 years or more, from the time the plan was written in 1989 (RMC Lonestar, 1989), the legality of sand mining activities at the CEMEX site has been under review by state and federal agencies. On March 17, 2016, the California Coastal Commission (CCC) issued a Notice of Intent to Commence a Cease and Desist Order (NOI) to CEMEX property owners. The NOI instructed them to shut down mining operations due to the lack of proper coastal development permits and several other violations of the Coastal Act regarding sensitive dune habitat in the vicinity of the active mining operations and coastal access (Monterey County Weekly, 2016). In addition, on April 21, 2016, the MBNMS Sanctuary Advisory Council sent a letter to the Acting Director of the National Oceanic and Atmospheric Administration Office of National Marine Sanctuaries (MBNMS SAC, 2016) seeking a resolution that would decrease or cease active mining at the CEMEX property, due to the possible taking of a sanctuary resource and/or possible violation of MBNMS regulations. Subsequently, CalAm, the CCC, the California State Lands Commission, and the City of Marina signed the Consent Settlement Agreement and Cease and Desist Order No. CCC-17-CD-02 in July 2017 that requires the complete removal of all sand mining structures and operational machinery, and the restoration of all areas affected by the Lapis sand mining operations by December 31, 2020. Before that end date, CEMEX may not extract more than 720,000 tons of sand in total from the site and may not extract more than 240,000 tons of sand from the site in any calendar year (CCC, 2017). The Removal Plan and the aforementioned Reclamation Plan are identified in Table 4.1-2 as a potential project considered in the cumulative analysis (see project No. 63, CEMEX Removal Plan and Reclamation Plan) (CCC, 2017).

4.17.1.3 Oil, Gas, and Geothermal Wells

According to the Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR), there are three plugged oil or gas wells in the project vicinity. DOGGR shows the status of the three wells, which are located in the cities of Seaside, Sand City, and Del Rey Oak, as "plugged," and the status of the well operators as "inactive" (DOGGR, 2016). These wells are not located within the project area.

4.17.2 Regulatory Framework

This section provides an overview of federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as "regulatory requirements") relevant to mineral resources, and analyses of the proposed project's conformity with such regulatory requirements, without mitigation.

4.17.2.1 Federal Regulations

There are no federal regulations that pertain to mineral resources that are applicable to the proposed project.

4.17.2.2 State Regulations

Surface Mining and Reclamation Act of 1975

SMARA (CCR, Title 14, Division 2, Chapter 8, Subchapter 1) requires the State Mining and Geology Board (SMGB) to adopt state policies that regulate the operation of surface mines, the reclamation of mined lands, and the conservation of mineral resources. In accordance with SMARA, the State of California established the Mineral Land Classification System to help identify and protect mineral resources in areas that are subject to urban expansion or other irreversible land uses that would preclude mineral extraction. Protected mineral resources include construction materials, industrial and chemical mineral materials, metallic and rare minerals, and non-fluid mineral fuels.

The MPWSP would be consistent with SMARA as the proposed project would not preclude reclamation of mined lands, would not limit mining potential in the Monterey Bay Production – Consumption Region, and would not interfere with existing mining operations.

4.17.2.3 Applicable Regional and Local Land Use Plans, Policies, and Regulations

To evaluate project consistency with applicable regulatory requirements related to land use, **Table 4.17-1** identifies the regional and local land use plans, policies, and regulations pertaining to mineral resources that are relevant to the MPWSP that were adopted for the purpose of avoiding or mitigating an environmental effect, and indicates project consistency with such plans, policies, and regulations. As shown in the table, the proposed project would not conflict with any applicable plan, policy, or regulation.

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TABLE 4.17-1
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO MINERAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone)	City of Marina General Plan	Community Design and Development	Subsurface Slant Wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.124:*** To conserve soil and mineral resources within the Marina Planning Area, the following policies and conditions shall be established: 4. The City recognizes the presence of designated mineral resources west of Highway 1, and shall continue to allow the existing sand-mining operation on RMC Lonestar property [now known as the CEMEX sand mining facility] west of Highway 1 in accordance with the provisions of Marina's local coastal plan (LCP) and the approved Reclamation Plan for that site. In accordance with the Marina LCP, new or expanded sand-mining operations shall be limited to the surf zone and already-disturbed areas, and shall be subject to completion and approval of the prerequisite environmental review, Reclamation Plan, and coastal permit process.	This policy is intended to ensure that new or expanded mining operations are protective of coastal sediments and biological resources.	Consistent: The proposed project does not propose any new or expanded mining operations.
County of Monterey (coastal zone & inland area)	Monterey County Code	Chapter 16.04 - Surface Mining and Reclamation	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Chapter 16.04 - Surface Mining and Reclamation*** recognizes that mineral extraction is essential to the economic well-being of the county and that reclamation of the mined lands is necessary to prevent or minimize adverse effect on the environment and to protect public health and safety. The purpose of Chapter 16.04 is to ensure the continued availability of important mineral resources while regulating surface mining operations as required by SMARA.	This section is intended to provide for continued mining and mined lands reclamation, consistent with public health and safety needs.	Consistent: The proposed project would not substantially limit opportunities to extract mineral resources or preclude reclamation of mined lands within unincorporated areas of Monterey County.
County of Monterey (coastal zone & inland area)	Monterey County Code	Chapter 16.04 - Surface Mining and Reclamation	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Section 16.04.140 - Mineral Resource Protection*** protects mineral resource areas that have been classified by the CDMG or designated by the SMGB, as well as existing surface mining operations that remain in compliance with the provisions of Chapter 16.04, from intrusion by incompatible land uses that may impede or preclude mineral extraction or processing, to the extent possible while remaining consistent with the Monterey County General Plan.	This section is intended to protect lands identified as having high mineral resource potential, as well as existing mining operations from encroachment by incompatible land uses that may preclude mining activities.	Consistent: The proposed project does not propose any land uses that would preclude present or future mining of lands designated as having high mineral resource potential or existing mining operations within unincorporated Monterey County.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-2.1:*** Potentially significant mineral deposits and existing mining operations identified through the State Division of Mines and Geology, including idle and reserve properties, shall be protected from on-site and off-site land uses that would be incompatible with mineral extraction activities.	This section is intended to protect lands identified as having high mineral resource potential, as well as existing mining operations from encroachment by incompatible land uses that may preclude mining activities.	Consistent: The proposed project does not propose any land uses that would preclude present or future mining of lands designated as having high mineral resource potential or existing mining operations within unincorporated Monterey County.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-2.3:*** Efforts to conserve raw mineral resources through recycling shall be supported.	This policy is intended conserve raw mineral resources.	Consistent: As discussed in Section 4.13, Public Services and Utilities, Monterey County requires that 50 percent of inert solids and 100 percent of non-inert materials be diverted from landfills. The proposed project would also be required to comply with State regulations requiring waste diversion and recycling. Therefore the proposed project would be consistent with this policy.

TABLE 4.17-1 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO MINERAL RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-2.5:*** The County shall inventory, assess, and characterize the location and condition of identified pre-SMARA abandoned gold, mercury and coal mines and implement such measures as may be necessary to ensure that such mines do not contribute to a significant risk to public health or safety or non-compliance with water quality standards and criteria.	This policy is intended to ensure that abandoned mines do not create a significant health risk to people or water quality.	<u>Consistent:</u> The proposed project would not be located with an abandoned mine or otherwise contribute to an abandoned mine's public health or safety risk, or violation of water quality standards.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline	***Soils and Geology Policy B-2:*** The City shall protect designated mineral resource protection areas from incompatible land uses.	This section is intended to protect lands identified as having high mineral resource potential from encroachment by incompatible land uses that may preclude mining activities.	<u>Consistent:</u> The project does not propose any land uses that would preclude present or future mining of designated mineral resource protection areas within former Fort Ord lands.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Soils and Geology Policy B-2:*** The County shall protect designated mineral resource protection areas from incompatible land uses.	This section is intended to protect lands identified as having high mineral resource potential from encroachment by incompatible land uses that may preclude mining activities.	<u>Consistent:</u> The project does not propose any land uses that would preclude present or future mining of designated mineral resource protection areas within former Fort Ord lands.

SOURCE: City of Marina, 2006; FORA, 1997; Monterey County, 2010.

4.17.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to mineral resources if it would:

- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or
- Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

4.17.4 Approach to Analysis

This impact analysis evaluates the potential for the proposed project to result in the loss of availability of locally or regionally important mineral resources based on mineral resource maps prepared by the CGS using the California Mineral Land Classification System, and mineral resource maps produced by Monterey County and the City of Marina. Impacts related to the loss of mineral resources would be considered significant if construction activities were to disrupt active mining activities and make known mineral resources unavailable, or if siting of new facilities were to preclude the future recovery of known mineral resources or adversely affect the availability of these resources for future recovery.

All potential impacts related to mineral resources are associated with project construction and/or facility siting; no impacts would result from project operations. Therefore, the evaluation presented below only considers impacts related to construction and facility siting.

4.17.5 Direct and Indirect Effects of the Proposed Project

Table 4.17-2 summarizes the proposed project's impacts and significance determinations related to mineral resources.

TABLE 4.17-2
SUMMARY OF IMPACTS – MINERAL RESOURCES

Impacts	Significance Determinations
Impact 4.17-1: Loss of availability of known mineral resources that are of value to the region or residents of the state, or result in the loss of a locally-recognized important mineral resource recovery site.	LS
Impact 4.17-C: Cumulative impacts related to mineral resources.	LS

NOTES:
LS = Less than Significant impact, no mitigation proposed

4.17.5.1 Construction and Facility Siting Impacts

Impact 4.17-1: Loss of availability of known mineral resources or locally important mineral resource recovery sites. ***(Less than Significant)***

All proposed project components north of Highway 68 and south of the Salinas River would be located in areas designated as MRZ-2 – that is, areas where adequate information indicates that significant mineral deposits (in this case, sand for use as aggregate) are either present or are likely to be present. The CEMEX sand mining facility is within the MRZ-2 designation. There are no locally important mineral resource sites delineated on a local general plan, specific plan, or other land use plan in the study area.

Subsurface Slant Wells and Source Water Pipeline

The subsurface slant wells for the Seawater Intake System are proposed within the southern portion of the CEMEX property, in an area that is no longer mined and has been restored by CEMEX consistent with the Reclamation Plan; the proposed Source Water Pipeline would be aligned beneath the existing CEMEX access road. Construction equipment, materials, and trucks would access the existing CEMEX access road via Lapis Road. Increased truck traffic on the CEMEX access road from project-related construction vehicles and the temporary reduction in the width of the access road during installation of the Source Water Pipeline could delay the movement of vehicles through the CEMEX facility. Although mining operations could experience minor disruptions during project construction, mining operations would continue throughout project construction. Therefore, project implementation would not result in the temporary loss of known mineral resources and construction-related impacts would be less than significant.

This analysis assumes the current methods of sand extraction could continue during project construction and possibly during the first several months of future operations, subject to the schedule requirements of the Settlement Agreement signed by CalAm, the CCC, the California State Lands Commission, and the City of Marina, as discussed in Section 4.17.1.2, Mining Operations. Upon completion of project construction, the CEMEX access road would be restored to its existing condition and purpose. The Source Water Pipeline would be buried beneath the access road and would not interfere with the movement of mining vehicles or other sand mining activities. Since CEMEX is currently only mining sand from the dredging pond in the northern portion of the property, the siting of the subsurface slant wells in the southern portion of the CEMEX property would not interfere with sand mining activities or adversely affect the availability of mineral resources for future recovery. As noted in **Table 3-1** in Section 3.2 Project Components, slant well sites 2 through 6 would include a concrete pad ranging in size from 5,250 and 6,025 square feet. These structures could preclude mineral resource extraction but since sand mining is being discouraged by regulatory entities, this particular area is no longer being mined and is now under a reclamation plan. Therefore, it is unlikely that future sand mining would be permitted in the southern portion of the CEMEX property, and this impact would be less than significant.

The seafloor and subsurface mineral materials (e.g., sand, sediments) that overlie the ends of the subsurface slant wells within MBNMS would provide filtration for the ocean water taken in by the subsurface slant wells. The proposed project's use of this environmental service provided by the seafloor and subsurface mineral materials would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state or result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. No mineral resource consumption or extraction would occur related to the operation of the subsurface slant wells, and therefore, no impact would occur.

MPWSP Desalination Plant

There is no active mining in the proposed MPWSP Desalination Plant project area. However, the 46-acre Desalination Plant site is located in an area designated as MRZ-2. Constructing the MPWSP Desalination Plant on 25 acres of this site could limit the future recovery of mineral resources beneath the plant footprint. The MPWSP Desalination Plant site was previously used for agriculture but is currently fallow. Parcels designated as important farmland by the California Department of Conservation surround the proposed site (CDC, 2015) and mineral extraction would be an incompatible land use, thereby limiting the mining potential of the adjacent and subject parcel. Further, even if implementation of the proposed project were to preclude future recovery of mineral resources at the MPWSP Desalination Plant site, this impact would not be significant due to the small size of the site relative to the overall size of the mineral resource zone. The MRZ-2 area within the study area is roughly 7,000 acres, therefore the MPWSP Desalination Plant footprint would preclude approximately 0.36 percent of future mineral recovery potential. Implementation of the MPWSP Desalination Plant would have a less-than-significant impact on mineral resources.

All Other Pipelines and Conveyance Facilities North of Reservation Road

Construction of portions of the Source Water Pipeline, the new Desalinated Water Pipeline, and the Castroville Pipeline would occur either within or adjacent to the Charles Benson Road rights-of-way and within the Monterey Peninsula Recreational Trail and/or the Transportation Agency for Monterey County (TAMC) rights-of-way. Construction of the Brine Discharge Pipeline and Pipeline to the CSIP Pond would generally occur within existing road rights-of-way but certain pipeline segments could be installed adjacent to the road shoulder in undeveloped portions of the MRZ-2 area. The Brine Mixing Box would be installed adjacent to a road shoulder in an undeveloped portion of the MRZ-2 area. Installing these components within or adjacent to existing road rights-of-way would minimize disturbance to nearby MRZ-2 land and future mining operations. Because the proposed pipelines would have a limited footprint and would not be constructed across any active mining areas, they would not result in a significant reduction in the availability of mineral resources (primarily sand dunes). Therefore, the construction and operation of the proposed conveyance facilities would have a less-than-significant impact on mineral resources.

Pipelines and Other Conveyance Facilities South of Reservation Road

The impacts on mineral resources associated with project components located south of Reservation Road would be similar to those of the conveyance facilities located north of Reservation Road. Because these facilities would generally be constructed within road rights-of-way and would have limited footprints, the potential impact on mineral resources would be less than significant.

ASR-5 and ASR-6 Wells

The proposed ASR-5 and ASR-6 Wells would be constructed along the east side of General Jim Moore Boulevard in Seaside, entirely on federally-owned land within the former Fort Ord military base. No active mining sites are known to exist within the former Fort Ord. The wells would not include a concrete pad so the impact on mineral resources would be less than significant. The wells would be built in the Fitch Park Military Housing area within 50-feet of existing homes, and the land uses in the vicinity of these facilities are predominantly residential, recreational (e.g., Bayonet and Black Horse Golf Courses), and public/quasi-public (e.g., Seaside Middle School); mineral extraction would be incompatible.

Impact Conclusion

The proposed project would not significantly affect the availability of known mineral resources for future recovery or substantially interfere with active mining operations at the CEMEX sand mining facility. The impact would be less than significant.

For a discussion of mitigation measures that would apply to all project components related to traffic control and safety, as well as roadway rehabilitation, see Section 4.9, Traffic and Transportation, Impacts 4.9-1 and 4.9-6.

Mitigation Measures

None proposed.

4.17.6 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects.

Impact 4.17-C: Cumulative impacts related to mineral resources. (*Less than Significant*)

As described in Section 4.17.5, above, the MPWSP would have a less-than-significant impact on mineral resources. The geographic extent of potential cumulative mineral resources impacts includes the sites of proposed MPWSP components and areas in coastal Northern Monterey County that are mapped by the California Department of Conservation as MRZ-2, meaning the area contains or is thought to contain significant mineral deposits, particularly sand and gravel. The MPWSP and most of the cumulative projects identified in **Table 4.1-2** are located in an area mapped as MRZ-2. The timeframe during which the MPWSP could contribute to mineral resources effects includes the 24-month construction phase.

The MPWSP seawater intake facilities that are proposed at CEMEX would be set back from active mining areas and would not preclude sand mining activities. None of the cumulative projects identified in **Table 4.1-2** would be constructed within, or would otherwise disrupt, the CEMEX active mining area, with the exception of the CEMEX Removal Plan (No. 63) which requires that sand mining operations cease, all structures associated with mining operations be removed, and the affected area be restored by December 31, 2020. Therefore, operation of the cumulative projects would not affect CEMEX mining operations.

However, development of the MPWSP and many of the projects in **Table 4.1-2** would preclude the use of other lands within the MRZ-2 designation for sand, gravel, and stone mining for the duration of these cumulative projects' lifetimes. A large portion of the MRZ-2 area in the project vicinity is already developed, and development of certain components of the MPWSP and cumulative projects within that zone would further limit the amount of land available for potential future mining operations within the MRZ-2. The only project planned in an undeveloped portion of the MRZ-2 area is the Collection at Monterey Bay Resort (No. 56). This approved 340-room coastal resort is planned on a 26.46-acre site located west of Highway 1 and north of Tioga Avenue in Sand City. The construction and operation of the resort would contribute to the loss of availability of a known mineral resource, but not a locally important mineral resource recovery site since CEMEX is the only active mining operation in coastal Northern Monterey County. However, Sand City's General Plan specifically states that "Sand City has adopted a policy of not allowing the reestablishment of any mining within the city limits" (City of Sand City, 2002). Therefore, the General Plan precludes the mineral resource extraction from the area where the Collection at Monterey Bay Resort will be constructed and operated. As a result, the resort would not change the availability of this site for mining compared to existing conditions.

Since all cumulative projects in MRZ-2, including MPWSP, are on developed lands, on areas adjacent to important farmland which limits mining potential (the Desalination Plant component of the MPWSP), or on lands where mining is prohibited (the Collection at Monterey Bay Resort), the combined effects of cumulative projects in MRZ-2 would not have a significant cumulative impact on the availability of mineral resources relative to the total amount of known mineral resources available. As a result, MPWSP implementation would have a less than significant contribution to the cumulative impact on mineral resources.

Mitigation Measures

None proposed.

References – Mineral Resources

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4.18 Energy Conservation

This section presents the impacts of the proposed project related to energy use and conservation. Existing energy supply sources and energy use in Monterey County and California as a whole are discussed. Regulatory requirements pertaining to energy use and conservation are described. Mitigation measures are prescribed to avoid or reduce the inefficient, wasteful, and unnecessary energy consumption associated with project implementation.

CEQA § 21100(b) requires evaluation of the potential energy impacts of a proposed project, and consideration of mitigation measures that would avoid or reduce the wasteful, inefficient, and unnecessary consumption of energy associated with the project. Appendix F of the CEQA Guidelines provides three goals for energy conservation:

- Decrease overall per capita energy consumption;
- Decrease reliance on natural gas and oil; and
- Increase reliance on renewable energy sources.

In addition, Appendix F of the CEQA Guidelines indicates that EIRs may include consideration of the following six energy conservation-related environmental impact types:

1. The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal. If appropriate, the energy intensiveness of materials may be discussed.
2. The effects of the project on local and regional energy supplies and on requirements for additional capacity.
3. The effects of the project on peak and base period demands for electricity and other forms of energy.
4. The degree to which the project complies with existing energy standards.
5. The effects of the project on energy resources.
6. The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

With regard to NEPA, the Council on Environmental Quality (CEQ) regulations 40 CFR 1502.16(e) require analysis of "energy requirements and conservation potential of various alternatives and mitigation measures."

This section does not address the potential air pollutant or greenhouse gas emissions associated with various forms of energy consumption. See Sections 4.10, Air Quality, and 4.11, Greenhouse Gas Emissions, for such discussions.

4.18.1 Setting/Affected Environment

The study area for the analysis of energy conservation impacts is state-wide in terms of energy supplies, and site specific in terms of the energy consumption associated with the project's various components. There are no MBNMS resources that would be affected by impacts identified in this section; all impacts related to energy conservation would occur outside of MBNMS boundaries. Therefore MBNMS resources are not described in the environmental setting/affected environment.

4.18.1.1 California's Energy Supplies

With a relatively mild Mediterranean climate and strict energy efficiency and conservation requirements, California's per capita energy consumption ranked 48th in the nation, indicating a low per capita use of energy; the state's low use of energy was due in part to this mild climate and its energy efficiency programs (USEIA, 2016a). Nevertheless, with a population of 38.7 million people, California is the second largest energy-consuming state in the U.S. (USEIA, 2016b).

Electricity

The production of electricity requires the consumption or conversion of energy resources such as water, wind, oil, gas, coal, solar, geothermal, and nuclear sources. Of the electricity generated in California in 2015, 44.0 percent was generated by natural gas-fired power plants, 6.0 percent by coal-fired power plants, 5.4 percent from large hydroelectric dams, 9.2 percent from nuclear power plants, and 21.9 percent from renewable sources including solar and wind power (CEC, 2016a). The remaining balance (13.5 percent) came from unspecified sources (CEC, 2016a).

Natural Gas

Most of the natural gas consumed in California is extracted from on- and off-shore sites from the producing regions of the southwest (42 percent), the Rocky Mountains (23 percent), and Canada (22 percent), while the remainder is produced in California (12 percent) (CEC, 2016c). Although contractually California can receive natural gas from any producing region in North America, due to the current natural gas pipeline configurations, California can only import physical supplies from the three producing regions referenced above.

In 2012, California consumed 2,313 billion cubic feet of natural gas per day (CEC, 2016c). Of this, the majority (45 percent) was used for California's electricity market. The other end users of natural gas were the residential (21 percent), industrial (25 percent), and commercial (9 percent) sectors. Transportation, storage, and transmission losses accounted for the remaining natural gas consumption (CEC, 2016c).

Gasoline

Gasoline is by far the largest transportation fuel by volume used in California. Nearly all of the gasoline used in California is obtained through the retail market. In 2012, approximately 14.5 billion gallons of gasoline were sold in California's retail market (CEC, 2016f).

Diesel

Diesel fuel is the second largest transportation fuel by volume used in California behind gasoline. It is estimated that approximately 44 percent of total diesel sales in California are associated with retail sales. In 2012, more than three billion gallons of diesel were sold in California's retail market (CEC, 2016e). According to the U.S. Department of Energy's Energy Information Administration, nearly all semi-trucks, delivery vehicles, buses, trains, ships, boats and barges, farm, construction, and military vehicles and equipment have diesel engines.

4.18.1.2 Local Energy Systems

Electricity

Electricity is generated and distributed via a network of high voltage transmission lines commonly referred to as the power grid. Pacific Gas and Electric Company (PG&E) provides electrical power to approximately 16 million people throughout a 70,000 square mile service area in Northern and Central California, including Monterey County (PG&E, 2016b). PG&E's service area extends from Eureka to Bakersfield (north to south), and from the Sierra Nevada to the Pacific Ocean (east to west). PG&E produces and purchases energy from a mix of conventional and renewable generating sources. **Table 4.18-1** shows the electric power mix that PG&E delivered to its customers in California in 2015.

TABLE 4.18-1
PG&E'S 2015 ELECTRIC POWER MIX DELIVERED TO CUSTOMERS

Power Source	Percentage of Total
Nuclear	23%
Natural Gas	25%
Large Hydroelectric	6%
Coal	<1%
Other[a]	<1%
Unspecified Sources[b]	17%
Eligible Renewables	30%

NOTES:
[a] "Other" includes diesel oil and petroleum coke (a waste byproduct of oil refining).
[b] "Unspecified Sources" refers to electricity purchased from the grid that is not traceable to specific generation sources by any auditable contract trail.

SOURCE: PG&E, 2016a.

Of the electricity delivered by PG&E to its customers in 2015, 25 percent was generated by natural gas-fired power plants, 6 percent came from large hydroelectric dams, and 23 percent came from nuclear power plants. The remaining in-state electrical power generation (47 percent) was supplied by renewable sources (30 percent) and other unspecified sources (17 percent) (PG&E, 2016a).

The most recent year for electrical energy consumption data (2015) by county shows that the amount of electrical energy consumed within Monterey County totaled 2,666 million kilowatt-hours, which represents about 2.6 percent of PG&E's total electricity consumed in 2015 (CEC, 2016b).

Natural Gas

Natural gas service is provided in the project area by PG&E, which serves approximately 16 million customers through 6,750 miles of gas transmission lines. PG&E's natural gas is delivered via high-pressure pipelines to its load centers with compressors used to maintain transmission pressure. The gas is then received at either an underground storage facility or redistributed through another series of smaller distribution pipelines. The most recent year of natural gas consumption data (2015) by county shows that the amount of natural gas consumed within Monterey County totaled 102.46 million therms of natural gas, which represents about 2.3 percent of PG&E's total natural gas consumed in 2015 (CEC, 2016b).

Gasoline and Diesel Fuel

In 2012, all retail sales of diesel fuel in Monterey County were 30 million gallons (CEC, 2016e), suggesting that the total diesel sales in the county were approximately 68 million gallons given that approximately 44 percent of total diesel sales in California are associated with retail sales. The total 2012 sales of gasoline in the county were 147 million gallons (CEC, 2016f).

4.18.2 Regulatory Framework

This section summarizes federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as "regulatory requirements") pertaining to energy efficiency and conservation and indicates the project's consistency with those regulatory requirements. The consistency findings are for the project as proposed, without mitigation. In cases where the proposed project would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to a specific impact discussion in Section 4.18.5, Direct and Indirect Effects of the Proposed Project, where the potential inconsistency is addressed further.

4.18.2.1 Federal Regulations

Energy Policy and Conservation Act

The Energy Policy and Conservation Act of 1975 was established in response to the oil crisis of 1973, which increased oil prices due to a shortage of reserves. The Act required that all vehicles sold in the U.S. meet certain fuel economy goals. Since 1990, the fuel economy standard for new passenger cars has been 27.5 miles per gallon. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 miles per gallon. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not subject to fuel economy standards. The project would be consistent with the Act because all passenger cars and light trucks that would be used directly or indirectly associated with the project would be required to comply with the applicable fuel economy standards.

Energy Policy Act of 2005

The Energy Policy Act of 2005 seeks to reduce reliance on non-renewable energy resources and provide incentives to reduce current demand on these resources. For example, under the Act, consumers and businesses can obtain federal tax credits for fuel-efficient appliances and products, including buying hybrid vehicles, building energy-efficient buildings, and improving the energy efficiency of commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment. It is unknown whether or not CalAm will attempt to obtain any federal tax credits associated with the project under the Energy Policy Act of 2005.

4.18.2.2 State Regulations

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) was enacted by the State Legislature in 1976 to provide long-term protection of the State's 1,100-mile coastline for the benefit of current and future generations. The Coastal Act provides for the long-term management of lands within California's coastal zone boundary, as established by the Legislature and defined in Coastal Act (Section 30103). The width of the coastal zone varies across the State, extending inland a couple hundred feet in some locations to 5 miles in others, and offshore out to 3 miles. A map of the coastal zone in the project vicinity is shown in **Figure 4.8-1**.

The Coastal Act includes specific policies for management of natural resources and public access within the coastal zone (see Division 20 of the Public Resources Code). Of primary relevance to energy conservation is a Coastal Act policy concerning minimizing adverse impacts by requiring new development to minimize energy consumption and vehicle miles traveled. A preliminary assessment of project consistency with these priorities is provided below. Final determinations regarding project consistency are reserved for the Coastal Commission.

With respect to minimizing energy consumption and vehicle miles traveled, MPWSP construction will be consistent with Coastal Act policies. The proposed project would be required to comply with State and local regulations regarding energy efficiency and would be designed to maximize energy efficiency and minimize energy consumption. With respect to vehicle miles travelled, the proposed project would result in both short-term and long-term increases in traffic on regional and local roadways. However these increases would be reduced with the implementation of mitigation.

State of California Integrated Energy Policy

In 2002, the Legislature passed Senate Bill 1389, which required the California Energy Commission (CEC) to develop an integrated energy plan every 2 years for electricity, natural gas, and transportation fuels, for the California Energy Policy Report. The plan calls for the state to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for Zero Emission Vehicles and their infrastructure needs, and encouragement of urban designs that reduce vehicle miles traveled and accommodate pedestrian and bicycle access.

The CEC adopted the 2016 Integrated Energy Policy Report in February, 2017. The 2016 Integrated Energy Policy Report provides the results of the CEC's assessment of a variety of issues, and covers a broad range of topics including: initiatives to reduce greenhouse gas emissions; transformation of the electricity system towards renewable energy sources; the management of aging energy infrastructure; the environmental performance of the electricity generation system; landscape-scale planning the response to the leak at the Aliso Canyon natural gas storage facility, transportation fuel supply reliability issues; updates on Southern California electricity reliability; methane leakage; climate adaptation activities for the energy sector; climate and sea level rise scenarios; and the California Energy Demand Forecast (CEC, 2016i). Although the integrated energy plan is not directly applicable to the project given that the project would not include utility-scale energy generation or transmission infrastructure, it is applicable to the operations of PG&E, which is the public utility that would provide the required electricity for the project. Given that PG&E is required to comply with the applicable provisions of the integrated energy plan, electricity obtained for the project would be generated in a manner consistent with the spirit of the integrated energy plan.

Title 24 Building Energy Efficiency Standards (California Energy Code)

The California Building Standards Commission first established Energy Efficiency Standards for California in 1978, in response to a legislative mandate to reduce California's energy consumption. The standards, which are contained in the California Code of Regulations, Title 24, Part 6 (also known as the California Energy Code) are updated periodically by the CEC to allow consideration and possible incorporation of new energy efficiency technologies and methods. The standards regulate energy consumed in nonresidential buildings for heating, cooling, ventilation, water heating, and lighting (CEC, 2013b). Title 24 is implemented through the local planning and permit process and therefore project components requiring building permits would be required to comply with Title 24. Title 24 is updated approximately every 3 years. The newest version was adopted in January 2016, and continues to improve upon the standards for new construction of, and additions and alterations to, residential and nonresidential buildings (CEC, 2016f and 2016g). All heating, cooling, ventilation, water heating, and lighting systems in buildings developed as part of the project would be required to incorporate the applicable standards of Title 24. The project would be required to be consistent with Title 24 Building Energy Efficiency Standards.

California Green Building Standards Code (Cal Green)

On January 1, 2014, the California Building Standards Commission adopted the California Green Building Standards Code (Part 11 of the Title 24 Building Standards Code) for all new construction statewide (CBSC, 2014). The code sets targets for energy efficiency, water consumption, dual plumbing systems for potable and recyclable water, diversion of construction waste from landfills, and use of environmentally sensitive materials in construction and design, including eco-friendly flooring, carpeting, paint, coatings, thermal insulation, and acoustical wall and ceiling panels. The code identifies non-residential mandatory measures regarding site selection, building design, building siting and development to protect, restore, and enhance the environmental quality of the site and respect the integrity of adjacent properties. The proposed project would be required to incorporate the applicable provisions of the California Green Building Standards Code and would therefore be consistent with this set of regulations.

4.18.2.3 Applicable Regional and Local Land Use Plans, Policies, and Regulations

Table 4.18-2 presents the state, regional, and local land use plans, policies, and regulations pertaining to energy conservation that are relevant to the MPWSP and that were adopted for the purpose of avoiding or mitigating an environmental effect. **Table 4.18-2** also indicates project consistency with such plans, policies, and regulations. The analysis concludes that the proposed project would not conflict with the applicable plans, policies, or regulations, and no further discussion is provided.

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TABLE 4.18-2
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO ENERGY CONSERVATION

Project Planning Region	Applicable Planning Document	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
County of Monterey and Cities of Marina and Seaside	California Code of Regulations, Title 24, Part 6	Building Energy Efficiency Standards	Subsurface slant wells, MPWSP Desalination Plant, and Carmel Valley Pump Station	Monterey County and the cities of Marina and Seaside have incorporated the California Building Energy Efficiency Standards Code by reference into their municipal codes.	This section of the California Building Code requires compliance with Title 24 through the building permit process.	Consistent: Energy efficiency elements would be incorporated into building support systems, electrical and treatment equipment, and process design associated with the MPWSP Desalination Plant. Building support systems would comply with Title 24 Building Energy Efficiency Standards. The proposed action would be required to comply with State and local regulations regarding energy efficiency and would be designed to maximize energy efficiency and minimize energy consumption. The proposed subsurface slant wells reduce energy demand when compared to open water intakes by providing an initial level of treatment through the beach sand. In addition, the proposed project would incorporate various energy efficient design elements into building support systems, electrical and treatment equipment, and process design that would reduce operational energy demand.
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 18.12 – Green Building Standards Code	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Brine Mixing Box, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Section 18.12*** adopts the 2010 California Green Building Standards Code by reference and includes incentives for new construction to incorporate green building practices.	The 2010 California Green Building Standards are designed to reduce energy consumption.	Consistent: The proposed action would be required to comply with State and local regulations regarding energy efficiency.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space		***Policy OS-9.1:*** The use of solar, wind and other renewable resources for agriculture, residential, commercial, industrial, and public building applications shall be encouraged.	The intent of this policy is to promote efficient energy use.	Consistent: Although the proposed project does not include the use of renewable energy resources, it does include numerous technological design features to reduce operational energy demand and maximize energy efficiency, including the incorporation of various energy efficient design elements into building support systems, electrical and treatment equipment, and process design.

SOURCE: County of Monterey, 2010.

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4.18.3 Evaluation Criteria

Based on Appendix F of the CEQA Guidelines, implementation of the proposed project would have a significant impact related to energy conservation if it would:

- Use large amounts of fuel or energy in an unnecessary, wasteful, or inefficient manner;
- Constrain local or regional energy supplies, require additional capacity, or affect peak and base periods of electrical demand;
- Require or result in the construction of new electrical generation and/or transmission facilities, or expansion of existing facilities, the construction of which could cause significant environmental effects; or
- Conflict with existing energy standards, including standards for energy conservation.

Based on the nature of the proposed project, the following significance criteria are not addressed further in the EIR/EIS:

Conflict with energy standards, including standards for energy conservation. The local government jurisdictions that encompass the project area, including Monterey County and the Cities of Marina, Seaside, Sand City, and Pacific Grove, have incorporated the California Building Standards Code by reference into their municipal codes. As described in Section 4.18.2.2, above, Part 6 of the California Building Standards Code contains the California Energy Code (CCR Title 24, Part 6). The local government building permit application review process would ensure that the proposed project is compliant with all applicable state and local energy conservation standards. In addition, as reflected in Section 4.18.2.3, the plan, policy, and regulation consistency analysis conducted for the project concluded that the proposed project would not conflict with the applicable plans, policies, or regulations. Therefore, no impact related to compliance with applicable energy and energy conservation standards would result, and this criterion is not discussed further in this section.

Require or result in the construction of new electrical generation and/or transmission facilities, or expansion of existing facilities, the construction of which could cause significant environmental effects. The proposed project would not require or result in the construction of new or expanded electrical generation and/or transmission facilities. As discussed in Chapter 3, Description of the Proposed Project, new underground and aboveground powerlines would be constructed only to connect the proposed facilities to the existing local PG&E power grid.

4.18.4 Approach to Analysis

This analysis is based, in part, on basic assumptions regarding construction-related diesel and gasoline consumption for the proposed project, CalAm's proposed energy efficiency design elements for the MPWSP Desalination Plant (CDM Smith, 2014), and estimates of the operational electricity requirements of the proposed project (CalAm, 2016). The analysis focuses on the anticipated energy demand and energy efficiency of the proposed project as a whole, including during construction, operation, maintenance, and decommissioning of the proposed facilities. This analysis assumes all electrical power needed for project operations would be provided by the local PG&E electrical power grid. The energy efficiency measures that would be incorporated into MPWSP Desalination Plant design, as well as an alternative energy source that is being pursued by CalAm to support project operations, are summarized below.

4.18.4.1 Fuel Consumption

Off-road equipment inventories and construction and maintenance activity assumptions were used by the CPUC's consultant (Environmental Science Associates [ESA]) to estimate fuel amounts that would consumed by off-road equipment during construction and maintenance of the project. Fuel consumption factors for off-road equipment were derived from equipment inventory data using the California Air Resources Board's off-road emissions inventory database. Fuel use that would be associated with commuting workers and truck hauling during construction and operation of the project were also estimated using trip data projected for the project (see **Appendix G1** for all fuel consumption factors and assumptions).

4.18.4.2 Energy Efficient Design Elements for Desalination Plant

As discussed in Chapter 3, Description of the Proposed Project, the proposed project would use reverse osmosis (RO) technology to remove salts and other minerals from seawater. During the RO process pretreated source water is forced at very high pressures through RO membranes. Generating the necessary high pressure can require a large amount of energy. However, the MPWSP Desalination Plant would incorporate various technological advancements to reduce the operational energy demand as much as possible. These advances include the use of the latest generation of RO membranes that utilize the lowest operating pressure requirements (Pacific Institute, 2013). In addition, the RO system would incorporate an energy recovery system that utilizes pressure exchange technologies to recover energy from the high-pressure waste stream and reduce overall pumping power requirements (and energy consumption) for the RO modules (CDM Smith, 2014).

Energy efficiency elements would also be incorporated into building support systems, electrical and treatment equipment, and process design associated with the MPWSP Desalination Plant. Building support systems would comply with Title 24 Building Energy Efficiency Standards. These standards include the use of motion detectors for lighting, energy-efficient fluorescent lamps for interior lighting, and high pressure sodium vapor lamps for exterior lighting. Heating, ventilation, and insulation systems would be designed to use waste heat from motors and electric equipment to heat certain areas of the treatment and process buildings and reduce the overall energy use of the plant. Piping system materials and sizing would be designed to limit pressure losses and reduce pumping and energy requirements. Electrical and treatment equipment would include variable frequency drives to reduce the operating speed of pumps to match the pump discharge pressure requirements and reduce energy usage (CDM Smith, 2014).

4.18.4.3 Landfill-Gas-to-Energy Option

This EIR/EIS conservatively assumes that all proposed operational power requirements would be met via the existing PG&E power grid.

However, CalAm is actively pursuing a renewable energy source option with Monterey Regional Waste Management District (MRWMD) that would allow CalAm to meet a portion of the MPWSP Desalination Plant operational energy requirements with methane gas from the existing MRWMD landfill-gas-to-energy (LFGTE) facility located adjacent to the MPWSP Desalination Plant site. The MRWMD LFGTE facility produces 5.07 Megawatts (MW) of continuous electricity that is sold to PG&E. MRWMD plans to increase the electric generation capacity of the LFGTE facility by 3.2 MW in two stages; the first phase of improvements would increase the capacity by 1.6 MW, followed by an additional 1.6-MW increase in six to eight years. Once the expansion is complete, the total generation capacity of the LFGTE facility would be 8.27 MW (ESI, 2014).

If this renewable energy source option is implemented, about half of the MPWSP Desalination Plant operational energy requirements could be met with methane gas from the LFGTE facility. Overhead powerlines, electrical transformers, metering devices, and switchgear would be needed to connect the MRWMD LFGTE facility with the MPWSP Desalination Plant. Implementation of this option and the construction of the associated interconnection improvements would require separate environmental review.

4.18.5 Direct and Indirect Effects of the Proposed Project

Table 4.18-3 provides a summary of the proposed project's impacts associated with energy conservation.

TABLE 4.18-3
SUMMARY OF IMPACTS – ENERGY CONSERVATION

Impacts	Significance Determinations
Impact 4.18-1: Use large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during construction and decommissioning.	LSM
Impact 4.18-2: Use large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during operations and maintenance.	LS
Impact 4.18-3: Constrain local or regional energy supplies, require additional capacity, or affect peak and base periods of electrical demand during operations.	LS
Impact 4.18-C: Cumulative impacts related to energy conservation.	LSM

NOTES:
LSM = Less than Significant impact with Mitigation
LS = Less than Significant

4.18.5.1 Construction Impacts

Impact 4.18-1: Use large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during construction and decommissioning. *(Less than Significant with Mitigation*)

All Project Components

Construction of the proposed project would require the use of fuels (primarily gasoline and diesel) for operation of construction equipment (e.g., dozers, excavators, and trenchers), construction vehicles (e.g., dump and delivery trucks), and construction worker vehicles. Direct energy use would also include the use of electricity required to power construction equipment (e.g., welding machines and electric power tools). In addition, project construction would result in indirect energy use associated with the extraction, manufacturing, and transportation of raw materials to make construction materials. Indirect energy use typically represents about three-quarters of the total construction energy consumed, while direct energy use represents about one-quarter (Hannon et al., 1978).

Although the precise amount of construction-related direct energy consumption that would occur under the proposed project is unknown, it is estimated that off-road construction equipment would operate for a total of approximately 138,126 hours and would consume a total of approximately 387,846 gallons of diesel fuel at an average rate of 2.8 gallons per hour. With regard to vehicle use during construction, workers' personal vehicles would make 154,241 trips and consume approximately 74,512 gallons of gasoline (assuming an average fuel economy of 20.7 miles per gallon) and heavy haul trucks would make 79,884 trips and consume approximately 718,956 gallons of diesel fuel (assuming an average consumption rate of 7.0 miles per gallon) (see **Appendix G1** for all assumptions and fuel use factors). When averaged over the two-year construction period, annual fuel use for off-road construction equipment would be approximately 193,923 gallons of diesel fuel per year, construction workers' personal vehicles would consume approximately 37,256 gallons of gasoline per year, and heavy haul trucks would consume approximately 359,478 gallons of diesel fuel per year. The total average annual fuel use during the two-year construction period would be approximately 37,256 gallons per year of gasoline and approximately 553,401 gallons per year of diesel fuel.

These annual average fuel use amounts are equivalent to less than one percent of the total amounts of gasoline and diesel fuel sold in Monterey County in 2012 (see Section 4.18.1.2, *Local Energy Systems*). With regard to decommissioning of the project, amounts of direct energy consumption that would occur at the end of the useful life of the project (in approximately 40 years) related to decommissioning is unknown; however, it is anticipated that the amounts would be similar to those required for construction, discussed above.

The amount of electricity consumption that would be associated with construction of the project is unknown and cannot be estimated as it would be too speculative given existing data; however, the amount would not be expected to be substantial.

While the overall transportation energy use requirements would not be significant relative to the overall sales of transportation fuels in the county, construction and decommissioning activities could result in wasteful or inefficient use of energy if construction and decommissioning equipment is not well maintained, if equipment is left to idle when not in use, or if haul trips are not planned efficiently. For all project components, the potential for construction and decommissioning to use large amounts of fuel or energy in a wasteful or inefficient manner is considered a significant impact. However, with implementation of **Mitigation Measures 4.18-1 (Construction Equipment and Vehicle Efficiency Plan)** and **4.10-1b (Idling Restrictions)**, which identify several performance standards, would ensure construction activities are conducted in a fuel-efficient manner and minimize idling times for construction equipment and vehicles, the impact would be reduced to a less-than-significant level.

Mitigation Measures

Mitigation Measure 4.18-1 applies to all project components.

Mitigation Measure 4.18-1: Construction Equipment and Vehicle Efficiency Plan.

CalAm shall contract a qualified professional (i.e., construction planner/energy efficiency expert) to prepare a Construction Equipment Efficiency Plan that identifies the specific measures and performance standards that CalAm (and its construction contractors) will implement as part of project construction and decommissioning to increase the efficient use of construction equipment and vehicles to the maximum extent feasible. Such measures shall include, but not necessarily be limited to: procedures to ensure that all construction equipment is properly tuned and maintained at all times; requirement to provide options for worker carpooling; a commitment to utilize existing electricity sources where feasible rather than portable diesel-powered generators; and identification of procedures (including the routing of haul trips) that will be followed to ensure that all materials and debris hauling is conducted in a fuel-efficient manner. The plan shall be submitted to CPUC and the Sanctuary for review and approval at least 30 days prior to the beginning of construction activities and at least 30 days prior to the beginning of decommissioning activities.

Mitigation Measure 4.10-1b applies to all project components.

Mitigation Measure 4.10-1b: Idling Restrictions.

(See Impact 4.10-1 in Section 4.10, Air Quality, for description.)

4.18.5.2 Operational and Facility Siting Impacts

Impact 4.18-2: Use large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during operations and maintenance. (*Less than Significant*)

All Project Components

Operation of the proposed project would result in the consumption of electricity to operate the subsurface slant wells, MPWSP Desalination Plant (e.g., reverse osmosis [RO] modules, pumps, lighting, process controls, heating, ventilation, and air conditioning [HVAC] systems), and other proposed facilities (e.g., Carmel Valley Pump Station).

In general, desalination plants require large amounts of electricity to operate and, as a result, operation of the MPWSP would result in the long-term consumption of substantial amounts of electricity, including electricity produced from non-renewable resources. CalAm's current electrical power demand associated with its existing water production facilities (primarily Carmel River and Seaside Groundwater Basin production wells) is approximately 11,466,000 kilowatt hours (kWh) per year, which represents the baseline electrical demand for the proposed project. CalAm's operational electrical power demand for water production under the proposed project (including water produced from the MPWSP Desalination Plant, Seaside Groundwater Basin production wells, ASR system, and the Carmel River, as well as conveyance of that water) is estimated to be approximately 63,364,310 kWh per year (CalAm, 2016). Therefore, the net increase in annual electrical power demand for water production would be approximately 51,898,310 kWh per year, which would equal approximately 1.95 percent of the total electrical demand in Monterey County and approximately 0.05 percent of total electricity distributed by PG&E.

In addition to electricity use, consumption of fuel would be required for CalAm staff commute trips to and from the MPWSP Desalination Plant and vehicle trips associated with routine maintenance and operations. The MPWSP Desalination Plant would be operated by approximately 30 CalAm employees, resulting in approximately 60 commuter vehicle trips per day. Approximately six truck trips would occur five days a week for the delivery of materials to the MPWSP Desalination Plant. These vehicle trips would consume an estimated 10,580 gallons of gasoline and 14,040 gallons of diesel fuel annually and would contribute to the energy demand required to support operation of the proposed project. In addition to vehicle use, maintenance of the slant wells would require the use of off-road equipment every five years. When averaged over the five-year period, the equipment required for this maintenance would consume approximately 1,469 gallons of diesel fuel annually (see **Appendix G1** for fuel use assumptions). Overall, the amount of gasoline and diesel required to fuel the vehicles and equipment during operation and maintenance of the project would be relatively small (approximately 10,580 gallons annually and 15,509 gallons annually, respectively). These vehicle trips and equipment use would be necessary to support operation and maintenance of the proposed project and would be equivalent to approximately 0.01 percent of the total amounts of gasoline and 0.02 percent total diesel fuel sold in Monterey County in 2012 (see Section 4.18.1.2, *Local Energy Systems*). The overall transportation energy use requirements during operation and maintenance would not be significant relative to the overall sales of transportation fuels in the county.

Operation of the proposed project would not result in unnecessary consumption of energy. Operation would use fossil fuels and electricity to develop potable water supplies and convey the water to CalAm's Monterey District service area. The MPWSP is needed to replace CalAm's existing supplies that have been constrained by legal decisions affecting diversions from the Carmel River and pumping from the Seaside Groundwater Basin (see Chapter 2, Water Demand, Supplies, Water Rights, and the Existing Water System, for additional information regarding the legal decisions). While the proposed project would require a large amount of electricity each year to operate, it is necessary to provide drinking water to area residents to protect human health and safety. Further, the proposed project would not consume energy wastefully or inefficiently. As summarized above, and described in Chapter 3, Description of the Proposed Project, Section 3.4.5, Power Demand, the design and construction of the MPWSP Desalination Plant would incorporate various energy-efficient design elements into building support systems, electrical and treatment equipment, and process design that would reduce operational energy demand.

Although the proposed MPWSP Desalination Plant would be designed to use energy as efficiently as possible using the most recent technological advancements available, implementation of the proposed project would result in a substantial increase in electrical power demand. However, the use of energy for operation of the MPWSP Desalination Plant is necessary because it would provide a reliable supply of water to meet existing demand for the Monterey District. Therefore, electricity consumed as a result of project operations would not be unnecessary, wasteful, or inefficient and the impact related to the use of fuel and energy during project operations would be less than significant.

Mitigation Measures

None proposed.

Impact 4.18-3: Constrain local or regional energy supplies, require additional capacity, or affect peak and base periods of electrical demand during operations. (*Less than Significant*)

As discussed above, implementation of the proposed project would increase CalAm's total electrical demand by approximately 51,898,310 kWh per year, which would represent approximately 1.95 percent of the County's electricity usage in 2015 (2,666 million kWh) and approximately 0.05 percent of electricity distributed by PG&E in 2015 (102,538 million kWh) (CalAm, 2016; CEC, 2016b).

The proposed project's impact on local and regional energy supplies depends on several factors; however, the primary energy source of concern associated with project operation is electrical power provided by PG&E. Based on PG&E's preliminary review of the proposed project's maximum electrical demand, PG&E has indicated that it has adequate capacity and infrastructure to support the proposed project (PG&E, 2016c). Therefore, implementation of the proposed project could be accommodated by the existing local and regional energy supplies and transmission facilities and the impact would be less than significant. Further, implementation of Mitigation Measure 4.11-1 described in Section 4.11, Greenhouse Gas Emissions, would improve the energy efficiency of the proposed project if feasible.

Mitigation Measures

Mitigation Measure 4.11-1 is relevant to energy conservation because it would reduce energy consumption; however, it is not required in order to reduce Impact 4.18-3 to a less-than-significant level. As described above, Impact 4.18-3 is less than significant even without implementation of this measure.

Mitigation Measure 4.11-1 applies to the project as a whole.

> **Mitigation Measure 4.11-1: GHG Emissions Reduction Plan.**
>
> (See Impact 4.11-1 in Section 4.11, Greenhouse Gas Emissions, for description.)

4.18.6 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects.

Impact 4.18-C: Cumulative impacts related to energy conservation. (*Less than Significant with Mitigation*)

As described in Section 4.18.3, the proposed project would have no impact related to conflicting with energy standards or the construction or expansion of new electrical generation and/or transmission facilities. Therefore, it would not contribute to cumulative impacts related to these topics.

Cumulative impacts associated with energy and energy conservation are considered in the context of both local and regional energy supply and demand. As described in Section 4.18.5.1, above, project construction could use large amounts of fuel or energy in a wasteful or inefficient manner, which in the context of local and regional energy supplies, in combination with the energy demands of the projects described in Table 4.1-2 in Section 4.1, could result in a significant cumulative impact. **Mitigation Measures 4.18-1 (Construction Equipment and Vehicle Efficiency Plan)** and **4.10-1b (Idling Restrictions)** would be implemented to ensure construction activities would be conducted in a fuel-efficient manner. Idling times would be limited for construction equipment and vehicles to ensure that energy waste and inefficiency would be minimized. Energy used during construction would primarily be in the form of gasoline and diesel fuel. Even if project construction was to occur simultaneously with other cumulative projects, the cumulative use of energy resources during construction would be consistent with normal construction practices and would comply with efficiency- and conservation-related policies intended to address cumulative energy consumption statewide. Therefore, after mitigation, project construction would have a less than significant contribution to a significant cumulative impact on the supply and/or availability of these fuel sources during construction.

During project operation, various energy conservation measures would be implemented (see Section 4.18.4) as part of the proposed project to reduce energy waste, ensuring that operational impacts associated with energy use would not be unnecessary, wasteful, or inefficient. In addition, Mitigation Measure 4.11-1, GHG Emissions Reductions Plan, (see Impact 4.11-1 in Section 4.11.5) ensures that the project's operational electricity use results in net zero GHG emissions via the following loading order: on-site and/or locally secured renewable energy; off-site purchases of renewable energy; Renewable Energy Certificates (RECs); and Carbon Offsets. Although project operation would result in long-term consumption of substantial amounts of electricity, PG&E, who would be the electrical supplier, has indicated that it has adequate capacity and infrastructure to support the proposed project (PG&E, 2016c). As discussed above under Impact 4.18-3, the anticipated increase in electricity consumption for the proposed project would represent approximately 2 percent of Monterey County's annual usage, and an even smaller percentage of PG&E's overall service area usage (0.05 percent). It should be noted that PG&E purchases wholesale electric energy and capacity from generators and suppliers and periodically conducts solicitations / requests for offers (RFO) for additional supplies of conventional and renewable electricity. Therefore, in the event that many other cumulative projects listed in **Table 4.1-2** that would be high demand electricity users, such as the Monterey Bay Regional Water Project (DeepWater Desal, No. 34), request electrical service from PG&E, additional wholesale electric energy may need to be purchased by PG&E. In addition, some reinforcement or upgrades of the existing distribution system may also be required, but this would not substantially constrain local or regional energy supplies. Therefore, the proposed project would have a less than significant contribution to a significant cumulative impact associated with the unnecessary, wasteful, or inefficient use of energy, or with energy supply, either at a local or regional level, during operation.

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4.19 Population and Housing

This section describes the existing population and housing characteristics and trends in the vicinity of the Monterey Peninsula Water Supply Project (MPWSP or proposed project) and analyzes the potential for implementation of the proposed project to result in direct and/or indirect impacts on population and housing, including the potential for the project to result in the need for additional workforce to support project construction and operations. The potential for the provision of water supply from the MPWSP to indirectly induce growth is addressed in Section 6.3, Growth Inducement.

4.19.1 Setting/Affected Environment

The study area for the evaluation of effects related to population and housing displacement is Monterey County and in particular CalAm's Monterey District service area, which would be the area affected directly by potential population and housing effects of the proposed project. There are no MBNMS resources that would be affected by impacts identified in this section; all impacts related to population and housing would occur outside of MBNMS boundaries. Therefore, MBNMS resources are not described in the environmental setting/affected environment.

The proposed project lies within the cities of Marina, Seaside, and Monterey, and in unincorporated Monterey County, including the unincorporated community of Castroville. Except for the incorporated cities, however, population and housing data are not readily available for subcounty areas. Therefore, the analysis includes data for Monterey County as a whole. The study area for the evaluation of the direct growth inducing effects of the proposed project is the three-county Monterey Bay region consisting of Monterey, San Benito, and Santa Cruz counties. This is the region within which workers could be expected to commute between jobs and residences, and in particular, is the area within which construction workers would be expected to commute from their residences to temporary job sites elsewhere in the region.

4.19.1.1 Population, Housing and Labor Force

In January 2015, Monterey County was home to approximately 432,637 residents and had approximately 139,177 housing units. Between 1990 and 2015, the total population of Monterey County increased by about 22 percent, and the total number of housing units increased by about

15 percent (California Department of Finance, 2007; 2016). **Table 4.19-1** shows 2010 census data for population and housing, estimates of population and housing in 2015, and estimates of the 2010 and 2015 labor force[1] in the Monterey County jurisdictions that could be affected by implementation of the proposed project.

TABLE 4.19-1
POPULATION, HOUSING, AND LABOR FORCE IN POTENTIALLY AFFECTED JURISDICTIONS

	Population		Housing Units		Labor Force[c]	
Jurisdiction	**2010[a]**	**2015[b]**	**2010[a]**	**2015[b]**	**2010[c]**	**2015[c] EDD[b]**
Carmel-by-the-Sea	3,722	3,824	3,417	3,417	1,700	1,800
Del Rey Oaks	1,624	1,655	741	741	900	1,000
Monterey (city)	27,810	28,576	13,584	13,637	15,200	15,700
Pacific Grove	15,041	15,251	8,169	8,184	8,700	9,000
Sand City	334	376	145	176	200	200
Seaside	33,025	34,025	10,872	10,913	18,100	18,400
Unincorporated Area[d]	17,847	18,603	5,930	5,985	9,280	9,520
Total for Monterey District Service Area	***99,403***	***102,310***	***42,858***	***43,053***	***54,080***	***55,620***
Marina	19,718	20,496	7,200	7,334	11,300	12,000
Castroville[e]	6,481	See note e	1,539	See note e	3,200	3,200
Monterey County (Total)	415,057	432,637	137,910	139,177	215,800	221,400
San Benito County (Total)	55,269	56,445	17,870	18,262	27,900	29,800
Santa Cruz County (Total)	262,382	273,594	104,476	105,221	141,700	144,200

NOTES:
[a] Population and housing data for 2010 are from the U.S. Census Bureau's decennial census.
[b] Population and housing data for 2015 are estimates prepared by the California Department of Finance.
[c] Labor force data for 2010 and 2015 are estimates prepared by the California Employment Development Department; labor force refers to people who live in the area who are employed or looking for work, regardless of where they actually work.
[d] An estimated 4.3 percent of the countywide population inhabits the unincorporated portions of CalAm's Monterey District (ESA, 2014). As a result, the housing units and labor force for the unincorporated portion of the Monterey District were estimated as 4.3 percent of the county total.
[e] Since Castroville is unincorporated, data shown are for Castroville Census Designated Place (CDP). The California Department of Finance does not provide estimates for disaggregated unincorporated areas and to date estimates for 2015 are not available from the U.S. Census Bureau's Community Survey (ACS). The ACS estimates that in 2014 Castroville CDP had a population of 6,226 and had 1,550 housing units.

SOURCE: California Department of Finance, 2016; California Employment Development Department, 2013, 2016a, 2016b, 2016c, 2016d, 206e; U.S. Census Bureau, 2016a, 2016b.

4.19.1.2 Employment

The California Employment Development Department estimates that approximately 187,400 people worked in Monterey County in 2015, an increase of 5,400 jobs since 2014 and the county's peak annual average employment level to date (California Economic Development Department 2016c). This estimate measures workers by place of work and includes full-time and part-time wage and salary employment; it does not include self-employed people, unpaid family

1 Labor force refers to people living in the jurisdiction who are employed or looking for work, regardless of where they actually work.

workers, or private household employees[2] (California Economic Development Department 2016f). Total employment in Monterey County grew steadily from 1995 to 2000, leveled off between 2001 and 2008, when there were minor fluctuations of job gains and losses, and dropped substantially in 2009, reflecting the effects of the recession that began in late 2007-early 2008.[3] From 2008 to 2009 Monterey County lost more than 6,000 jobs, a 4 percent decline – from 174,100 jobs in 2008 to 168,000 in 2009. Employment as a whole in the county began to recover in 2010 and by 2013 the number of countywide jobs had slightly exceeded the previous peak in 2008. About 19,400 jobs were added in Monterey County from 2010 through 2015 (California Economic Development Department, 2016c). Approximately 16,000 people worked in San Benito County in 2015. This was slightly fewer than the 16,100 people working in the county in 2014 but 500 more than the number working in the county in 2013. While 1,700 jobs have been added in the county since 2010, the number of people working in the county in 2015 is still 1,900 fewer than at the county's employment peak, in 2007, when 17,900 people worked in the county (California Employment Development Department, 2016d). Approximately 106,500 people worked in Santa Cruz County in 2015, 2,800 more than in 2014. Since 2010, almost 9,000 jobs have been added in Santa Cruz County, although 2015 employment is still slightly less than the county's peak employment to date, in 2001, when 106,700 people worked in the county (California Economic Development Department 2016e).

Construction employment generally followed the same trend but the construction industry experienced more pronounced changes over this period compared to overall employment. Construction jobs grew at a faster rate between 1995 and 2001 compared to jobs overall and there was a much sharper decline in construction jobs from 2008 to 2009. Monterey County lost about 1,500 construction jobs in 2009, a 25 percent decrease from 2008; in addition, the construction industry began experiencing declines in employment earlier, in 2007, and the effects of the recession in this sector lasted longer compared to overall county employment. From 2006 through 2011 the county lost 3,400 construction jobs, a decrease of almost 50 percent over this six-year period. Construction employment began to increase slowly starting in 2012, and 1,300 jobs were added between 2012 and 2015. Nevertheless, there were 2,100 fewer construction jobs in the county in 2015 than in 2006 (5,100 people working in construction jobs in Monterey County in 2015 compared to 7,200 in 2006). In the three-county region that includes neighboring Santa Cruz and San Benito Counties as well as Monterey County, 7,600 construction jobs were lost between 2006 and 2011. As in Monterey County, construction employment in the three-county region began to recover in 2012, and 2,400 construction jobs were added between 2012 and 2015. In 2015 there were 9,800 people working in construction jobs in the three-county region, 5,200 fewer than in 2006 (California Employment Development Department, 2016c; 2016d; 2016e).

[2] The estimates of employment by place of work count part-time and full-time jobs equally. People who hold more than one job may be counted more than once.

[3] In Monterey County the effects of the recession on jobs overall were not reflected in job numbers (i.e., by fewer annual average jobs compared to the year before) until 2009.

4.19.2 Regulatory Framework

There are no federal, state, or local regulations governing population and housing that apply to the proposed project.

4.19.3 Evaluation Criteria

Implementation of the proposed project would have a significant direct or indirect impact related to population and housing if it would:

- Induce substantial population growth in an area, directly (for example, by proposing new homes and businesses);
- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Based on the location and nature of the proposed project, the following criteria are not considered in the impact analyses in Sections 4.19.5.1 and 4.19.5.2 for the reasons described below:

> ***Displace substantial numbers of housing units, necessitating construction of replacement housing.*** The proposed project would augment the existing water supply and construct new water supply infrastructure. Most facilities would be underground and the proposed desalination plant would be located on a currently vacant parcel. The proposed project would not displace any housing and would not necessitate construction of replacement housing. Therefore, the criterion related to housing displacement does not apply and is not addressed further in this section.

> ***Displace substantial numbers of people, necessitating construction of replacement housing.*** The proposed project would augment the existing water supply and construct new water supply infrastructure; it would not displace any people, including any workers, and would not necessitate construction of replacement housing elsewhere. Therefore, this impact criterion does not apply and is not addressed further in this section.

The impacts of growth that could be indirectly induced by the MPWSP are addressed in Section 6.3, Growth Inducement.

4.19.4 Approach to Analysis

In addition to CEQA requirements for addressing population and housing effects, CEQ Regulations contain a key provision that should be noted: “economic or social effects are not intended by themselves to require preparation of an environmental impact statement" (40 CFR 1508.14). However, when an EIS is prepared "and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment" (40 CFR 1508.14).

The evaluation of potential population and housing effects must consider employment associated with the concurrent construction of multiple project components; therefore, the analysis considers MPWSP construction as a whole, and similarly considers MPWSP operations as a whole rather than by component. The analysis compares the number of project-related jobs to current and recent employment levels in the three-county Monterey Bay region, which includes Monterey County, San Benito County, and Santa Cruz County, as a means to assess whether demand for project employment would likely be met primarily by the local and regional labor pool, or attract substantial numbers of workers from outside the region.

The evaluation of cumulative impacts considers the effects of cumulative projects in Monterey, San Benito, and Santa Cruz Counties. The analysis of cumulative population and housing impacts is based on growth projections contained in the general plans or related background documents of the three counties.

4.19.5 Direct and Indirect Effects of the Proposed Project

TABLE 4.19-2
SUMMARY OF IMPACTS – POPULATION AND HOUSING

Impacts	Significance Determinations
Impact 4.19-1: Induce substantial population growth directly during project construction.	LS
Impact 4.19-2: Induce substantial population growth directly during project operations.	LS
Impact 4.19-C: Cumulative impacts related to population and housing.	LS

NOTE:
LS = Less than Significant impact, no mitigation proposed

4.19.5.1 Construction Impacts

Impact 4.19-1: Induce substantial population growth directly during project construction. (*Less than Significant*)

During the approximately 24-month construction period up to 345 construction workers would be employed concurrently, according to planned construction phasing. The duration of construction for individual project components would vary substantially, however – from 2 months for the Pipeline to CSIP Pond to 24 months for the MPWSP Desalination Plant. Consequently, the number of construction workers needed would vary, from 90 to 345, over the 24-month construction period. Concurrent construction of project components is expected to require from 300 to 345 workers during the peak four months of construction (i.e., when the most components would be under construction concurrently). For another 11 months, 230 to 280 workers would be needed, and 90 to 100 workers would be needed during the final nine months of construction, primarily for completion of the desalination plant. Construction employment during the peak period (i.e., 345 jobs) represents 7 percent of the construction jobs in Monterey County in 2015 and 4 percent of the construction jobs in the three-county region comprising Monterey, Santa Cruz, and San Benito

Counties in 2015. The 90 to 280 jobs provided during the rest of the construction period represent 2 percent to 6 percent, respectively, of Monterey County construction jobs in 2015 and 1 percent to 3 percent, respectively, of construction employment in the three-county region.

Given that MPWSP construction jobs would represent a minor percentage of the current local and regional construction employment levels, MPWSP construction is not expected to create employment opportunities substantially greater than would normally be available to construction workers in the area. In addition, the substantial number of construction jobs lost in the county and region during the recession suggests the availability of workers not reflected in current job data. Therefore, construction workers needed for MPWSP construction are expected to be drawn from the local and regional labor pool. It is expected that construction workers who do not live in the vicinity of the MPWSP would commute from elsewhere in county or three-county region rather than relocate from more distant cities and towns. Consequently, construction of the MPWSP would not induce population growth by attracting a substantial number of workers from outside the region to relocate to the area, and therefore would not create demand for additional housing or other facilities and services associated with growth.

The proposed project does not involve any housing construction and would not induce growth directly by constructing housing that would attract people to the area. Therefore, construction of the proposed project would not directly induce a substantial increase in the local population and the direct growth-inducing impact of the proposed project would be less than significant.

Mitigation Measures

None proposed.

4.19.5.2 Operational and Facility Siting Impacts

Impact 4.19-2: Induce substantial population growth directly during project operations. (*Less than Significant*)

The geographic scope for the analysis of impacts during project operations is the three-county region consisting of Monterey, San Benito, and Santa Cruz Counties. The analysis assumes that workers needed to staff project operations could be drawn from within this region. Although it is more likely that workers would be drawn from areas of northern Monterey County, western San Benito County, and southern Santa Cruz County than from the more distant areas of the counties, data are not readily available for sub-county regions; therefore, the geographic scope incudes the entire three counties.

During MPWSP operations, approximately 25 to 30 facility operators and support personnel would operate the MPWSP Desalination Plant. All other proposed facilities (i.e., the seawater intake system, ASR-5 and ASR-6 Wells, and Carmel Valley Pump Station) would be operated remotely using Supervisory Control and Data Acquisition systems, with periodic visits by existing CalAm personnel for operations review and maintenance. It is likely that existing plant operators would be retrained to operate the desalination facility, or operators would be drawn from the existing labor pool in Monterey County and potentially Santa Cruz and San Benito Counties, and would not attract workers from outside the region. However, conservatively assuming that the regional labor force could not meet the operational workforce requirements, up to 30 new employees relocating to the area would represent a 0.01 percent increase in workers residing in Monterey County (i.e., 0.01 percent of the labor force) in 2015. This incremental increase would not constitute substantial population growth in the region. Similarly, compared to the projected rate of growth of the county's labor force, an increase of 30 new employees would be minor. The county's labor force is projected to increase by 5,600 workers between 2010 and 2015; 30 new employees would represent 0.5 percent of this projected increase. The proposed project would not involve construction of new homes that would directly induce population growth, or, with the exception of the MPWSP Desalination Plant (addressed above), new places of employment in the area.

Therefore, operation of the proposed project would not directly induce a substantial increase in the local population as it would not require a substantial increase in the local workforce to support project operations, and the direct growth-inducing impact of the proposed project would be less than significant.

Mitigation Measures

None proposed.

4.19.6 Cumulative Effects of the Proposed Project

Impact 4.19-C: Cumulative impacts related to population and housing. (*Less than Significant*)

As discussed above in Section 4.19.5, the proposed project would have no impact related to the displacement of substantial numbers of housing units or people. Therefore, the project would not cause or contribute to a cumulative impact associated with the displacement of housing units or people that would necessitate the construction of replacement housing. The cumulative analysis focuses on the project's contribution to direct cumulative growth effects resulting from construction and operational labor force needs.

Cumulative Impacts During Project Construction

The geographic scope for the analysis of direct cumulative growth inducement impacts during project construction is the three-county region consisting of Monterey, San Benito, and Santa Cruz Counties. This analysis takes a projections based approach, utilizing projections contained in the counties' general plans and related background and environmental review documents. Because Santa Cruz County's general plan was adopted in 1994 and includes projections to 2005, this analysis includes projections contained in its 2015 Housing Element and in the Sustainable Santa Cruz County Plan, which the county adopted in 2014.

- The Monterey County General Plan EIR utilizes Association of Monterey Bay Area Governments' (AMBAG's) 2004 regional forecast, which projects that Monterey County's population will grow from 432,600 in 2005 to 602,700 in 2030, and projects that the number of housing units in the county will increase from about 140,175 units in 2006 to 187,000 units by 2030. Jobs in the county are projected to increase from 238,972 in 2005 to 335,381 by 2030 (Monterey County Resource Management Agency, 2010).
- The San Benito County General Plan Background Report cites AMBAG's 2008 regional forecast, which projects that San Benito County's population will grow from 62,400 in 2010 to nearly 95,000 by 2035. Jobs in the county are projected to increase from 17,400 in 2010 to 21,700 by 2035, and about 13,500 housing units are projected to be added over the same period (San Benito County, 2010).
- The 1994 Santa Cruz County General Plan EIR states that the county had a population of 229,734 in 1990 and 93,700 jobs (not counting self-employed workers), which was projected to increase to 130,700 jobs in 2005. Including self-employed workers, the number of jobs was projected to increase from 104,900 jobs in 1990 to 146,400 in 2005 (Santa Cruz County, 1993). The County's 2015 General Plan Housing Element cites AMBAG's 2014 forecasts, which projects the county population will grow by about 11 percent between 2010 and 2035. The Housing Element indicates that according to AMBAG's Regional Housing Need Allocation, a total of 3,044 new housing units need to be added in the county between 2014 and 2023 (Santa Cruz County, 2016). The County's Sustainable Santa Cruz County Plan, adopted in 2014, also cites AMBAG projections, which indicate that county's population is projected to increase from 262,382 in 2010 to 308,582 in 2035. The number of housing units in the County is projected to increase from 104,476 in 2010 to 120,196 in 2035, and over this same period, 6,150 jobs were expected to be added (Santa Cruz County, 2014).
- The analyses of the cumulative population and housing impacts in the Monterey County and San Benito County General Plan EIRs conclude that because general plans are intended to accommodate future growth, they would have a significant unavoidable growth inducing impact. The 1993 EIR for the Santa Cruz County General Plan concludes that the growth inducing impact of the alternatives evaluated would be less than significant. The 2015 initial study and negative declaration prepared for the 2015 Santa Cruz County Housing Element states that the housing element update is a policy document with an objective of accommodating projected population growth within existing development areas; that the growth inducing impact of the housing element would be less than significant; and that the housing element would have no potentially significant cumulative effects.

The cumulative analysis is based on projected buildout identified in the general plans of the three counties. Although we do not know the timing of the many individual projects that would be constructed under buildout of the counties' general plans, it would be over many years – over the period explicitly covered by the general plans or, frequently, longer. As discussed under Impact 4.19-1, MPWSP construction could generate up to 345 concurrent construction jobs during the four-month peak construction period and from 90 to 280 jobs during the other 20 months of construction.

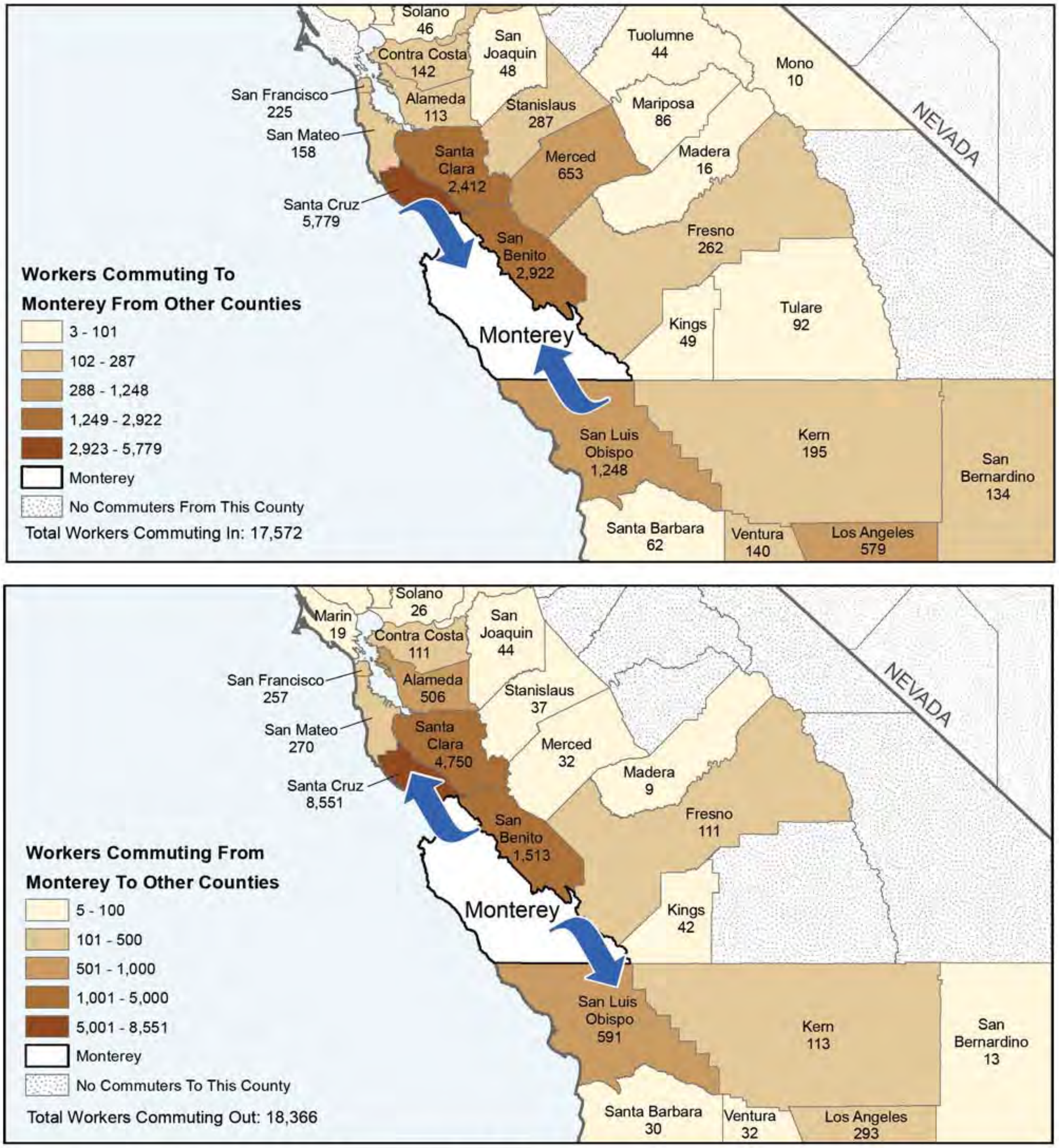
Construction jobs are temporary, and construction workers in a region typically commute from their residences to temporary construction jobs elsewhere in the region, rather than relocating to the vicinity of the job site. To illustrate out-of-county commuting that occurs for all jobs in the region, **Figures 4.19-1**, **4.19-2**, and **4.19-3** show estimates of county-to-county commuting flows for Monterey, San Benito, and Santa Cruz Counties. Based on the U.S. Census Bureau's American Community Survey estimates for years 2006 to 2010, the figures show that a substantial number of residents in the region commute to jobs in other counties. As discussed above in Section 4.19.1.2, about 3,400 construction jobs were lost in Monterey County between 2006 and 2011 and construction employment has not returned to pre-recession levels. In 2015, there were still 2,100 fewer construction jobs in the county than in 2006. Nor has construction employment in neighboring San Benito and Santa Cruz Counties recovered to pre-recession levels. These employment numbers reflect the availability of construction workers that are not reflected in current construction job numbers. Since the recession, some of these workers may be working in less desirable jobs and are assumed to return to construction work if jobs were available.

Because of the limited duration of construction jobs and the size of the regional construction workforce, the construction workforce in Monterey, San Benito, and Santa Cruz Counties is expected to accommodate demand of the cumulative projects for construction labor. It thus appears that there would be no significant cumulative impact on population and housing from construction of cumulative projects. Even if cumulative construction projects were to lead to population and housing effects by attracting some workers to move to the area from outside the region, such moves, and associated effects, would likely be temporary. In any event, the contribution of the MPWSP would be less than significant because of the relatively small number of construction workers required and the short duration of the construction period. Therefore, the cumulative impact of MPWSP construction would be less than significant.

Cumulative Impacts during Project Operations

The geographic scope for the analysis of direct cumulative growth inducement impacts during project operations is the three-county region consisting of Monterey, San Benito, and Santa Cruz Counties. The analysis assumes that workers needed to staff project operations could be drawn from within this region. Although it is more likely that workers would be drawn from areas of northern Monterey County, western San Benito County, and southern Santa Cruz County than from the more distant areas of the counties, data are not readily available for sub-county regions; therefore, the geographic scope includes the entire three counties.

This analysis takes a projections based approach using projections contained in the counties' general plans and related background and environmental review documents, and, for Santa Cruz County, the Sustainable Santa Cruz County Plan, which the county adopted in 2014. Refer to the summary of projections included in the plans under the discussion of construction impacts, above. The cumulative analysis is based on projected buildout identified in the general plans of the three counties. Although we do not know the timing of the many individual non-residential projects that would commence operations under buildout of the counties' general plans, it would occur over many years. The timeframe during which MPWSP operations could contribute to a cumulative population and housing impact would be the approximately 40-year operations phase.



Total Workers That Live And Work in Monterey: 158,479

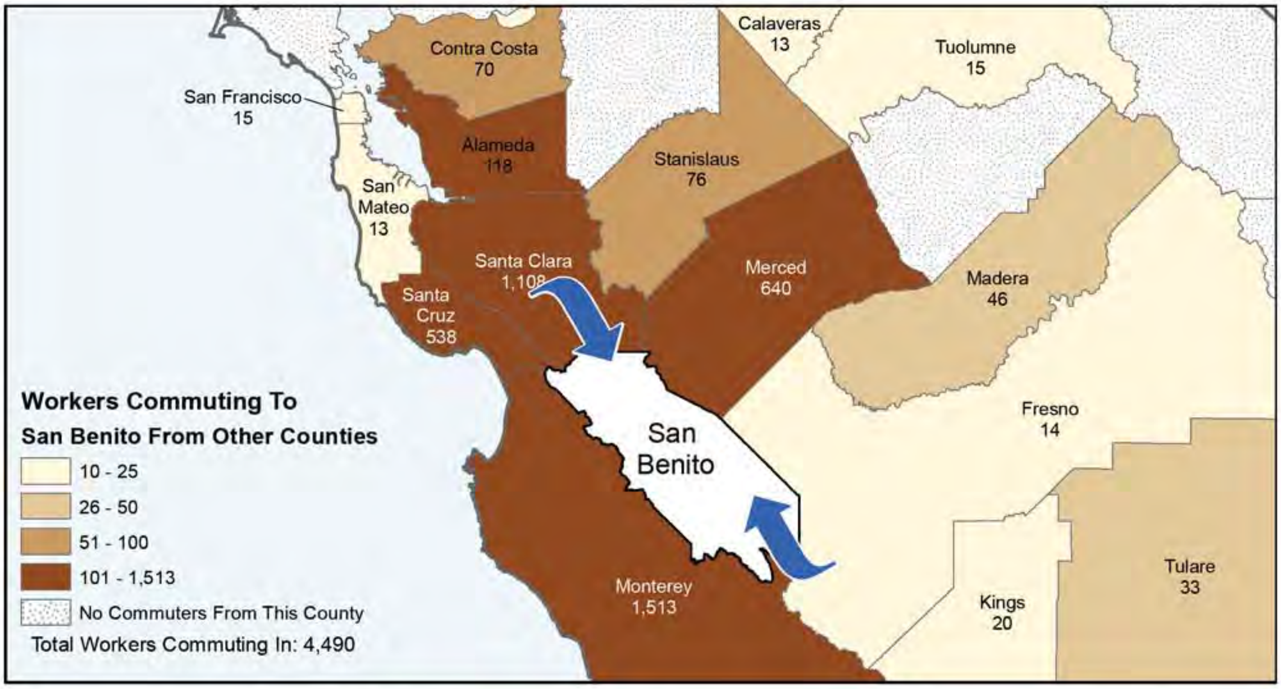
Data Source:
Special Report of 2006 to 2010 County-to-County Commuting Flows,
American Community Survey, U.S. Census Bureau,
report released January 2013

Cartography by:
Labor Market Information Division
California Employment Development Department
March 2015

SOURCE: California Employment Development Department, 2015

205335.01 Monterey Peninsula Water Supply Project

Figure 4.19-1
County to County Commuting Estimates:
Monterey County



Total Workers That Live And Work in San Benito: 12,213

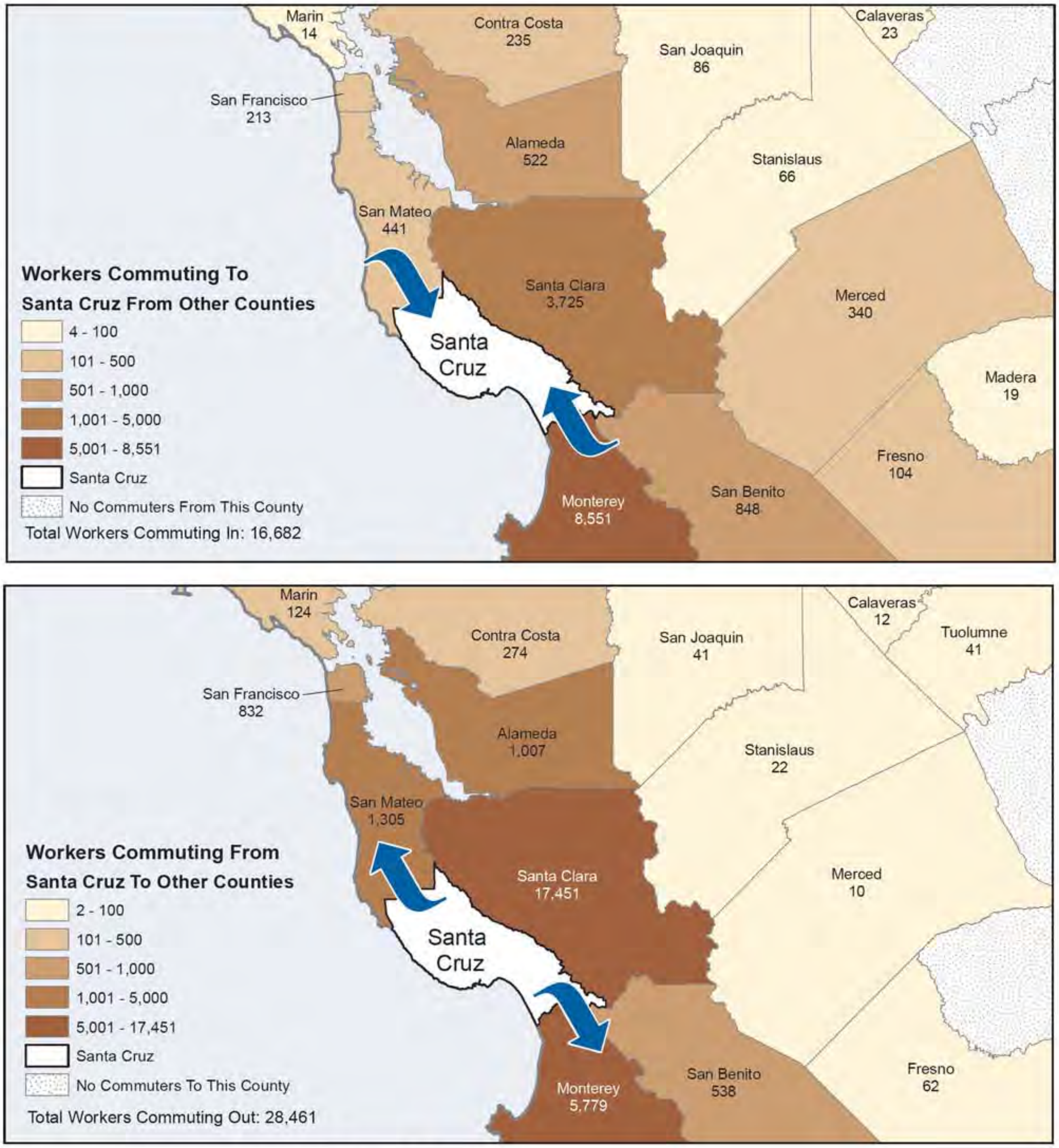
Data Source:
Special Report of 2006 to 2010 County-to-County Commuting Flows, American Community Survey, U.S. Census Bureau, report released January 2013

Cartography by:
Labor Market Information Division
California Employment Development Department
February 2015

SOURCE: California Employment Development Department, 2015

205335.01 Monterey Peninsula Water Supply Project

Figure 4.19-2
County to County Commuting Estimates: San Benito County



Total Workers That Live And Work in Santa Cruz: 93,245

Data Source:
Special Report of 2006 to 2010 County-to-County Commuting Flows, American Community Survey, U.S. Census Bureau, report released January 2013

Cartography by:
Labor Market Information Division
California Employment Development Department
February 2015

SOURCE: California Employment Development Department, 2015

205335.01 Monterey Peninsula Water Supply Project

Figure 4.19-3
County to County Commuting Estimates: Santa Cruz County

According to the California Economic Development Department, in 2015, Monterey County had a labor force of 221,400 workers and an unemployment rate of 8.1 percent (i.e., there were 203,500 employed and 17,900 unemployed workers in the county). San Benito County had a labor force of 29,800 and an unemployment rate of 7.6 percent in 2015 (27,500 employed and 2,300 unemployed workers in the county), and Santa Cruz County had a labor force of 144,200 and an unemployment rate of 7.5 percent (133,400 employed and 10,800 unemployed workers in the county). The unemployment rates in Monterey, Santa Cruz and San Benito Counties are higher than the 2015 statewide average for California (5.3 percent) and higher than recent estimates by the Federal Reserve Board of a long-term normal rate of unemployment (which ranged from 4.6 to 5 percent) (Federal Reserve Board, 2016).[4] The three counties' relatively high unemployment rates suggest that a substantial number of jobs could be accommodated by the regional labor pool.

In addition, the three counties' general plans and related planning documents project employment and population growth over the period that the MPWSP would be in operation, as summarized above under Cumulative Impacts during Project Construction. The general plans are designed to accommodate anticipated job growth and housing for new workers. AMBAG's current growth forecast, adopted in 2014, projects that more than 40,000 jobs will be added in Monterey County alone between 2010 and 2035 (AMBAG, 2014).

Given the size of the regional work force, current unemployment rates in Monterey, San Benito, and Santa Cruz counties, and the size of the currently unemployed workforce, labor demand associated with the cumulative projects is expected to be accommodated by workers in the region. To the extent that new workers would move to the area from outside the region in response to employment opportunities provided by non-residential development in the three counties, there is no evidence to suggest that any such in-migration would be inconsistent with job growth projected and planned to occur under the three counties' general plans, and housing is also planned to accommodate such new workers. The California Regional Housing Need Allocation program specifically requires jurisdictions to accommodate their fair share of anticipated housing needs. A key purpose of General Plan housing elements is to demonstrate that jurisdictions have the capacity to accommodate anticipated housing needs.

Because the population and housing that could be induced by operation of cumulative projects is expected to be consistent with growth anticipated in the counties' general plan documents, the cumulative impact during project operations would be less than significant. As discussed above in Impact 4.19-2, the MPWSP's operational workforce demands would be nominal: 25 to 30 people relative to the total estimated workforce and unemployment rate in the region. Even in the unlikely event that the population and housing induced by operation of cumulative projects was significant, in no event would the proposed project make a cumulatively considerable contribution to any such effect and the project's impact would be less than significant.

[4] The estimates were provided by participants of the Federal Open Market Committee in the committee's June 2016 Summary of Economic Projections. Some level of unemployment is expected even with a healthy, dynamic economy, as workers switch jobs, new workers enter the labor market, and other workers leave it (Federal Reserve Board, 2016).

The potential for the MPWSP to indirectly support growth by providing additional water supply is addressed in Section 6.3, Growth Inducement.

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4.20 Socioeconomics and Environmental Justice

This section evaluates the potential socioeconomic effects of the proposed project, including direct and indirect effects on economic activities, employment, tourism, research, and education. Environmental justice topics addressed include disproportionately high and adverse impacts on minority and low-income populations. This section analyzes the distributional patterns of minority and low-income populations on a regional basis and characterizes the distribution of such populations as they relate to the proposed project. Please note that other related topics, including population and housing, are addressed in Section 4.19, and growth inducement is addressed in Section 6.3.

Under NEPA (42 United States Code [USC] § 4321 et seq.), a federal lead agency must consider social and economic effects if they are related to a proposed project's natural or physical effects. The *CEQ Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 Code of Federal Regulations [CFR] Parts 1500-1508) defines "effects" to include economic and social factors, whether direct, indirect, or cumulative in nature (40 CFR 1508.8). Consequently, federal agencies must analyze a proposed project's economic and social impacts resulting from any natural or physical effects on the environment. Furthermore, Executive Order (EO) 12898 (59 FR 7629; Feb. 16, 1994), *Federal Actions to Address Environmental Justice in Minority and Low Income Populations,* requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations.

As described in Section 4.20.2.2, below, a CEQA Lead Agency may use information about the economic or social impacts of a project to determine the significance of physical changes caused by the project, but the economic or social effects of a project are not treated as significant effects on the environment. Additionally, CEQA does not use the term "environmental justice" or require the evaluation of impacts on minority or low-income communities in the way required by EO 12898. The Office of the California Attorney General (OAG) has clarified that environmental justice concerns are relevant to the analysis of a project under CEQA, but has recommended that lead agencies address environmental justice by evaluating whether a project's impacts would affect a community whose residents are particularly sensitive to the impact (i.e., sensitive receptors) and whether a project would have significant effects on communities when considered together with any environmental burdens those communities already are bearing, or may bear from probable future projects (i.e., cumulative impacts) (OAG, 2012).

The impacts of this proposed project on sensitive receptors are analyzed where appropriate (e.g., in Section 4.10, Air Quality, and in Section 4.7, Hazards and Hazardous Materials). The proposed project's impacts considered together with existing or foreseeable environmental burdens experienced by nearby communities are analyzed throughout Chapter 4 in the Cumulative Effects subsection of each resource section. Further, the OAG indicates that a lead agency must be clear and transparent in its Statement of Overriding Considerations about the balances it has struck in approving a project, such as whether the benefits of the project will be enjoyed widely, but the environmental burdens of a project will be felt particularly by the neighboring communities (OAG, 2012). The information presented in this section will inform such a statement if and when the proposed project is approved in the event that a significant unavoidable impact is identified under CEQA. Significance determinations in this section, however, do not apply to the CEQA analysis. Rather, the conclusions in this section are relevant only to the NEPA analysis of the proposed project.

4.20.1 Setting/Affected Environment

The proposed project would be located along the northern coast of Monterey County (see **Figure 3-2** in Chapter 3) and would provide water supplies for CalAm's Monterey District service area (Monterey District), which includes the cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside. The Monterey District also extends into unincorporated areas of northern Monterey County (the Carmel Highlands, Pebble Beach, Carmel Valley, and the Del Monte Forest) and the Monterey Regional Airport. Although the cities of Castroville and Marina are outside of the Monterey District, these cities could be affected by construction activities. Therefore, the study area includes these cities as well as the county and the analysis below presents demographics for all of the aforementioned cities.

4.20.1.1 Socioeconomics

Employment

Key employment data include the number of employable residents (i.e., the available labor force) and the number of job opportunities (i.e., employment) within a community. Indicators of economic health of the study area include both jobs and the unemployment rate. **Table 4.20-1** shows labor force and unemployment data for the potentially affected jurisdictions and **Table 4.20-2** shows projected employment growth for these areas in terms of number of jobs into the future.

As shown in **Table 4.20-1**, Monterey County's current unemployment rate is 2.7 percentage points higher than the statewide unemployment rate. The overall unemployment rate within the Monterey District is about one percentage point lower than the countywide rate, though unemployment rates within individual jurisdictions vary widely. The jurisdiction with the highest unemployment rate is Sand City, which has an unemployment rate more than double that of Monterey County.

TABLE 4.20-1
LABOR FORCE AND UNEMPLOYMENT FOR POTENTIALLY AFFECTED JURISDICTIONS (2015 ANNUAL AVERAGE)

Jurisdiction	Labor Force[a]	Unemployment Rate[b]
Carmel-by-the-Sea	1,800	3.6%
Del Rey Oaks	1,000	6.0%
Monterey	15,700	5.8%
Pacific Grove	9,000	5.1%
Sand City	200	16.1%
Seaside	18,400	8.3%
Unincorporated Area[c]	9,520	8.1%[c]
Total for Monterey District[d]	***55,620***	***6.9%***
Marina	12,000	6.1%
Castroville CDP	3,200	13.4%
Monterey County	221,400	8.1%
State of California	19,100,900	5.4%

NOTES:
[a] EDD provides rounded labor force numbers, but calculates the unemployment rate before rounding.
[b] Not seasonally adjusted.
[c] An estimated 4.3 percent of the countywide population resides in the unincorporated portions of the Monterey District service area. Because EDD reports local data only at the City or Census Designated Place (CDP) level, the labor force for the unincorporated portion of the Monterey District was estimated as 4.3 percent of the county total. The unemployment rate in the unincorporated portions of the Monterey District is assumed to be equivalent to the Monterey County rate.
[d] Monterey District numbers are estimated based on the aggregate of EDD data for incorporated cities and estimates of unincorporated area data (see note c).

SOURCE: EDD, 2016

As shown in **Table 4.20-2**, 2010 employment data indicate that approximately 182,000 jobs were located in Monterey County. The largest proportion of these jobs was in the city of Monterey (approximately 15 percent). Seaside and Pacific Grove are also major employment centers in the Monterey District.

Between 2010 and 2035, AMBAG projects a countywide increase in employment of 22 percent. Substantial job growth is projected in all cities within the Monterey District service area. The long-term employment forecasts show more robust future growth. Note that the economic fluctuations experienced during the recession are typical of any economy, and the economic forecasting approaches employed by AMBAG account for such cyclical conditions.

Regionally Important Economic Sectors

The Monterey County Board of Supervisors has adopted four economic "pillars" as potential opportunities for the County Economic Opportunity Committee to facilitate economic and employment growth: agriculture, tourism, education, and research (Monterey County, 2016a).

TABLE 4.20-2
PROJECTED EMPLOYMENT GROWTH FOR POTENTIALLY AFFECTED JURISDICTIONS
(2010 – 2035)

Jurisdiction	Number of Jobs					% Growth (2010 – 2035)
	2010	2020	2025	2030	2035	
Carmel-by-the-Sea	2,282	2,645	2,716	2,793	2,875	26.0%
Del Rey Oaks	414	640	602	592	573	38.4%
Monterey	26,934	31,249	32,512	33,597	34,828	29.3%
Pacific Grove	8,792	10,161	10,499	10,827	11,194	27.3%
Sand City	1,561	1,839	1,873	1,908	2,500	60.2%
Seaside	7,790	8,828	9,092	9,344	9,628	23.6%
Unincorporated Area[b]	7,826	8,857	9,082	9,309	9,552	22.1%[c]
Total for Monterey District	***55,599***	***64,219***	***66,376***	***68,370***	***71,150***	***28.0%***
Marina	4,951	5,727	6,191	7,242	8,305	67.7%
Monterey County	182,000	205,977	211,218	216,486	222,137	22.1%

NOTES:

[a] AMBAG does not provide data or estimates for unincorporated Castroville, and no other recent source of the estimated number of jobs in Castroville was identified. The 2007 Castroville Community Plan estimated that Castroville had 1,550 industrial jobs and anticipated that this number would double by 2027, a 3.3 percent annual growth rate. This document did not identify numbers of jobs or anticipated growth rates for other industries (Monterey County Housing and Redevelopment Office, 2007).

[b] An estimated 4.3 percent of the countywide population inhabits the unincorporated portions of the Monterey District service area. As a result, projected employment growth for the unincorporated portion of the Monterey District was estimated as 4.3 percent of the county total.

[c] The rate of current and future employment in the unincorporated portions of the Monterey District service area is assumed to be comparable to the Monterey County rate.

SOURCE: AMBAG, 2014

Agriculture

The agriculture industry as a whole includes crop and animal production, forestry, fishing, and hunting. In 2015, the Monterey County Agricultural Commissioner reported that crop and animal production provided 23.7 percent of all jobs in the County and contributed 18.5 percent of the County's direct economic output and $8.1 billion in total economic output (Monterey County Agricultural Commissioner, 2015). Crop and animal production, the largest portion of the agriculture industry is discussed in Section 4.16, Agricultural Resources, and forestry is discussed and dismissed as a topic of relevance to the proposed project in Section 4.1.2.1.

Commercial fishing represents a substantially smaller portion of the agriculture industry, in 2012 providing about 450 full- and part-time jobs in Monterey County (0.2 percent of total County employment) and contributing $55.9 million in total economic output (0.7 percent of the agricultural sector as a whole) (Office of National Marine Sanctuaries, 2014). No specific information on hunting as part of the agriculture sector is provided by Monterey County; however, like forestry, hunting is not expected to be a topic of concern for the proposed project, and is not discussed further in this section.

Tourism and Hospitality

Tourism and hospitality is one of the major industries in Monterey County, contributing over $2 billion per year in economic output and employing about 13 percent of workers in the County (Dean Runyan Associates, 2015; Monterey County, 2010). Recreational opportunities in Monterey County attract visitors. There are a variety of recreational resources throughout Monterey County—from federal preserves to state beaches and small neighborhood parks. These resources include Monterey Bay National Marine Sanctuary (MBNMS), along with designated parks, trails, and open spaces that provide for a diversity of active and passive recreational opportunities. Public access to the area's unique natural resources is an important component of recreation in Monterey County. The Monterey Bay shoreline hosts one of the most significant and rare dune landforms on the west coast. Public access to beaches, dunes, and hiking trails is available from numerous locations along the coast. There are also several designated bikeways throughout the project area that serve as both recreational facilities and alternative transportation routes. Recreational resources are addressed in Section 4.8, Land Use, Land Use Planning, and Recreation.

Education

Fourteen percent of the overall labor force in Monterey County works in education (Monterey County, 2010). Monterey Bay marine science institutions represent a large portion of the overall economy, supporting 2,343 jobs as of 2016 (Monterey County, 2016b). Examples of educational institutions that are located within or have programs in Monterey County include California State University Monterey Bay, Monterey Peninsula College, Hartnell College, Hopkins Marine Station (Stanford University), Marine Advanced Technology Education Center, Moss Landing Marine Laboratories, and the University of California Santa Cruz.

Research

The Monterey Bay is home to numerous marine and environmental science experts and institutions concentrated in this region due in part to the unique ecosystem of the Bay (Monterey County, 2016c). Most of the educational institutions and programs listed above are focused on or provide research opportunities specific to the region's ecology. MBNMS, in particular, collaborates with over 30 research institutions and is a leader in marine science. MBNMS addresses resource management needs for information, and oversees SIMoN, the Sanctuary Integrated Monitoring Network. In addition to MBNMS' research program, there are numerous research activities conducted by a variety of agencies and organizations such as Monterey Bay Aquarium Research Institute and Hopkins Marine Station. As of 2016, Monterey Bay marine science institutions employ over 2,000 scientists and staff and have a combined annual budget of $337 million (note that some of this employment and economic impact overlaps with the education sector described above) (Monterey County, 2016d).

4.20.1.2 Environmental Justice

The U.S. Environmental Protection Agency (USEPA) defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, sex, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies." The purpose of the environmental justice analysis is to determine whether the environmental and human health-related impacts of the proposed project and alternatives would disproportionately affect minority and low-income populations. To determine whether there would be any proposed project environmental impacts that could disproportionately affect communities of concern, all of the individual resource issue area analyses in EIR/EIS Sections 4.2 through 4.19 were evaluated. Both individual physical effects, cumulative effects, and potential aggregate or additive effects among different issue areas were reviewed. Only Section 4.10, Air Quality, described impacts that could result in a disproportionately high and adverse impact on minority and/or low-income populations.

This environmental justice section provides a discussion of environmental justice in accordance with EO 12898 and related CEQ guidance.

Minority Populations

According to the federal CEQ guidance for environmental justice analyses, "Minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent; or (b) the minority population percentage of the affected area is meaningfully greater than the majority population percentage in the general population or other appropriate unit of geographic analysis. … A minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds" (CEQ, 1997). As explained in the following paragraphs, only the first threshold (greater than 50 percent) is relevant in determining whether the affected communities have minority populations because Monterey County has a minority population greater than 50 percent, and any minority population "meaningfully greater" than (in this case considered to be 1.5 times that of) the Monterey District's 38.6 percent also would be greater than 50 percent.

Table 4.20-3 presents the minority population for potentially affected areas of Monterey County. Consistent with the CEQ guidance cited in the previous paragraph, the minority population for a community consists of the aggregate of all non-white individuals as well as all Hispanic or Latino individuals (i.e., of both white and non-white racial origin).

Seaside, Marina, and Castroville have minority populations of more than 50 percent. Additionally, an analysis of minority population by census tract identified one census tract in Sand City (Census Tract 140) that has a minority population of 64.7 percent. These communities are therefore considered communities of concern for the environmental justice analysis.

Low-Income Populations

This analysis uses two methods for identifying communities of concern related to income levels, based on two sets of guidelines: CEQ guidance and California Regional Water Management Guidelines. Both of these methods are addressed below.

The CEQ environmental justice guidance states that "…low-income populations in an affected area should be identified with the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty" (CEQ, 1997, p. 25). USEPA guidance (1998) recommends the use of Census data on poverty income as one indicator,

TABLE 4.20-3
MINORITY POPULATIONS OF POTENTIALLY AFFECTED GEOGRAPHIES (2010-2014)

Geography	Total Population	Minority Population[a]	Minority Population Percentage
Monterey District[b]			
Carmel-by-the-Sea	3,807	735	19.3%
Del Rey Oaks	1,727	478	27.7%
Monterey (city)	28,053	8,936	31.9%
Pacific Grove	15,365	3,572	23.3%
Sand City	355	156	43.9%
Seaside	33,729	23,197	68.8%
Del Monte Forest CDP	6,439	1,542	23.9%
Balance of District[c]	16,862	2,474	14.7%
Total for Monterey District	***106,337***	***41,090***	***38.6%***
Other Geographies			
Castroville CDP	6,226	5,984	96.1%
Marina	20,198	12,602	62.4%
Monterey County	424,927	289,164	68.1%
State of California	38,066,920	23,161,319	60.8%

NOTES
[a] Includes all individuals other than non-Hispanic white. These values were calculated by subtracting the non-Hispanic white-only population from the total population for each jurisdiction/geography.
[b] Not all cities in this list are located entirely within the Monterey District.
[c] In the absence of more precise information, the balance of the Monterey District population is approximated by the populations of Census Tracts 107.02, 116.02, 116.04, 117, and 134. It is noted that these tracts include areas outside of the Monterey District.

SOURCE: U.S. Census Bureau, 2014c.

as well as other available data. Unlike the CEQ guidance on minority populations, none of the environmental justice guidance documents contain a quantitative definition of what proportion of low-income individuals defines a low-income population. The annual statistical poverty thresholds are based on family income. A threshold of 50 percent of individuals in families with incomes below the poverty threshold (similar to the 50 percent threshold used to identify a minority population) would be an overly restrictive threshold for identifying a low-income population due to the nature of the poverty thresholds, which are not adjusted for regional costs of living, and are below levels commonly considered low-income in many areas of California.[1] For the purposes of this environmental justice analysis, the method of identifying low-income populations within the study area must account for regional costs of living. Therefore, this analysis uses a comparative approach and identifies a low-income population if the proportion of people with family incomes below the poverty threshold is meaningfully greater than that within the general population; in other words, if the percentage of such people in any of the communities

[1] Poverty thresholds vary according to a household's size and composition. The census poverty threshold for a two-parent household with two children was $24,008 in 2014 (U.S. Census Bureau, 2014e). By comparison, CalAm's Low-Income Ratepayer Assistance program defines the low-income threshold for a four-person household as $48,500 (CalAm, 2015a). Only 110 of about 8,000 census tracts (just over 1 percent) in California had 50 percent or more individuals in families with incomes below the poverty threshold (U.S. Census Bureau, 2014f).

considered is 1.5 times (or more than) that of the general population. Both Monterey County and the Monterey District are considered in the context of the general population.

Table 4.20-4 indicates that approximately 17.2 percent of people in Monterey County and 11.5 percent of people in the Monterey District had incomes below the federal poverty threshold. Therefore, based on the definition described above, a community with 17.3 percent (1.5 times 11.5 percent) or greater of people in families with incomes below the federal poverty threshold are identified as low-income populations for the purposes of this analysis. The Monterey District is used for this purpose because it provides a lower, and therefore more inclusive, threshold for defining a community as low-income. Using the county's percentage for this purpose would exclude all of the communities from consideration as low-income communities of concern, and therefore would not provide a meaningful basis for comparing impacts on low-income communities and non-low-income communities. As shown in **Table 4.20-4**, Sand City, Seaside, and the Castroville CDP had greater than 17.3 percent of families with incomes below the poverty threshold.

TABLE 4.20-4
INCOME CHARACTERISTICS FOR POTENTIALLY AFFECTED GEOGRAPHIES (2010-2014)

Geography	Median Household Income[a]	Individuals with Family Income Below Poverty Threshold
Monterey District[a]		
Carmel-by-the-Sea	$62,460	7.9%
Del Rey Oaks	$101,250	6.2%
Monterey (city)	$64,772	9.9%
Pacific Grove	$70,230	7.8%
Sand City	$34,659	25.6%
Seaside	$52,538	18.8%
Del Monte Forest CDP	$102,396	8.1%
Balance of District[b]	$106,826	5.5%
Average for Monterey District [c]	***$74,391***	***11.5%***
Other Geographies		
Castroville CDP	$50,000	21.5%
Marina	$53,828	16.7%
Monterey County	$58,582	17.2%
State of California	$61,489	16.4%

NOTES:
a Not all cities in this list are located entirely within the Monterey District.
b In the absence of more precise information, the balance of the Monterey District population is approximated by the populations of Census Tracts 107.02, 116.02, 116.04, 117, and 134. It is noted that these tracts include areas outside of the Monterey District.
c Income characteristics of Monterey District service area are assumed to be the average of communities found within this area (weighted average of individuals with incomes below poverty).

SOURCE: U.S. Census Bureau, 2014d.

Additionally, California's Integrated Regional Water Management[2] guidelines provide criteria for identifying "disadvantaged communities" during water resources planning efforts. Under the California Water Code, a disadvantaged community is defined as one with an annual median household income that is less than 80 percent of the statewide median household income (California Water Code, Section 79505.5[a]).

As shown in **Table 4.20-4**, the State of California's median household income as reported by the 2010-2014 American Community Survey was $61,489. Therefore, communities with a median income of less than $49,191 would be considered disadvantaged communities.

Among the geographies in Table 4.20-4 only Sand City had a median income of less than $49,191, making it a disadvantaged community in accordance with the California Water Code definition. Additionally, an analysis of income level by census tract identified one census tract in the city of Monterey (downtown; Census Tract 127) that meets the state income criteria for disadvantaged communities.

For this environmental justice analysis, Sand City, Seaside, Castroville CDP, and the downtown Monterey census tract are considered to represent low-income communities of concern.

4.20.2 Regulatory Framework

4.20.2.1 Federal Regulations

Executive Order 12898: Environmental Justice

As mentioned in the introduction to this section, EO 12898 (59 FR 7629; Feb. 16, 1994), *Federal Actions to Address Environmental Justice in Minority and Low Income Populations*, directs federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations.

Specifically, EO 12898 requires that:

> Each Federal agency shall conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under such programs, policies, and activities, because of their race, color, or national origin.

2 Integrated Regional Water Management is a collaborative effort to manage all aspects of water resources in a region. Integrated Regional Water Management crosses jurisdictional, watershed, and political boundaries; involves multiple agencies, stakeholders, individuals, and groups; and attempts to address the issues and differing perspectives of all the entities involved through mutually beneficial solutions.

Council for Environmental Quality Environmental Justice Guidance

The CEQ coordinates federal environmental efforts and works closely with agencies and other White House offices in the development of environmental policies and initiatives. The Presidential Memorandum accompanying EO 12898 stipulates that "each Federal Agency shall analyze the environmental effects, including health, economic and social effects, of federal actions, including effects on minority communities and low-income communities, when such analysis is required by NEPA." Accordingly, the CEQ has developed guidance to assist federal agencies with their NEPA procedures so that environmental justice concerns are effectively identified and addressed. The CEQ's *Environmental Justice Guidance under the National Environmental Policy Act* advises agencies to consider the composition of the affected area; determine whether minority populations, low-income populations, or Indian tribes are present in the area affected by the proposed project; and, if such populations exist, determine whether there may be disproportionately high and adverse environmental effects on these populations (CEQ, 1997).

Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks

EO 13045 (62 FR 19885; Apr. 23, 1997), *Protection of Children from Environmental Health Risks and Safety Risks*, stipulates that to the extent permitted by law and consistent with the agency's mission, each federal agency shall prioritize the identification and assessment of environmental health risks and safety risks that may disproportionately affect children; and shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. As EO 13045 notes:

> A growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks. These risks arise because: children's neurological, immunological, digestive, and other bodily systems are still developing; children eat more food, drink more fluids, and breathe more air in proportion to their body weight than adults; children's size and weight may diminish their protection from standard safety features; and children's behavior patterns may make them more susceptible to accidents because they are less able to protect themselves (§1-101).

This EIR/EIS assesses environmental health and safety risks that may disproportionately affect children in Sections 4.7, Hazards and Hazardous Materials, and 4.10, Air Quality. Regarding whether the proposed project would emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school, see Impact 4.7-4 in Section 4.7. Schools are considered sensitive receptors for hazardous materials because children are more susceptible than adults to the effects of hazardous materials. See Table 4.7-2 in Section 4.7.1.5 for a list of schools within 0.25 mile of project components.

Regarding the proposed project's potential to have adverse health risks that may disproportionately affect children, see Impacts 4.10-1 and 4.10-4 addressing criteria pollutant emissions during construction and operation, respectively, and Impacts 4.10-2 and 4.10-5 addressing exposure of sensitive receptors to substantial pollutant concentrations during construction and operation, respectively. For the purposes of air quality and public health assessments, sensitive receptors are generally defined as land uses with population concentrations that would be particularly susceptible to disturbance from air pollutants associated with MPWSP's construction and/or operation and include children. Sensitive receptor land uses generally include schools, day care centers, hospitals, and residential areas. The analysis of the impact on sensitive receptors relied on the definition of cancer risk, which assumes a six-month exposure for sensitive receptors near the pump station site, with three months of exposure in the third trimester of pregnancy and three months in the 0- to 2-year category. For the ASR-5 and ASR-6 Wells, a 1-year DPM exposure period was used, with three months of exposure in the third trimester of pregnancy and nine months in the 0- to 2-year age category. Therefore, the evaluation of cancer risk takes the health of children into account.

Because Sections 4.7 and 4.10 provide assessments of environmental health and safety risks that may disproportionately affect children, this topic is not addressed further in this section.

4.20.2.2 State Regulations

California Government Code

While there is no legal requirement to address environmental justice issues under CEQA, the State of California—following the adoption of EO 12898—passed a series of environmental justice regulations. California Government Code Section 65040.12 defines environmental justice as the "fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies."

Legislative and executive actions related to environmental justice in California have been largely procedural, including but not limited to the formation of environmental justice advisory committees and the assignment of coordinating roles and responsibilities to the Governor's Office of Planning and Research and the California Environmental Protection Agency.

California Environmental Quality Act

Per CEQA guidelines Section 15131, "Economic or social information may be included in an EIR or may be presented in whatever form the agency desires." The section continues:

a) Economic or social effects of a project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.

b) Economic or social effects of a project may be used to determine the significance of physical changes caused by the project. […] Where an EIR uses economic or social effects to determine that a physical change is significant, the EIR shall explain the reason for determining that the effect is significant.

c) Economic, social, and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce or avoid the significant effects on the environment identified in the EIR. […]

Senate Bill No. 936, Chapter 482

Under existing law, the CPUC has regulatory authority over public utilities, including water corporations. Existing law authorizes the CPUC to fix just and reasonable rates and charges. The existing Monterey Peninsula Water Management District Law establishes the MPWMD and provides for its powers and purposes.

SB 936 authorizes the CPUC to issue financing orders to facilitate the recovery, financing, or refinancing of water supply costs, defined to mean reasonable and necessary costs incurred or expected to be incurred by a qualifying water utility. This bill authorizes the MPWMD to issue water rate relief bonds if the CPUC finds that the bonds will provide savings to water customers on the Monterey Peninsula. Savings from these bonds would result from the lower interest rates that would apply to this financing compared to market-rate financing.

4.20.2.3 Local Regulations

Settlement Agreement on MPWSP Desalination Plant Return Water

On June 14, 2016, a settlement agreement was reached between Cal Am and several parties to the proceeding before the CPUC (CalAm et al., 2016). Under this agreement, the Castroville Community Services District (CCSD) will purchase water at a discounted cost pursuant to Item 4, Payment Provisions:

> (a) CCSD shall pay a rate intended to represent its avoided cost to produce groundwater to meet customer demand, currently estimated to be $110 per acre-foot, which will be the rate as of the beginning of the Delivery Term, for Return Water made available for delivery to meet the Annual Return Water Obligation. CCSD plans to continue operation of its existing wells so they may be available in emergency circumstances. This continuing operation will enable CCSD to provide future updates to the avoided cost of pumping to CalAm upon CalAm's reasonable request, but not more than once per year.

4.20.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to socioeconomics and environmental justice if it would:

- Substantially reduce the rate of employment or the total income or business activity in Monterey County; or
- Change any social, economic, physical, environmental, or health conditions so as to result in a disproportionately high and adverse effect on minority or low-income populations.

Significance determinations in this section apply to the NEPA analysis only.

As described above, OAG indicates that a CEQA lead agency must be clear and transparent in its Statement of Overriding Considerations about the balances it has struck in approving a project, such as whether the benefits of the project will be enjoyed widely, but the environmental burdens of a project will be felt particularly by the neighboring communities (OAG, 2012). The information presented in this section will inform such a statement if and when the proposed project is approved.

4.20.4 Approach to Analysis

4.20.4.1 Socioeconomics

The CEQ's regulations for implementing the procedural provisions of the NEPA (40 CFR Parts 1500-1508; reprinted in CEQ, 2005) provide standards for addressing social and economic impacts in preparing an environmental impact statement. Consistent with these regulations, this analysis examines potential impacts with respect to employment and local economic conditions. Generally, effects that result in greater employment or income, or that otherwise improve the quality of life for the local population, are considered beneficial socioeconomic impacts. This analysis considers the short-term socioeconomic effects that could occur in the project area during the MPWSP's construction period, and the long-term effects that could occur in the Monterey District service area associated with the MPWSP's future operations and debt repayment.

4.20.4.2 Environmental Justice

The USEPA guidance states that the analysis of environmental justice should determine if the affected area of minority population and/or low-income population is subject to "disproportionately high and adverse human health or environmental effects" from the proposed project. The guidance suggests that a comparative analysis be performed of potential impacts on the affected population and a reference population to determine the type of high and adverse impacts and the extent of disproportionality (USEPA, 1988).

For purposes of this analysis, the potential for disproportionately high and adverse impacts on minority and low-income populations was assessed applying USEPA's Guidance for Incorporating Environmental Justice Concerns in USEPA's NEPA Compliance Analysis.

Whether an adverse effect is "disproportionately high" on minority and low-income populations depends on whether that effect is (1) predominantly borne by an environmental justice population, or (2) will be suffered by the environmental justice population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-environmental justice population. It is important to note that determinations of disproportionately high and adverse effects take into consideration the mitigation measures that are identified for the proposed project.

4.20.5 Direct and Indirect Effects of the Proposed Project

TABLE 4.20-5
SUMMARY OF IMPACTS – SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Impacts	Significance Determinations
Impact 4.20-1: Reductions in the rate of employment, total income, or business activity in Monterey County.	LSM
Impact 4.20-2: Disproportionately high and adverse effects on low-income or minority populations.	LS
Impact 4.20-C: Cumulative impacts related to socioeconomics and environmental justice.	LSM

NOTES:
LS = Less than Significant impact, no mitigation proposed
LSM = Less than Significant with implementation of mitigation

4.20.5.1 Socioeconomics

Impact 4.20-1: Reductions in the rate of employment, total income, or business activity in Monterey County. (*Less than significant with mitigation*)

Project Construction

MPWSP construction activities and spending would result in temporary new local employment opportunities and increased spending on construction materials, equipment, and services. The extent to which the construction spending would benefit Monterey County's economy would depend on the proportion of employment, goods, and services procured from local residents and businesses. The greater the proportion of construction labor, materials, and equipment sourced from the project area, the greater the local benefits of the increased economic activity. Conversely, if most of the labor and materials were imported from outside of Monterey County, then project-related construction spending would have a relatively minor benefit on the regional economy.

CalAm's construction spending would represent a net gain to the Monterey County economy. In addition, State Revolving Fund debt and public financing would represent a net gain to the economy in the short term. Therefore, the proposed project would result in a direct, minor, beneficial economic impact on the Monterey County economy.

In addition to the direct effects identified above, secondary economic effects could also result from subsequent "re-spending" by construction companies and materials suppliers that occurs when these companies spend their earnings from the projects at other businesses (i.e., a multiplier effect), and re-spending by employees of those companies. This re-spending would also affect local businesses. The magnitude of the MPWSP construction's indirect economic benefits would depend on the proportion of the labor, materials, and services sourced from the local economy. If a large proportion of the materials and equipment is highly specialized (and must be obtained from suppliers outside of Monterey County), then the construction spending would primarily benefit other economies. The magnitude of the induced economic benefits from construction would depend on the extent to which the workers and businesses in Monterey County that perform the construction activities in turn spend their earnings at other local businesses. As acknowledged in Section 4.19, Population and Housing, some construction workers are expected to commute to the project area from outside of Monterey County. Accordingly, the employment and re-spending benefits related to those workers primarily would be experienced in their home counties.

A formal input-output analysis to estimate the indirect and induced economic impacts was not performed. However, given the relatively specialized nature of the desalination technology and other related water conveyance facilities, it is expected that a relatively small proportion of the highly technical project components would be sourced from within Monterey County. Common materials, such as pipes, grading materials, and excavation equipment, would primarily be sourced from the regional area of Monterey County. As described in Section 4.19, Population and Housing, furthermore, the majority of construction labor would be drawn from the local and regional labor pool. During the construction period up to 370 construction workers would be employed. The indirect and induced economic benefits for Monterey County would be relatively minor, but would represent an indirect beneficial economic impact on the Monterey County economy.

Construction of the proposed project would not have adverse effects on the tourism, research, and education industries in Monterey County. While shifts in spending would potentially affect the retail and hospitality industries, visitors to Monterey County would not be deterred from visiting because construction would be temporary in nature, and impacts would be less than significant. Access for tourists to businesses like retail and dining as well as recreational opportunities may be temporarily impacted by pipeline construction, which would temporarily affect access to streets, parking spaces, and trails. Although pipeline construction would proceed at a rate of 150 to 250 feet per day, the total duration of disturbance at any one location would generally be 1 to 2 weeks. This could result in a significant impact on some individual businesses in the affected locations. However, implementation of **Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan)**, would reduce this potential impact by requiring implementation of circulation and detour plans to minimize impacts on local streets, implementing a public information program to provide advance notice to businesses, residents, and visitors, and restoring roads and streets to normal operation by covering trenches with steel plates outside of normal work hours or when work is not in progress. This measure would reduce this impact to less than significant.

No offshore construction is proposed and construction of the project components would not interfere with any research activities being conducted along the coast. MBNMS oversees the operation of numerous monitoring activities with the sanctuary, but no monitoring was identified as occurring close enough to project construction for these activities to be affected (SIMoN, 2016). As described in Section 4.13, Public Services and Utilities, no impact on educational facilities would occur.

Operational and Facility Siting Impacts

The total capital cost to build proposed project components is estimated to be $337.9 million. These costs would be covered by CalAm equity, State Revolving Fund debt, surcharge on water users, and financing through water rate relief bonds as described under Senate Bill 936 in Section 4.20.2.2. Implementation of the MPWSP would double the current water rates for ratepayers within CalAm’s Monterey District (Truong, 2016). This increase would be phased in over a period of several years.

While the savings achieved by the water rate relief bonds in-lieu of market-rate financing would reduce the overall costs to ratepayers compared to other financing mechanisms, such a utility cost increase could represent an adverse economic impact on the spending power of some ratepayers in Monterey District. Although these consumers could spend less at Monterey County businesses as a result of the increased water rates, such an incremental reduction in spending would not be large enough to constitute a significant adverse effect on overall employment or business activity in Monterey County. The potential impact of this proposed rate increase on low-income individuals and communities is analyzed under Impact 4.20-2 (environmental justice).

Operation of the proposed project would not affect access to tourism, education and research industries. Tourism relies on the recreation, retail and travel sectors, and would not be impacted by the proposed project. Access to research environments would not change as a result of the project. Instead, the project would support the long-term economic stability of these industries in Monterey County. It would improve water conveyance infrastructure and water supply in the CalAm Monterey District. This would increase reliability of water supply for all economic sectors in Monterey County. Overall, impacts of operation would be less than significant.

4.20.5.2 Environmental Justice

Impact 4.20-2: Disproportionately high and adverse effects on low-income or minority populations. (*Less than significant*)

Project Construction

Low-income and minority populations are defined in Section 4.20.1.4 and include all or portions of Sand City, Seaside, Castroville, Monterey (downtown), and Marina. To determine whether there were any proposed project environmental impacts that could disproportionately affect these communities of concern, all of the individual resource issue area analyses in Sections 4.2 through 4.19 of this EIR/EIS were evaluated. In reviewing each of these sections, this environmental justice analysis considers potential impacts and mitigation measures and whether a "disproportionately high and adverse" (CEQ, 1997) impact would result for the minority or low-income populations identified. Only Section 4.10, Air Quality, described impacts that could result in a disproportionately high and adverse impact on minority and/or low-income populations. The review of the impact analysis in Chapter 4 also considered the potential for resource impacts to aggregate or combine to create disproportionately high effects on communities of concern. The analysis determined that the temporary, localized, and low-level (less than significant) characteristics of impacts related to environmental health or environmental burdens other than air quality would not result in a substantial aggregation of effects or a disproportionately high and adverse effect disproportionately affect minority or low-income populations.

Health effects resulting from decreased air quality, specifically on minority or low-income populations, are location-based and dependent on the varying components of the proposed project. **Table 4.20-6** provides the estimated maximum daily construction emissions of ROG, NOx, CO, PM_{10}, and $PM_{2.5}$ that would potentially result from MPWSP components that would be located closest to the communities of concern. These components are displayed on **Figure 3-2** and listed in **Table 4.10-5**, Estimated Maximum Daily Construction Emissions.

TABLE 4.20-6
MAXIMUM DAILY CONSTRUCTION EMISSIONS SCENARIOS IN STUDY AREA COMMUNITIES (pounds/day)

Location	Nearby Project Components in Maximum Daily Emissions Scenario	Estimated Maximum Daily Emissions				
		ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Minority and Low-Income Communities						
Monterey, Sand City	None	--	--	--	--	--
Seaside	ASR Pipelines ASR Injection/Extraction Wells	3.92	51.1	29.83	2	1.65
Castroville	Castroville Pipeline	2.39	27.59	17.61	1.19	1.06
Marina	Subsurface Slant Wells Source Water Pipeline New Desalinated Water Pipeline	8.80	113.20	61.84	4.59	3.93
Other Communities in Study Area						
Carmel-by-the-Sea, Pacific Grove	None	--	--	--	--	--
Del Rey Oaks/ Unincorporated County	Ryan Ranch-Bishop Interconnection Improvements	2.34	26.99	17.21	1.18	1.04
MBUAPCD Significance Thresholds		**137**	**137**	**550**	**82**	**55**

SOURCE: See Appendix G; MBUAPCD, 2016.

As shown in Table 4.20-6, none of the maximum daily emissions scenarios near each of these communities would exceed the Monterey Bay Unified Air Pollution Control District (MBUAPCD) significance thresholds (described in detail in Section 4.10). However, of the communities with identified low-income and minority populations, Seaside and Marina would experience emissions more than twice as high as those that would occur in Del Rey Oaks and the unincorporated Ryan Ranch area. If these emissions near minority and low-income populations resulted in an adverse effect, this would have the potential to be a disproportionately high and adverse impact compared to the impact on non-minority or low-income populations.

Table 4.10-1, Ambient Air Quality Monitoring Summary (2011–2015), shows that existing pollutant concentrations have been relatively low compared to existing standards. Although **Table 4.10-5** shows that total project construction emissions would exceed applicable regulatory thresholds, those total emissions would be distributed across the various project components located in different parts of the project area, as illustrated by Table 4.20-6, and would not be concentrated in one location at any time. The site-specific emissions that would result from construction in any given location would be well below project-specific thresholds and would not substantially contribute to localized concentrations of criteria pollutants such that localized exceedances of standards would occur. Construction emissions would be temporary in nature and would not raise ambient air pollutant concentrations over time. Although several of the identified minority and low-income communities would experience higher emissions than would other communities (due to the amount of construction contributing to the estimate of maximum daily emissions near each community), emissions from construction would not result in substantial adverse health effects because they would be temporary and would not exceed applicable thresholds. Therefore, because construction of project components would not result in substantial adverse effects, the project would not result in a disproportionately high and adverse impact on minority and/or low-income communities, and the impact would be less than significant. Additionally, implementation of **Mitigation Measures 4.10-1a** through **4.10-1e** would reduce project construction emissions further.

Operational and Facility Siting Impacts

As is the case with construction, air quality is the only issue area that could result in a disproportionately high and adverse impact on minority and/or low-income communities. However, as described in Impact 4.10-4, combined operational emissions of the MPWSP Desalination Plant, Carmel Valley Pump Station, and the slant wells would not exceed any of the thresholds derived from applicable air quality plans; therefore, operational emissions would not be expected to adversely affect the communities' health.

As discussed above, development and operation of the proposed project would result in higher water rates for most ratepayers within CalAm's Monterey District, which includes the identified low-income populations in Sand City, Seaside, and downtown Monterey. Such increases could have an adverse impact on low-income populations, and because low-income ratepayers may be less able to absorb price increases compared to non-low-income ratepayers, this adverse impact could be disproportionately high, and thus significant. However, under CalAm's Help to Others (H_2O) program, low-income water customers within the CalAm service area can apply to receive water rates that are discounted by approximately 20 percent for the meter rate and for the first two tiers of residential quantity rates (CalAm, 2015a, b, 2016a). This program is expected to continue and would help offset impacts on low-income ratepayers from future water rate increases resulting from implementation of the proposed project. Further, CalAm provides assistance through payment arrangements to customers who cannot pay bills by the due date, as well as water conservation assistance including: "water wise" house calls for homeowners and renters to identify water conservation opportunities, free water-saving devices (e.g., showerheads, faucet aerators), landscape water audits and budgets, and rebates for purchasing and installing water-saving devices (CalAm 2016a, b, c). These customer assistance programs are consistent with USEPA's recommendation to water and wastewater utilities to provide such programs to address the economic needs of low-income customers (USEPA, 2016). These programs would reduce the burden of increased prices on low-income households in the Monterey District to the extent practicable. CPUC jurisdiction over CalAm's water rates includes oversight by the Office of Ratepayer Advocates, whose statutory mission pursuant to California Public Utilities Code Section 309.5 is to obtain the lowest possible rate for service consistent with reliable and safe service levels, and to consider primarily the interests of residential and small commercial customers. For these reasons, this impact is would be less than significant.

The Castroville Community Services District (CCSD), which serves nearly 2,000 water connections (including government, industrial, commercial, and residential customers) in Castroville, a disadvantaged community and identified low-income community outside of CalAm's Monterey District, currently relies on about 780 acre-feet per year of SVGB groundwater to meet Castroville's water demands, with all of its three domestic water production wells in the 400-Foot aquifer (CCSD, 2017). CCSD increasingly has experienced water supply challenges due to water quality degradation primarily from increased salinity, as illustrated in Figure 4.10-11 (CalAm et al., 2016).

As described in Section 4.20.2.3, above, the settlement agreement would allow CalAm to deliver desalinated water to CCSD at a rate equal to the avoided cost of pumping the same amount of water. Therefore, CCSD would benefit from the proposed project because it would receive higher-quality water for the same price that pumping degraded water otherwise would cost. This would be a minor beneficial effect for a disadvantaged community.

4.20.6 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects.

Impact 4.20-C: Cumulative impacts related to socioeconomics and/or environmental justice. (*Less than significant with mitigation)*

Socioeconomics

The geographic scope for the cumulative impact analysis of socioeconomics encompasses Monterey County.

As described in Impact 4.20-1, project construction would economically benefit the communities in the project area. No communities in the vicinity of the project area would experience negative socioeconomic impacts resulting from construction. Access for consumers to some businesses may be temporarily affected. Potential disruptions would last a maximum of 2 weeks at any given location, and none of the linear projects in Table 4.1-2 that could have similarly disruptive construction effects would overlap in time and location with proposed project construction. Therefore, no cumulative impact is anticipated, and the impact of the proposed project alone would be as described above, less than significant with mitigation.

Construction projects listed in Table 4.1-2 and MPWSP construction activities and spending would result in temporary new local employment opportunities and increased spending on construction materials, equipment, and services. Consequently, the proposed project and other projects in the cumulative scenario would have a net positive economic and employment effect on the communities benefitting from proposed project construction. As acknowledged in Section 4.19, Population and Housing, some construction workers are expected to commute to the project area from outside of Monterey County. Accordingly, the employment and re-spending benefits related to those workers primarily would be experienced in their home counties, and would combine with cumulative impacts affecting those counties. The proposed project would have a beneficial contribution to such cumulative impacts outside the geographic scope for this analysis.

Environmental Justice

The geographic scope for the cumulative impact analysis of environmental justice includes the minority and low-income communities identified in Section 4.20.1.2: Seaside, Marina, Castroville, and Sand City, and one census tract in downtown Monterey.

Project construction would occur in Seaside, Marina, and Castroville. Ambient air quality in this area, as described in Section 4.10.1.5, reflects the past and ongoing contributions of criteria air pollutant emissions from numerous sources, including the CEMEX sand mining facility, existing Monterey Regional Water Pollution Control Agency (MRWPCA) facilities, existing Monterey Peninsula Regional Waste Management District (MPWMD) facilities, and livestock ranching and other agricultural activities. Section 4.10.1.5 describes baseline criteria air pollutant concentrations based on data from the nearest ambient air quality monitoring station, which has not recorded any violations of the state or federal criteria air pollutant standards from 2011 through 2015. Although localized project emissions in these communities would not exceed significance thresholds, four other projects have the potential to be under construction near proposed project components in these communities at the same time. As described in Table 4.1-2, these are the remaining retail and housing components of The Dunes on Monterey Bay in Marina (No. 7), the Marina Downtown Vitalization Specific Plan (No. 10), Marina Station (No. 12), and the Main Gate Specific Plan in Seaside (No. 18). The construction schedules for these projects are unknown, but if construction of these projects were to overlap with the construction of the proposed project, the cumulative localized emissions could be increased compared to the proposed project alone. Although cumulative impacts could be significant if other projects resulted in emissions that exceeded significance thresholds, the proposed project's localized emissions as shown in Table 4.20-6 would not be significant. Therefore, for the same reasons described in the air quality analysis in Section 4.10.6, the proposed project's contribution to cumulative impacts at these locations would be less than significant. With regard to operational effects, as discussed in Impact 4.10-6, such emissions would be negligible. (*Less than significant*)

Implementation of the MPWSP would result in a long-term increase in water rates for ratepayers within CalAm's Monterey District that would be phased in over a period of several years. However, CalAm is proposing in their current General Rate Case (A.16-07-002) to increase rates by 15 percent for its Monterey District. The implementation of the MPWSP would double the current water rates for ratepayers within CalAm's Monterey District (Truong, 2016). Although the Monterey Pipeline and Pump Station are identified as a separate project in the cumulative scenario (No. 60 in Table 4.1-2), this estimate of doubling the rates is based on CalAm's Amended Application, which assumed the cost of these facilities to be included (ESA, 2016). Therefore, no additional increase would occur as a result of implementation of the Monterey Pipeline and Pump Station project. Additionally, it is assumed that the GWR Project (No. 59) will not move forward in the full project buildout, and therefore is not included in the cumulative scenario for the proposed project. No other projects in Table 4.1-2 would result in additional rate increases because they would be carried out and funded by organizations other than CalAm. The cumulative impact in the Monterey District from the MPWSP and general rate case proceeding is an increase in rates of approximately 115 percent. This could have a disproportionate impact on low-income ratepayers, but for the same reasons described for the proposed project in Section 4.20.5.2, this impact is considered to be less than significant. Additionally, no other projects are expected to affect water supply to or prices paid by the CCSD, so a cumulative analysis is not relevant to the project's benefits on CCSD.

As discussed above, individual physical effects, cumulative effects, and potential aggregate or additive effects among different issue areas were reviewed. The analysis throughout the issue areas determined that the temporary, localized, and low-level (less than significant) characteristics of impacts related to environmental health or environmental burdens other than air quality would not result in a substantial aggregation of effects or a disproportionately high and adverse effect on minority or low-income populations. As described in this section, the proposed project's contribution to cumulative environmental justice impacts within the geographic scope of analysis would be less than significant.

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CHAPTER 5
Alternatives Screening and Analysis

5.1 Introduction and Overview

This chapter describes the methodology used to identify and screen alternatives to the proposed project, compares the environmental impacts of the alternatives against the proposed project, and identifies the CEQA environmentally superior alternative and the NEPA environmentally preferable alternative and agency preferred alternative.

- ***Sections 5.1.1*** and ***5.1.2*** describe the guidelines for alternatives analysis under CEQA and NEPA, and the process by which the alternatives presented in this EIR/EIS will be carried forward and presented in the EIR/EIS for analysis. ***Section 5.1.2*** restates the proposed project objectives and significant impacts, and discusses their relevance in the alternatives review process.
- ***Section 5.2*** presents and discusses other water supply alternatives that were considered and may have informed the formulation of the alternatives analyzed in this EIR/EIS, but were not carried forward for detailed evaluation in this EIR/EIS.
- ***Section 5.3*** describes the process employed to develop, screen and evaluate potential alternative components in order to develop whole alternatives to the MPWSP for analysis.

Section 5.3.1 describes the regulatory considerations applicable to the successful implementation of a desalination project and **Section 5.3.2** describes the two-step screening and evaluation process for components of whole alternatives. After the individual components are described and screened to determine feasibility in step 1 (**Sections 5.3.3** through **5.3.5**), the components that are carried forward are evaluated against each other (step 2) in **Section 5.3.6.** Components that are considered to be the least environmentally damaging are then combined into "whole" alternatives in **Section 5.4**. Components that are not carried forward are described, with the reason for their dismissal, in Appendix I.

- ***Section 5.4*** describes a No Project/No Action Alternative and five action alternatives -- which include alternatives to the CalAm proposed project, reduced capacity alternatives, and desalination projects proposed by other entities -- and discusses their ability to meet project objectives.
- ***Section 5.5*** presents the impact analyses of the six whole alternatives (the No Project/No Action Alternative and the five action alternatives) that are described in Section 5.4 and compares those alternatives against the proposed project.
- ***Section 5.6*** identifies the environmentally superior/preferred alternative(s) and the NEPA agency preferred alternative.

5.1.1 Alternatives Analysis – CEQA/NEPA Requirements

One of the most important aspects of the environmental review process is the identification and assessment of the environmental impacts of reasonable alternatives. In addition to mandating consideration of the No Project/No Action Alternative, both the CEQA Guidelines (14 Cal. Code Regs. § 15126.6(d)) and the NEPA Regulations (40 CFR § 1502.14) emphasize the selection of a reasonable range of alternatives that meet the purpose and need of the proposed action, and the comparative assessment of the impacts of the alternatives to allow for public disclosure and informed decision-making.

5.1.1.1 CEQA Requirements

Section 15126.6 of the CEQA Guidelines sets forth the following criteria for selecting and evaluating alternatives:

- ***Identifying Alternatives.*** An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the proposed project but would avoid or substantially lessen any of the significant effects of the project. Factors that may be considered when addressing the feasibility of an alternative include site suitability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, economic viability, and whether the proponent can reasonably acquire, control, or otherwise have access to an alternative site. An EIR need not consider an alternative whose impact cannot be reasonably ascertained and whose implementation is remote and speculative. The specific alternative of "no project" must also be evaluated. Of those alternatives presented, an EIR needs to examine in detail only ones that are determined at a preliminary level to feasibly attain most of the basic objectives of the proposed project.
- ***Range of Alternatives.*** An EIR need not consider every conceivable alternative, but must consider and discuss a reasonable range of feasible alternatives in a manner that will foster

informed decision-making and public participation. The "rule of reason" governs the selection and consideration of EIR alternatives, requiring that an EIR set forth only those alternatives necessary to permit a reasoned choice. The CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives or would be more costly." However, alternatives must also be feasible, and feasible is defined as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."

- ***Evaluation of Alternatives.*** The EIR must evaluate the comparative merits of the alternatives and include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. Matrices may be used to display the major characteristics and the environmental effects of each alternative. If an alternative would cause one or more significant effects not caused by the project as proposed, the significant effects of the alternative must be discussed, but in less detail than the significant effects of the project.

5.1.1.2 NEPA Requirements

NEPA emphasizes that the identification and assessment of alternatives is the heart of the environmental impact statement (40 CFR § 1502.14). NEPA requires the agency to consider the no action alternative, other reasonable courses of action, and mitigation measures that are not already incorporated in the proposed action. Except for the no action alternative, alternatives should meet the purpose and need (40 CFR § 1502.13), and be reasonable, i.e., practical or feasible from the technical and economic standpoint and using common sense. NEPA also requires agencies to consider reasonable alternatives not within the jurisdiction of the lead agency (40 CFR § 1502.14 (c)). Agencies must rigorously explore and evaluate all reasonable alternatives, and briefly discuss the reasons for eliminating alternatives from detailed study. Agencies must provide substantial and detailed treatment to each alternative in the analysis, and impacts of the alternatives should be presented in comparative form in order to sharply define the issues and provide a clear basis for choice to the public and the decision-makers.

5.1.2 Project Objectives and Significant Impacts

As noted in Section 5.1.1.1, the CEQA Guidelines call for evaluating alternatives that would attain most of the basic objectives of the project, but would avoid or substantially lessen any identified significant effects of the project. Under the CEQ regulations for NEPA (40 CFR § 1502.13, Purpose and Need; and 40 CFR §1502.14, Alternatives), an EIS must identify "the underlying purpose and need to which the lead agency is responding in proposing the alternatives including the proposed action" (40 CFR § 1502.13), and present the environmental impacts for the proposed action and each alternative in comparative form, thus defining the issues and providing a clear choice among alternatives for decision-makers and the public (40 CFR §1502.14). Therefore, under the CEQA Guidelines and CEQ regulations, appropriate alternatives for the EIR/EIS analysis are those that would meet most of the basic project objectives (or underlying purpose and need for the project) and are reasonable/feasible. Furthermore, the analysis includes alternatives that would avoid or substantially lessen any of the significant environmental effects of the proposed project. In addition, NEPA does not require a cost-benefit analysis, but allows cost-benefit analysis if it is relevant to the choice among environmentally different alternatives. In this EIR/EIS, economic factors were not used as criteria for selection of the alternatives carried through for detailed analysis. Nevertheless, Section 5.5.20 considers the economic and social impacts of the alternatives resulting from any natural or physical effects on the environment. Other cost factors will be considered by decision-makers as described in Section 1.5.4.

5.1.2.1 MPWSP Objectives, Purpose and Need

The MPWSP is needed to replace existing water supplies that have been constrained by legal decisions affecting the Carmel River and Seaside Groundwater Basin water resources. In 1995, the California State Water Resources Control Board (SWRCB) directed CalAm to reduce and eventually terminate surface water diversions from the Carmel River in excess of its legal entitlement of 3,376 acre-feet per year (afy). SWRCB Order 95-10 directed CalAm either to obtain appropriative rights to the water that was being unlawfully diverted, or to obtain water from other sources. In the meantime, to reduce diversions from the Carmel River to the greatest practicable extent, the order directed CalAm to implement conservation measures to offset demand and to maximize its use of the Seaside Groundwater Basin to serve existing customers. (See Chapter 2 for more information on Order 95-10 and the subsequent Cease and Desist Order, SWRCB Order 2009-0060).

In 2006, the Monterey County Superior Court adjudicated the rights of various entities to use groundwater resources from the Seaside Groundwater Basin. In its decision, the Court established the adjudicated water rights of all the users of the Seaside Groundwater Basin, for the purpose of avoiding long-term damage to the basin. The adjudication substantially reduced the amount of groundwater available to CalAm (from approximately 4,000 afy to 1,474 afy). (See Section 2.2.4 in Chapter 2, Water Demand, Supplies, and Water Rights for more information on the Seaside Groundwater Basin adjudication.)

The need for the proposed MPWSP is predicated on the following:

- SWRCB Order 95-10, which requires CalAm to reduce and terminate surface water diversions from the Carmel River in excess of its legal entitlement of 3,376 afy, and SWRCB Order 2009-0060, which requires CalAm to terminate the diversions in excess of its legal entitlement by December 2021; and
- The Monterey County Superior Court’s adjudication of the Seaside Groundwater Basin, which effectively reduced CalAm’s pumping from the Seaside Groundwater Basin from approximately 4,000 afy at the time of the adjudication to CalAm’s adjudicated right of 1,474 afy.

The purpose and need is thus to comply with these legal requirements while supplying sufficient water to CalAm customers. Project alternatives were evaluated for their ability to fulfill the project purpose and need and meet the basic objectives of the proposed project. The MPWSP objectives (presented in Chapter 1, Introduction) are repeated here for ease of reference:

The primary, or fundamental, objectives of the proposed MPWSP are to:

1. Develop water supplies for the CalAm Monterey District service area to replace existing Carmel River diversions in excess of CalAm's legal entitlement of 3,376 afy, in accordance with SWRCB Orders 95-10 and 2009-0060;
2. Develop water supplies to enable CalAm to reduce pumping from the Seaside Groundwater Basin from approximately 4,000 to 1,474 afy, consistent with the adjudication of the groundwater basin, with natural yield, and with the improvement of groundwater quality;
3. Provide water supplies to allow CalAm to meet its obligation to pay back the Seaside Groundwater Basin by approximately 700 afy over 25 years as established by the Seaside Groundwater Basin Watermaster;
4. Develop a reliable water supply for the CalAm's Monterey District service area, accounting for the peak month demand of existing customers;
5. Develop a reliable water supply that meets fire flow requirements for public safety;
6. Provide sufficient water supplies to serve existing vacant legal lots of record;
7. Accommodate tourism demand under recovered economic conditions;
8. Minimize energy requirements and greenhouse gas emissions per unit of water delivered; and
9. Minimize project costs and associated water rate increases.

The secondary objectives of the MPWSP are to:

1. Locate key project facilities in areas that are protected against predicted future sea-level rise in a manner that maximizes efficiency for construction and operation and minimizes environmental impacts;
2. Provide sufficient conveyance capacity to accommodate supplemental water supplies that may be developed at some point in the future to meet build out demand in accordance with adopted General Plans; and
3. Improve the ability to convey water to the Monterey Peninsula cities by improving the existing interconnections at satellite water systems and by providing additional pressure to move water over the Segunda Grade.

The purpose of the federal proposed action is to authorize otherwise prohibited activities to occur within MBNMS under the National Marine Sanctuaries Act (NMSA), to ensure that the State and Federal permits and the proposed project comply with NMSA regulations, and to ensure that sanctuary resources are protected by identifying terms and conditions that may be necessary. The MBNMS proposed action was prompted by CalAm's request for NMSA authorization and permits to construct, operate, maintain and decommission subsurface seawater intake facilities in the sanctuary and to allow brine discharges through an existing ocean outfall facility within the sanctuary; both activities would be associated with CalAm's proposed desalination plant. Therefore, the need for MBNMS action is to respond to CalAm's request, in accordance with NMSA regulations, and to protect sanctuary resources. This EIR/EIS assesses the environmental impacts of other project alternatives which also involve intakes from and/or discharges into MBNMS which would require authorization from MBNMS.

5.1.2.2 Significant Environmental Impacts

The alternatives to be considered under CEQA and NEPA include those that avoid or substantially lessen one or more of the significant environmental effects identified for the proposed project. Many of the adverse environmental impacts described in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, were determined to be less than significant. Other adverse impacts were determined to be significant, but could be reduced to a less-than-significant level through the implementation of mitigation measures. Still other impacts were found to be significant and unavoidable even with mitigation measures. The consideration of these mitigation measures also satisfies the requirements under NEPA to consider mitigation alternatives, and for MBNMS to consider imposition of additional terms and conditions to the authorizations to minimize impacts on sanctuary resources.

Based on the analysis presented in Chapter 4, mitigation measures would reduce potentially significant impacts to less-than-significant levels for most topical areas, except for: conflict with the City of Marina's Local Coastal Land Use Plan (a terrestrial biology impact), construction noise, air quality during construction, and indirect impacts from growth. Further, the proposed project may result in significant and unavoidable cumulative impacts on transportation and traffic, noise, and air quality during construction.

While the primary focus of the alternatives analysis in this chapter is to develop a reasonable range of alternatives and analyze their impacts on the environment, this chapter also analyzes two other separately proposed water supply projects in the region (DeepWater Desal and the People's Project) for full consideration and comparison among projects currently under NEPA and CEQA review that could satisfy the project objectives and the agencies' purpose and need for action.

5.2 Alternatives Not Evaluated in Detail

This section provides a brief project history, and presents alternative projects that were considered in the past and may have informed the alternatives analyzed in this EIR/EIS, but were not carried forward for detailed evaluation. Many of the alternatives presented below were considered and rejected in earlier environmental review documents because the projects were determined to be politically, legally, economically, or technically infeasible; others are concepts that were speculative or technically or economically infeasible. These projects were revisited for this EIS/EIR and were eliminated from further review because they are incapable of meeting most of the basic project objectives or purpose and need as currently defined. The earlier environmental review documents are incorporated by reference pursuant to NEPA (40 CFR §1502.21) and CEQA Guidelines (Section 15150), and discussed in **Appendix I**. Additionally, Section 5.3 and Appendix I describe individual components, such as particular intake and outfall options, that are eliminated from further detailed analysis.

5.2.1 Overview

The MPWSP is the result of a multi-year planning effort. Since 1989, various entities have proposed several options intended to meet the water supply needs of the Monterey Peninsula and address the impacts on the Carmel River underlying SWRCB Order 95-10. Several of those options generated their own environmental review documents, which in turn contained many alternatives, some of which are still relevant here. As part of the 2009 Coastal Water Project EIR (CPUC, 2009), the CPUC reviewed these previously-prepared documents, including the Monterey Peninsula Long-Term Water Supply Contingency Plan (Plan B) Component Screening Report (CPUC, 2000) and the CPUC Carmel River Dam Alternative Plan B Project Report (CPUC, 2002), to determine what projects and alternatives had already been considered and eliminated since SWRCB Order 95-10 was issued.

The following section summarizes the previous proposals and projects, and the environmental documentation prepared for them (as relevant), and discusses why each of these alternatives is not addressed in detail in this EIR/EIS. No viable alternatives have been identified that would supply water without a desalination plant being included. Therefore, each of the whole action alternatives described in Section 5.4 includes a desalination plant of one size or another at some location within Monterey County.

5.2.2 New Los Padres Dam and Reservoir/Carmel River Dam and Reservoir Project

The New Los Padres Dam and Reservoir project was originally proposed by the Monterey Peninsula Water Management District (MPWMD) in 1989. It included a 24,000-acre-foot (af) dam and reservoir on the Carmel River, located about 0.5 mile downstream of the existing Los Padres Dam. The project would have had a production limit of 21,000 afy, of which 3,381 af would have been available to accommodate growth, in the form of new connections and remodels. The MPWMD prepared the required CEQA documentation in 1994-1995, obtained a

Section 404 permit under the federal Clean Water Act in 1995, and obtained a water right permit from the SWRCB in June and July 1995. However, in November 1995 voters rejected a measure authorizing funding for the project (CPUC, 2009).

In 1996, CalAm proposed to build a "no growth" dam and reservoir to comply with Order 95-10. That proposal was called the Carmel River Dam and Reservoir Project. Physically, it would have been the same as the New Los Padres Dam and Reservoir project. It would only have served existing community needs, which were estimated at 17,641 afy rather than the 21,000 afy envisioned in the New Los Padres Dam and Reservoir project. CalAm applied to the CPUC for permission to build and operate the project (A.97-03-052) in 1997. In 1998, the MPWMD, acting as lead agency, prepared a draft supplemental environmental impact report based on the New Los Padres Dam and Reservoir EIR. MPWMD never certified the final environmental document because, in 1998, the state legislature passed Assembly Bill 1182, which ordered the CPUC to identify alternatives to the dam (CPUC, 2009). In 1999, in response to Assembly Bill 1182, the CPUC began evaluating alternatives to the Carmel River dam project to meet the requirements of SWRCB Order 95-10 (also known as Plan B) for the Monterey Peninsula.

Subsequently, CalAm concluded that the Carmel River dam project was not feasible for a number of factors, including general public opposition, concerns over impacts to endangered and threatened species, and the findings of the evaluation of alternatives in Plan B (see Section 5.2.3). These factors still make both the New Los Padres Dam and Reservoir Project and the Carmel River dam project infeasible.

5.2.3 CPUC Water Supply Contingency Plan ("Plan B")

In 1999, in response to Assembly Bill 1182 and to meet the requirements of SWRCB Order 95-10, the CPUC began evaluating alternatives to the Carmel River dam project. In 2002, the CPUC, working with CalAm and others, completed a water supply contingency plan (also known as Plan B) for the Monterey Peninsula. Plan B ultimately concluded that a combination of desalination and aquifer storage and recovery (ASR) could produce 10,730 afy.[1] The desalination component of the project would be located next to the Moss Landing Power Plant and would produce 9,430 afy. Treated water would flow to the CalAm service area through a new pipeline. The ASR element would provide 1,300 afy by diverting surplus water from the Carmel River and storing this water in the Seaside Groundwater Basin for later use.

As part of the Plan B process, a Component Screening Report was prepared to provide the background, framework, and evaluation of potential Plan B water supply components (CPUC, 2000). Fifteen project components were evaluated in detail to assess their ability to meet 11 Plan B

[1] The Draft Plan B Project Report included a desalination plant at Sand City, Seaside Groundwater Basin ASR, a water reclamation component, and a water rights component. Further analysis, however, determined the following: that the water rights component was not currently feasible due to agency policies; that the water reclamation component was not practical due to institutional complexities and project costs; and that a desalination plant at Sand City would be more difficult to implement and less appropriate for the desired scale of production than a desalination plant at Moss Landing. The Final Plan B Report, therefore, consisted of a Seaside Groundwater Basin ASR and a desalination plant at Moss Landing.

objectives and 16 Plan B criteria. The 15 project components considered in the Plan B screening analysis, and their disposition at the time, sorted by category, are presented in **Table 5.2-1**.

TABLE 5.2-1
RESULTS OF PLAN B COMPONENT SCREENING

Component Category/Component	Carry Forward	Hold	Exclude
Groundwater Development			
1. Carmel Valley Deep Fractured Bedrock Wells		X	
2. Seaside Basin ASR	X		
3. Tularcitos Basin ASR		X	
Desalination			
4. Desalination Plant at Marina		X	
5. Desalination Plant at Moss Landing	X		
6. Desalination Plant at Sand City	X		
Importation			
7. Water Purchase from CVP		X	
8. Water Purchase from Humboldt Bay		X	
9. Water Purchase from the Salinas Valley			X
Legal Strategies			
10. Pueblo Water Rights (Carmel River)			X
11. Pueblo Water Rights (Salinas River)			X
12. Table 13 Rights (Carmel River)		X	
Reclamation			
13. CAWD/PBCSD Reclamation Expansion		X	
14. SVRP Expansion		X	
15. Local Stormwater Reclamation Projects		X	

Of the 15 components, three (water purchase from the Salinas Valley, Pueblo Water Rights for the Carmel River, and Pueblo Water Rights for the Salinas River) were excluded with fatal flaws, and they continue to be infeasible alternatives.

Three of the Plan B components were carried forward for additional evaluation; two of them, Seaside Basin ASR and Sand City Desalination, have been implemented. The Desalination at Moss Landing component was evaluated in the 2009 Coastal Water Project EIR and is re-evaluated in this EIR/EIS.

The other Plan B components were placed in a “hold” category. Components that were put on hold were not as promising as the ones carried forward, due to any number of factors that indicated that implementation of a particular component was technically challenging, did not fulfill planning goals, or conflicted with environmental resources. Water Purchase from the Central Valley is now considered to be infeasible since it relied on the construction of the Import Pipeline by the Pajaro Valley Water Management Agency, which decided not to pursue the project. Table 13 Water Rights and Local Stormwater Reclamation Projects[2] have been or are being implemented; an expansion of the Seaside Basin ASR, Desalination at Marina, and Reclamation components[3] are discussed in this EIR/EIS.

A Final Plan B Project Report was prepared to document the refinement of the most viable components selected during the screening project. Additional engineering design and environmental analysis refined, modified, and focused the results presented in the Plan B Project Report, which provided the technical foundation and point of departure for the analysis of the Coastal Water Project. It included all of the essential features of the project: (a) a desalination project at Moss Landing using the Moss Landing Power Plant cooling water system for feedwater; (b) a water conveyance pipeline from Moss Landing to the CalAm's Monterey District; (c) ASR near Seaside; and (d) storage of Carmel River winter flows at the ASR site for recovery in the summer. At 10,730 afy capacity, Plan B did not include a provision to replace some of the water pumped from the Seaside Basin because the over pumping problem was not recognized at that time.

In 2003, the CPUC dismissed CalAm's Carmel River dam application without prejudice, ordered CalAm to file a new application for the Coastal Water Project, and determined that the CPUC should be the lead agency for the Coastal Water Project EIR. CalAm responded to the CPUC's decision by filing an application for a Certificate of Public Convenience and Necessity (CPCN) (A.04-09-019) and proposing the Coastal Water Project.

5.2.4 Coastal Water Project

In 2004, CalAm filed Application A.04-09-019 seeking a CPCN from the CPUC for the Coastal Water Project. The Coastal Water Project (also referred to as the Moss Landing Project) was sized, like the "no growth" New Los Padres Dam and Reservoir Project, to meet existing water demand, and did not include supplemental supplies to accommodate growth. On January 30, 2009, the CPUC published a Draft EIR analyzing the environmental impacts of the Coastal Water Project, as well as the environmental impacts of two project alternatives: the North Marina Project[4] and the Regional Project.[5] The CPUC published the Coastal Water Project Final EIR (SCH No.

[2] This Plan B component included several small scale stormwater reclamation projects that could be implemented within small drainage basins in Carmel, Pebble Beach and Pacific Grove, Monterey and Seaside.

[3] This Plan B component included an incremental of the CAWD/PBCSD Recycled Water Project and the incremental expansion of the Salinas Valley Reclamation Project.

[4] The North Marina Project alternative included most of the same facilities as the previously proposed Coastal Water Project and, like the previously proposed Coastal Water Project, would only provide replacement supplies to meet existing demand. The key differences between this alternative and the previously proposed Coastal Water Project were that the slant wells and desalination plant would be constructed at different locations (Marina State Beach and North Marina, respectively), and the desalination plant would have a slightly greater production capacity (11 mgd versus 10 mgd).

[5] The Regional Project would have been implemented jointly by CalAm, Marina Coast Water District (MCWD) and Monterey County Water Resources Agency (MCWRA).The Regional Project was to be implemented in phases and included vertical seawater intake wells on coastal dunes located south of the Salinas River and north of Reservation Road; a 10-mgd desalination plant in North Marina (Armstrong Ranch); product water storage and conveyance facilities; and expansions to the existing Seaside Groundwater Basin ASR system.

2006101004) in October 2009 and certified the EIR in December 2009 (Decision D.09-12-017). A year later, in Decision D.10-12-016, the CPUC approved the Regional Project alternative.

In January 2012, after the CPUC approved the Regional Project, CalAm withdrew its support for that project because of potential conflicts among the regional partners, and in April 2012, CalAm submitted Application A.12-04-019 (CalAm, 2012) seeking a CPCN from the CPUC for the MPWSP to build, own, and operate a desalination facility for water supply. The CPUC closed the Coastal Water Project proceeding A.04-09-019 in July 12, 2012, with Decision D.12-07-008. However, certain elements of the three projects evaluated in the Coastal Water Project EIR (e.g., intake, plant location and brine discharge components) have been carried into the alternatives analysis presented in this EIR/EIS.

5.2.5 MCWRA Interlake Tunnel and Spillway Modification Project

The Interlake Tunnel has been under consideration since the late 1970s and was included in the Monterey County Water Resources Agency (MCWRA) July 1991 Water Facilities Capital Plan as an approach to better manage flood and conservation flows in the Salinas River watershed. Since the early 1990s, the MCWRA has focused its groundwater management efforts on completing the Salinas Valley Water Project, which entails the Salinas River Diversion Facility and a modification to the Nacimiento Dam Spillway. More recently, the Interlake Tunnel project was included in the 2013 Greater Monterey County Integrated Regional Water Management Plan. With the current drought, MCWRA has a renewed interest in the Interlake Tunnel and Spillway Modification Project (Interlake Tunnel Project).

The Interlake Tunnel Project is being considered by the MCWRA, and would involve the construction of an 11,000-foot-long tunnel to divert approximately 50,000 afy of water from Nacimiento Reservoir to San Antonio Reservoir that would have otherwise been spilled at Nacimiento Dam. The Nacimiento River basin produces nearly three times the average annual flow of the San Antonio River basin, so capturing high Nacimiento River flows and diverting those flows to San Antonio Reservoir would increase the overall storage capacity of the system (MCWRA, 2014). The spillway of the San Antonio Reservoir would be raised an additional 10 feet to provide a total storage capacity of 59,000 af.

In July 2014, the Monterey County Board of Supervisors approved funding that allowed the MCWRA to prepare for and commence environmental review of the project. Starting in August, 2014, the MCWRA's Board of Directors has held several public workshops to provide background information about the Interlake Tunnel and to provide updates on project activities and accomplishments. On April 28, 2016, MCWRA published a Notice of Preparation to prepare an EIR on the Interlake Tunnel Project and held scoping meetings in May 2016. MWCRA anticipates construction of the Interlake Tunnel Project could begin in 2019.

The Interlake Tunnel project is intended to provide additional flood control and water supply benefits to the existing users and beneficiaries of the MCWRA's benefit assessment Zone 2C.

The project will be funded in part by property owners in Zone 2C through a Proposition 218 assessment. CalAm's Monterey District is not included in Zone 2C. Even if CalAm could overcome the legal and economic challenges of the assessments, the water created by the Interlake Tunnel Project would need to be conveyed to a new Surface Water Treatment Facility (e.g., it could flow down the Salinas River for extraction at the Salinas Valley Water Project's Rubber Dam, and be conveyed to CalAm's Charles Benson Road site) in order to comply with the Surface Water Treatment Rule, before being delivered to CalAm customers.

Demands for water from the Salinas River watershed come from numerous sources, including the Salinas Valley growers, Nacimiento Lake property owners, saltwater intrusion prevention efforts, and environmental protection measures. Given the uncertainty of this resource, the tremendous demand for water to serve a number of different purposes and the Monterey County Agency Act prohibition on out- of-basin transfers of groundwater, it is extremely unlikely CalAm could secure the appropriative surface water rights for this supply (CPUC, 2000). Therefore, this alternative was not further evaluated in this EIR/EIS.

5.2.6 Pure Water Monterey Groundwater Replenishment Project

The Pure Water Monterey Groundwater Replenishment (GWR) Project is jointly sponsored by the Monterey Regional Water Pollution Control Agency (MRWPCA) and the Monterey Peninsula Water Management District (MPWMD); the City of Salinas, the Marina Coast Water District (MCWD), and the Monterey County Water Resources Agency (MCWRA) are also participating. The GWR Project would serve northern Monterey County by providing purified water to recharge the Seaside Groundwater Basin (CalAm may later extract and distribute up to 3,500 afy) and 4,750 afy of additional recycled water to augment the existing Castroville Seawater Intrusion Project's agricultural irrigation supply. On September 15, 2016, in Decision 16-09-021, the CPUC authorized CalAm to enter into a Water Purchase Agreement, which provides that the MRWPCA will sell purified water from its advanced treated Pure Water Monterey GWR Project to the MPWMD, which in turn will sell it to CalAm for extraction and distribution to ratepayers in the Monterey District service area.

The GWR Project is not considered in this EIR/EIS as a stand-alone alternative to the MPWSP because it would not provide enough water to meet the basic project objectives of the MPWSP. Instead, it is considered in the cumulative impacts analysis for the reduced capacity alternative (Alternative 5a and 5b), Alternative 3 (Deepwater Desal) and the No Action Alternative. However, the GWR Project would not be relevant in the context of the proposed project or any alternative that includes a 9.6 mgd desalination plant built and operated by CalAm (i.e., Alternatives 1 and 2) because, if the GWR project is implemented, CalAm would not need to construct a 9.6 mgd desalination plant (the proposed project); instead, it would construct the 6.4 mgd plant as described in Alternatives 5a and 5b.

CPUC Decision 16-09-021 also authorized CalAm to construct the new Monterey Pipeline and Pump Station. For all alternatives (including the proposed project), the approved new Monterey

Pipeline and Pump Station are included in the cumulative impact analysis since those facilities will be built with or without the remainder of the GWR Project elements.

5.2.7 Siting Alternatives for ASR-5 and ASR-6 Wells

Section 2.4.3, Aquifer Storage and Recovery, describes the existing Phase I and Phase II of the Seaside Groundwater Basin Aquifer Storage and Recovery (ASR) project, which entails diverting and conveying Carmel River water during periods of high flow that occur between December and May of each year to the Seaside Groundwater Basin, where it is injected into the aquifer for storage and subsequently recovered for delivery to customers. The Phase I project, which was completed in 2007, includes two ASR injection/extraction wells (ASR-1 and ASR-2) located at the former Fort Ord military base, on the east side of General Jim Moore Boulevard near Eucalyptus Road. The Phase II ASR project includes two additional injection/extraction wells (ASR-3 and ASR-4) at Seaside Middle School, located on the west side of General Jim Moore Boulevard. The Phase I and Phase II ASR well locations are shown on Figure 3-2. In addition to the injection/extraction wells, the Phase I and Phase II ASR facilities include treatment facilities, two pump stations, a backflush percolation basin, and conveyance pipelines.

As part of the MPWSP, CalAm proposes two additional injection/extraction wells, ASR-5 and ASR-6 wells, to be located on the east side of General Jim Moore Boulevard between Arloncourt Road and Ardennes Circle, as shown on Figure 3-9. As discussed in Impact 4.12-1 in Section 4.12, Noise and Vibration, construction of the ASR wells would require a total of 8 weeks of 24-hour construction; and while temporary sound walls would be installed (Mitigation Measures 4.12-1b and 4.12-1d), a nighttime noise control plan would be implemented (Mitigation Measures 4.12-1c), and offsite accommodations would be provided for substantially affected receptors (Mitigation Measures 4.12-1e), the nighttime noise impact on adjacent residents could remain significant and unavoidable.

The locations of the proposed ASR-5 and ASR-6 wells are constrained by the presence of existing infrastructure and geologic characteristics of the Seaside Groundwater Basin. Several potential well sites were considered in environmental analyses completed for the Phase I and Phase II projects, including the “Bayonet Site,” located west of General Jim Moore Boulevard adjacent to the Bayonet and Black Horse Golf Course, and parcels located in Fitch Park near the intersection of General Jim Moore Boulevard and Normandy Road. According to a 2010 Final Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) prepared by the U.S. Army, placement of an ASR well at the Bayonet Site was not pursued because the City of Seaside intended to acquire the site, and the Normandy Road site was not considered a viable site because of its proximity to a school path to Marshall School (U.S. Army, 2010).

Approval of the GWR Project, as described in Section 5.2.6, has further constrained the possible locations for additional ASR wells. New potable supply wells cannot be installed in GWR’s area of influence within the basin because they would draw water from a part of the basin without meeting residence times in the aquifer that are required for GWR’s injected recycled water.

The Lead Agencies reviewed constraint information provided by CalAm and in prior environmental analyses for the Phase I and Phase II projects and concur with their conclusions. Because few locations are technically feasible for alternative siting of the ASR-5 and ASR-6 wells, and due to the temporary nature of the significant and unavoidable nighttime noise impact associated with this project component, these technically infeasible alternatives were not carried forward into the EIR/EIS analysis.

5.3 Component Alternatives Development, Screening and Evaluation Process

The following section describes the alternatives development, screening and evaluation process, and focuses on the basic components of any desalination project: intakes, desalination plants, and outfalls. Section 5.3.1 describes the regulatory considerations applicable to the successful implementation of a desalination project and section 5.3.2 describes the two-step screening and evaluation process for alternative components. After the individual components are described and screened to determine feasibility in step 1 (Sections 5.3.3 through 5.3.5), the components that are carried forward are evaluated against each other in step 2 (Section 5.3.6). Components that are considered to be the least environmentally damaging[6] are then combined into "whole" alternatives in Section 5.4. Components that are not carried forward are described, with the reason for their dismissal, in Appendix I.

5.3.1 Regulatory Considerations

In order to be viable, alternatives must be capable of complying with regulations governing desalination plants in order to receive the required regulatory approvals. A complete list of applicable regulations was provided in Chapter 3, Table 3-8.

In addition, regulators require the design and operation of intakes and outfalls to avoid or minimize adverse environmental impacts. Key guidance that relates to evaluation of alternatives is outlined in SWRCB's policies and the *California Ocean Plan*, California Coastal Commission policies, and NOAA policy guidelines for desalination facilities in MBNMS, described below.

5.3.1.1 State Water Resources Control Board and the California Ocean Plan

The SWRCB is responsible for regulating water resources under the California Water Code and is the state agency authorized to implement the federal Clean Water Act National Pollutant Discharge Elimination System (NPDES) program in California. The SWRCB and its nine Regional Water Quality Control Boards regulate the discharge of pollutants to State waters through the issuance and administration of NPDES permits, which may be combined with state-level permits, called waste discharge requirements that regulate discharges to state waters under the California Water Code.

[6] As discussed above, under NEPA, alternatives selection criteria do not require identification of only those alternatives considered to be the less environmentally damaging than the preferred alternative, but rather a reasonable range of alternatives that fit the purpose and need for action. Analysis should include alternatives (including mitigation alternatives) that are designed to minimize impacts. NEPA requires alternatives to be reasonable, or feasible, which could include consideration of whether the alternative is capable of complying with regulations governing desalination plants in order to receive the required regulatory approval. Furthermore, the purpose and need for the Federal proposed action includes a requirement to ensure that NMSA regulatory requirements are met and that MBNMS resources are protected. Therefore, this criterion for eliminating alternatives from further study that are least environmentally damaging also eliminates alternatives that are infeasible because they are likely to be incapable of complying with the regulatory requirements and do not meet the Federal purpose and need to protect sanctuary resources.

Section 13142.5(b) of the California Water Code requires new or expanded coastal industrial facilities, including desalination plants, to use the "best available site, design, technology, and mitigation measures feasible" to minimize the intake and mortality of marine life. The SWRCB prefers subsurface intakes, but allows surface water intakes where subsurface intakes are not feasible or economically viable. For the purposes of Water Code Section 13142.5(b) and implementation of the Ocean Plan, "feasible" means "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors" as defined in Appendix I of the Ocean Plan. (SWRCB, 2016)

Effective January 2016, the *Water Quality Control Plan for Ocean Waters of California* (or Ocean Plan; SWRCB, 2016) establishes water quality objectives and beneficial uses for waters of the Pacific Ocean adjacent to the California Coast outside of estuaries, coastal lagoons, and enclosed bays. The Ocean Plan establishes effluent quality requirements and management principles for specific waste discharges such as brine discharge from desalination plants. This is discussed in detail in Chapter 4, Section 4.3, Surface Water Hydrology and Water Quality. Concerning brine discharge from a desalination plant, the Ocean Plan requires an owner or operator to first evaluate the availability and feasibility of diluting brine by commingling with wastewater. If wastewater is unavailable, then multiport diffusers are the next preferred method of brine disposal (SWRCB, 2016). These requirements protect beneficial uses by establishing a consistent statewide analytic framework for new desalination facilities for the best available site, design, technology, mixing requirements, and feasible mitigation measures, to minimize intake and mortality of marine life.

As described in the Ocean Plan:

> *The [Ocean Plan] contains four primary components intended to control potential adverse impacts on marine life associated with the construction and operation of desalination facilities as described below. (SWRCB, 2016):*
>
> - *Clarify SWRCB's authority over desalination facility intakes and discharges;*
> - *Provide guidance to the regional water boards regarding the determination required by Water Code section 13142.5, subdivision (b) for the evaluations of the best available site, design, technology, and mitigation measures to minimize the intake and mortality of marine life at new or expanded desalination facilities;*
> - *[Provide] A narrative receiving water limitation for salinity applicable to all desalination facilities to ensure that brine discharges to marine waters meet the biological characteristics' narrative water quality objective*[7] *and do not cause adverse effects on aquatic life beneficial uses.*
> - *Monitoring and reporting requirements that include effluent monitoring, as well as monitoring of water column bottom sediments and benthic community health to ensure that the effluent plume is not harming aquatic life beyond the brine mixing zone.*

[7] The 2016 Ocean Plan Section II. E (biological characteristics water quality objective) requires that, "marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded."

5.3.1.2 California Coastal Commission Guidance and Policies

The California Coastal Commission (CCC) is involved in nearly all coastal desalination proposals through planning, permitting, permit appeals, or other reviews. The CCC report entitled *Seawater Desalination and the California Coastal Act* (CCC, 2004) addresses issues related to desalination along the California coast and potential effects on coastal resources and uses; identifies and discusses California Coastal Act policies that are applicable to desalination facilities; and provides information likely to be required during the coastal development permit review process.

Chapter 5 of the *Seawater Desalination and the California Coastal Act* report (CCC, 2004) outlines Coastal Act environmental policies related to desalination facilities and processes, focusing on marine biology and water quality policies.[8] Applicable coastal policies include the need to protect and enhance marine resources and to protect the biological productivity of coastal waters.

The report identifies a desalination plant's seawater intake and discharge as the two components with the most potential to cause direct adverse impacts on marine life and water quality: desalination facilities that draw water directly from the open ocean can kill many small marine organisms. Subsurface intakes have the advantage of eliminating or minimizing impingement and entrainment, and the CCC encourages applicants to use subsurface intakes whenever feasible if they would not cause significant adverse impacts on beach topography or potable groundwater supplies. Where subsurface intakes would not be feasible, the use of an open-water intake would require mitigation measures to reduce adverse effects or compensatory measures to offset impacts. The CCC recommends that the feasibility of subsurface intakes be considered during the conceptual design stage of a proposal and during environmental review of desalination projects (CCC, 2004). Before the CCC will consider permitting an open-water intake, the proponent must show that a subsurface intake is infeasible. For those projects proposing open-water intakes, up-to-date studies of entrainment and impingement impacts are necessary (Lester, 2006). To address marine biological impacts, the CCC requires design measures, such as a low intake velocity rate of 0.5 feet per second in accordance with the Clean Water Act, velocity limits, and screens. The CCC requires feasibility studies to evaluate the economic, social, and environmental impacts expected from open-water intake operations (CCC, 2004).

5.3.1.3 MBNMS Guidelines for Desalination Plants

MBNMS and NOAA Fisheries, in collaboration with the California Coastal Commission and the Central Coast RWQCB, developed guidelines for discretionary approvals of new desalination facilities in the document entitled *Guidelines for Desalination Plants in the Monterey Bay National Marine Sanctuary* (NOAA, 2010). This document provides non-regulatory guidelines to ensure that future desalination plants in the sanctuary are properly sited and designed, and are operated in a manner that results in minimal impacts on the marine environment. The guidelines address several issues associated with desalination, including site selection, impacts from

[8] The report cautions that this focus should not be construed as treating other coastal resources as less important; rather it assumes that effects on other resources, and conformity review of a desalination facility with other Coastal Act policies, would likely be similar to many other coastal development projects.

construction and operations, plant discharges, and intake systems. Failure to meet these guidelines makes it very difficult for the project to meet the purpose and need for the federal action. Proposed project and alternatives' consistency with the Guidelines are summarized in Table 6.4-1 in Chapter 6, Other Considerations. Key relevant guidelines include:

- Desalination plant proponents should pursue collaborations with other water suppliers and agencies currently considering water supply options in the area to evaluate the potential for an integrated regional water supply project. This should include an evaluation of other potential desalination locations and alternatives, as well as other forms of water supply.
- All desalination plants in MBNMS should be designed and sited to avoid and minimize impingement and entrainment to the extent feasible. The feasibility of using subsurface intakes as an alternative to open-water intake methods should be investigated. Other options for consideration should include: vertical wells and Ranney wells, horizontal directionally drilled and slant-drilled wells, seabed filtration systems, and other sub-seafloor structures. Where feasible and beneficial, subsurface intakes should be used. The implementation of subsurface intakes should not cause saltwater intrusion to aquifers or adversely affect coastal wetlands that may be connected to the same aquifer being used by the intake, and the intake proposal must address the likelihood of increased coastal erosion in the future. Subsurface intakes have the potential to minimize or eliminate impingement and entrainment impacts and improve the performance and efficiency of a desalination project by providing a certain level of pretreatment.
- Where subsurface intakes are not feasible, open-ocean intakes should be sited with existing pipelines of acceptable structural integrity. If new pipelines are necessary, sub-seafloor placement should be evaluated to minimize disturbances to biological resources and to recreational and commercial activities.
- Methods of minimizing impingement and entrainment impacts should be evaluated for open-ocean intakes. These should include design alternatives such as placing the intake structure to avoid sensitive habitat or highly productive areas, screening the intake ports, increasing the number of intake ports, or decreasing the intake velocity. Use of open-ocean intakes should be evaluated to determine expected entrainment and impingement impacts associated with various intake velocities and screen mesh sizes based on long-term monitoring data from the area, including diurnal and seasonal variations in planktonic abundance and location.
- Desalination plant intakes should be sited to avoid sensitive habitats. For open-water intakes, areas of high biological productivity (such as upwelling centers or kelp forests or other dense beds of submerged aquatic vegetation) should be avoided.
- The feasibility of diluting brine effluent by blending it with other existing discharges should be investigated. The proponent should evaluate the use of measures to minimize the impacts from desalination plant discharges, including discharging to an area with greater circulation or at a greater depth, increasing in the number of diffusers, increasing the velocity while minimizing the volume at each outlet, diluting the brine with seawater or another discharge, or use of a subsurface discharge structure.

5.3.2 Component Development and Screening Process

In order to develop alternatives to CalAm's proposed MPWSP, this alternatives analysis begins by describing and screening the key components of the desalination project. To maximize the range of components considered, this EIR/EIS separately considered seawater intake options, desalination plant locations and brine discharge options. The various options include different facility locations and technologies, and in some cases, also consider opportunities for co-locating project facilities with existing infrastructure.

Land-based brine discharge options were not considered or evaluated in this analysis for several reasons, including: the lack of any nearby facility for processing the large volume of liquid brine; the impacts associated with the abundance of truck trips required to move between 12 and 14 mgd of liquid brine to a processing facility (see Section 5.3.4)[9] or other onshore disposal or treatment area; the infeasibility of developing a substantially large area that would be needed for the use of evaporation ponds; the lack of a market for the salt product in California (e.g. as a de-icing agent); the infeasibility of using the very saline brine as irrigation water; the infeasibility of spreading the brine on the farming lands of the Salinas Valley; and the infeasibility of deep well injection due to the seawater intrusion issues currently being faced in the Salinas Valley. Furthermore, recent studies on new brine constituent extraction technologies have raised economic feasibility issues. One such study that summarized recent literature concluded that: "While a significant amount of research has been performed on constituent extraction, there is little consensus on its feasibility at a desalination facility" (Bureau of Reclamation, 2015).

All options in the screening process are sized for a 9.6 mgd desalination plant, but could be adjusted for a 6.4 mgd plant; in either event, the comparison addresses like elements. Each component option is defined and screened; those with fatal flaws were eliminated (see Appendix I) and options carried forward were evaluated.

In eliminating component options, this EIR/EIS considered whether the intake options could provide a sufficient and reliable source of seawater, or whether the outfall options could provide a reliable method of discharge. This EIR/EIS also considered site conditions, the availability of the site, the existing infrastructure, subsurface conditions derived from borehole data (for subsurface intakes), and input from resource agencies. Finally, component options must meet regulatory requirements – for example, if a component would cause a permanent and significant decline in marine species, it would not likely receive regulatory approval. The component options presented below came primarily from the following sources:

- *Application of California-American Water Company (U210W) for Approval of the Monterey Peninsula Water Supply Project and Authorization to Recover All Present and Future Costs in Rates*, A.12-04-019, Before the Public Utilities Commission of the State of California, April 23, 2012, as revised by subsequent CalAm testimony concerning A.12-04-019.
- *Memorandum: Contingency Planning for the MPWSP (Update of November 1, 2012 TM)*, Prepared by RBF Consulting, January 9, 2013.

[9] To move 12 to 14 mgd of brine per day would require between 1,440 and 1,725 tanker truck trips daily.

- *Proposal Submitted by the Moss Landing Commercial Business Park, LLC, to Design and Build the People's Moss Landing Desal Project* (MLBP 2013a), February 15, 2013, provided in response to CPUC Information Request, and Project Details, Project Title: The People's Moss Landing Water Desal, Project Sponsor: Moss Landing Business Park, LLC (MLBP, 2013b), provided in response to CalAm request for information, April 25, 2013.
- *Monterey Bay Regional Water Project, Project Narrative: Supplement to California State Lands Lease Application*, Prepared by DeepWater Desal LLC, Revised February 3, 2016, downloaded from the DeepWater Desal website, www.deepwaterdesal.com/reports-and-publications.htm.
- *Horizontal Well Technology Application In Alluvial Marine Aquifers For Ocean Feedwater Supply And Pretreatment, Section 2, Research And Development For Horizontal/Angle Well Technology*, Prepared by Geoscience Support Services, Inc., September 30, 2008, submitted to California Department of Water Resources.
- Input from regulatory agencies provided during an interagency meeting in Pacific Grove on June 10, 2013.
- Project Descriptions of DeepWater Desal and People's Project, provided by MBNMS, June 2016.

The component screening results for intake options (Section 5.3.3), outfall options (Section 5.3.4) and desalination plant sites (Section 5.3.5) are presented below.

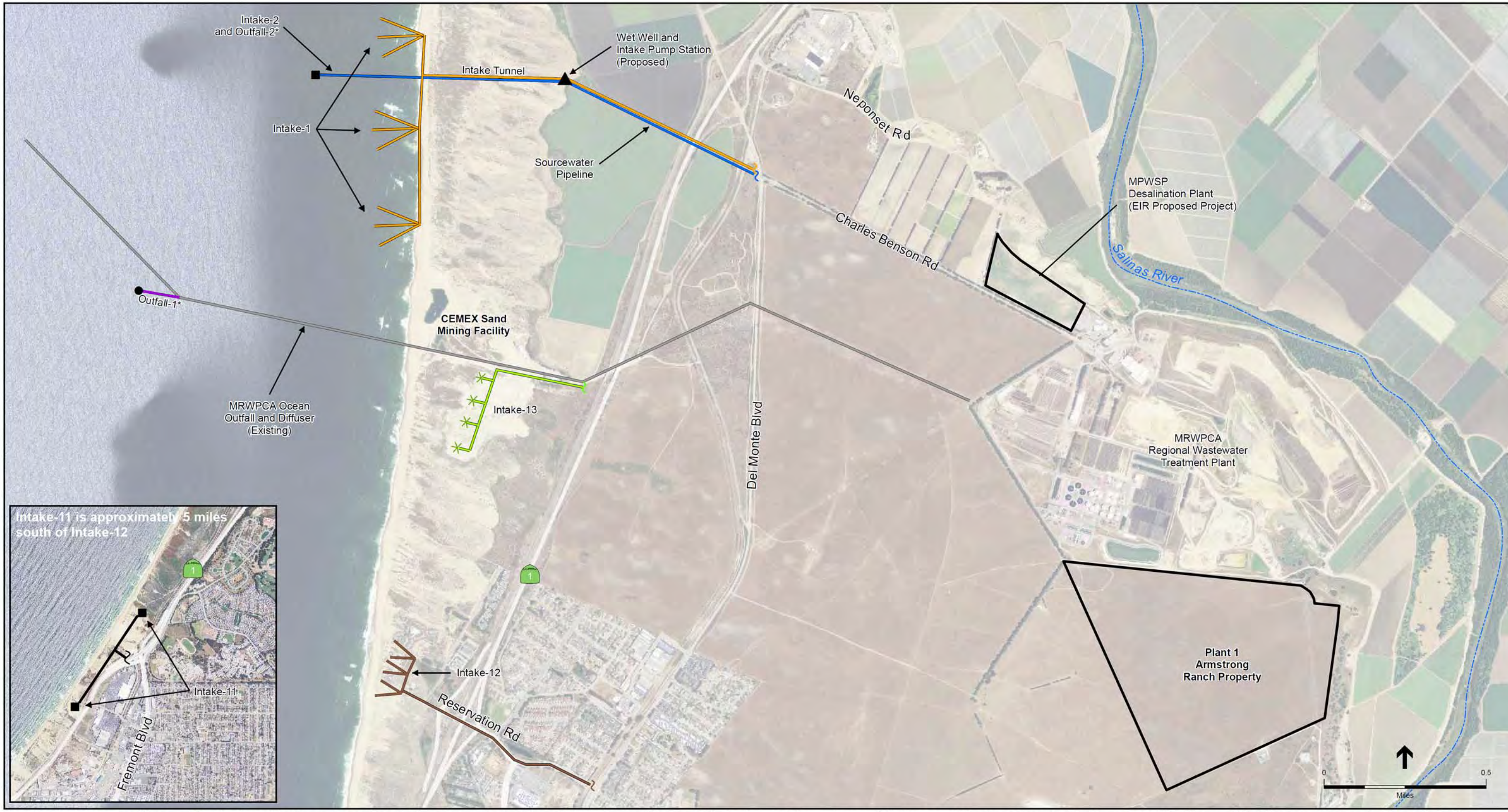
5.3.3 Intake Options Screening Results

There are two general types of desalination intake systems: open-water and subsurface. Open-water intakes collect seawater directly from the ocean using a screened inlet structure. An intake pipeline then conveys the water from the offshore inlet structure to an inland location. Subsurface intakes – like the one described for the proposed project – would draw water from beneath the ocean floor. These two intake technologies have different site requirements, design features, and construction techniques, and are described in **Appendix I1**.

Thirteen intake options were identified and screened for fatal flaws and are shown on **Figures 5.3-1** and **5.3-2**. Six of the thirteen were not carried forward for further analysis, and they are described in **Appendix I2**, along with an explanation for their elimination. Options that were retained are described in this section, and they are evaluated against the proposed project's slant wells at the CEMEX active mining area in Section 5.3.6. **Table 5.3-1** presents the intake options, and summarizes the results of the screening process.

5.3.3.1 Intake Option 1 – Subsurface Slant Wells at North CEMEX

This intake option, which includes 10 slant wells penetrating the submerged lands of MBNMS in an area north of the CEMEX active mining area, was not carried forward into the alternatives evaluation. Construction activities would temporarily disturb approximately 10 acres of critical habitat for sensitive biological resources (California western snowy plover and Smith's blue butterfly, coast buckwheat, Yadon's wallflower, Monterey spineflower, and sand gilia) 2 in the

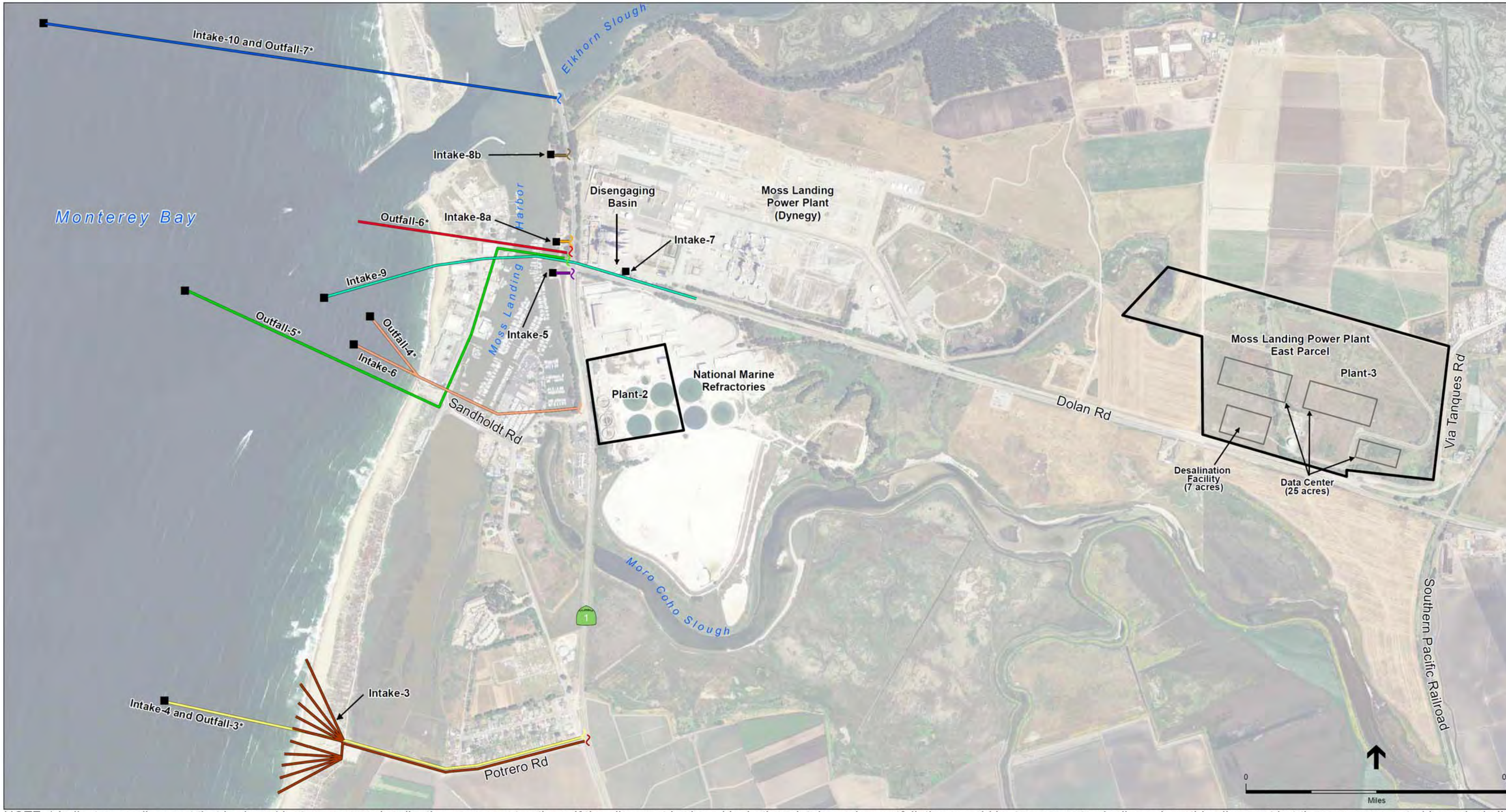


NOTE: * Indicates an alignment that is shared by two or more desalination component options. If the alignment is shared by both an intake and an outfall, there could be two separate pipelines along this alignment but they are represented by a single line. Similarly, if the same existing pipeline could either be converted into an intake or an outfall, the same line represents both options.

SOURCE: ESA, 2013

205335.01 Monterey Peninsula Water Supply Project

Figure 5.3-1
Alternative Component Options - Marina and Seaside



NOTE: * Indicates an alignment that is shared by two or more desalination component options. If the alignment is shared by both an intake and an outfall, there could be two separate pipelines along this alignment but they are represented by a single line. Similarly, if the same existing pipeline could either be converted into an intake or an outfall, the same line represents both options.

SOURCE: ESA, 2014

205335.01 Monterey Peninsula Water Supply Project

Figure 5.3-2

Alternative Component Options - Moss Landing

TABLE 5.3-1
INTAKE OPTIONS SCREENING RESULTS

Figure ID	Name	Feedwater Source	Description	Screening Results
Intake-1	Subsurface Slant Wells at North CEMEX[a] (new construction)	Predominantly seawater, with some portion coming from the Salinas Valley Groundwater Basin[b]	• This option would be located approximately 0.8 mile north of the CEMEX active mining area. • Up to ten slant wells would be buried in the beach "swash" zone. • Gravity-fed intake system would drain to a new pump station located on the inland side of the dunes.	*Not carried forward based on input from resource agencies regarding impacts on sensitive biological resources*[c]
Intake-2	Open-Water Intake at North CEMEX (new construction)	Open ocean	• This option would be located about 0.8 mile north of the CEMEX dredging pond. • A 5,000-foot-long, 36-inch-diameter intake pipeline would extend 2,400 feet offshore. • The intake pipeline would be installed using trenchless construction technology beneath the dunes, beach, and ocean floor. • A passive wedge-wire intake screen would be mounted on a 3-foot vertical riser at the western end of the intake pipeline, approximately 40 feet below the water surface. • Gravity-fed intake system would drain to a new pump station located on the inland side of the dunes.	*Retained for further analysis*
Intake-3	Subsurface Slant Wells at Potrero Road (new construction)	Predominantly seawater, with some portion coming from the Salinas Valley Groundwater Basin[b]	• This option would be located at the west end of Potrero Road. • A total of 10 subsurface slant wells would be constructed in the beach parking lot at the end of Potrero Road. • Wellheads would be buried in the parking lot. • Each well would be equipped with an electric submersible pump. • An enclosed electrical control building would be located at the edge of the parking lot.	*Retained for further analysis*
Intake-4	Open-Water Intake at Potrero Road (new construction)	Open ocean	• This option is located at the west end of Potrero Road. • A 3,100-foot-long, 36-inch-diameter intake pipeline would extend 2,400 feet offshore. • The intake pipeline would be installed using trenchless construction technology beneath the beach and ocean floor. • A passive wedge-wire intake screen would be mounted on a 3-foot vertical riser at the western end of the intake pipeline approximately 40 feet below the water surface. • A new pump station would be located at the eastern end of the intake pipeline in the beach parking lot.	*Retained for further analysis.*

NOTES:

a Presented in CalAm's January 2013 Supplemental Testimony as the proposed project
b Subsurface intakes will extract mostly seawater for feedwater, but a portion of the feedwater may originate from inland sources.
c March 26, 2013 meeting called by Congressman Sam Farr at California State Park's office in Monterey, CA. Attendees included the CPUC, CalAm, National Marine Fisheries Service, Monterey Bay National Marine Sanctuary, United States Fish and Wildlife Service, and U.S. Army Corps of Engineers.
d Based on the results of six exploratory boreholes in the Moss Landing area (Geoscience, 2014).

**TABLE 5.3-1 (Continued)
INTAKE OPTION SCREENING RESULTS**

Figure ID	Name	Feedwater Source	Description	Screening Results
Intake-5	Ranney Wells at Moss Landing Harbor (modify an existing intake system)	Moss Landing Harbor	• This option is located in Moss Landing Harbor, immediately west of the National Refractories site. • This option would convert the existing intake system into a Ranney well intake system located in Moss Landing Harbor. • The existing intake for the National Refractories site consists of a screened open-water intake (currently sitting in the mud), an intake pump station in Moss Landing Harbor, and two 36-inch-diameter source water conveyance pipelines extending from the harbor to the former National Refractories site.	*Not carried forward because of the unsuitable hydrogeologic conditions.*[d]
Intake-6	Open-Water Intake near Moss Landing Harbor (modify & extend existing intake)	Open ocean	• This option is located in Monterey Bay near Moss Landing Harbor. (Peoples' Moss Landing Desalination Project proposed intake) • Open ocean/bay intake system that would rehabilitate the existing caisson intake structure to include a new 40-inch intake pipe that would extend out from the existing caisson approximately 1,400 feet in the open ocean/bay. Two wedge wire passive screens (one active and one standby) would be attached at the end of this new pipeline extension and would be located approximately 120 feet below mean sea level. Each passive screen structure would be 96 inches in diameter and would be used to draw seawater into the existing caisson. The screens would be designed for a maximum through-screen velocity of 0.5 feet per second and with 1.0 mm wedge wire slots to minimize impingement and entrainment.	*Retained for further analysis.*
Intake-7	Disengaging Basin at Moss Landing Power Plant (new diversion from spent cooling system)	Spent once-through cooling water	• This option is located at the Moss Landing Power Plant. • This option would divert seawater from the power plant's cooling system for use as source water for the MPWSP Desalination Plant. • Currently, the seawater used for this option is drawn through the power plant's existing northern intake in Moss Landing Harbor, routed through power-generating Units 1 and 2 for cooling and discharged to a disengaging basin from which it is conveyed to the power plant's outfall and discharged into Monterey Bay. • Under this option, the spent cooling water would be diverted at the disengaging basin and conveyed to the MPWSP Desalination Plant.	*Not carried forward because of the potential future changes in the power plant's operation to meet settlement agreement with SWRCB resulting in additional construction in the future, substantial reduction in intake water volume, and disruption of the intake.*
Intake-8a and 8b	Open-Water Intakes at Moss Landing Power Plant (new connections to two existing intakes)	Moss Landing Harbor	• This option is located in Moss Landing Harbor. • MLPP has two existing cooling system intakes in Moss Landing Harbor just west of the power plant site. The northern intake serves Units 1 and 2; the southern intake serves Units 6 and 7. The existing intakes use pumps to draw water and bar racks and traveling screens to reduce entrainment. • Under this option, a new pump station would be installed behind or near the southern intake screen to divert an additional 24 mgd of feedwater to the MPWSP Desalination Plant. • While the southern intake would be the primary connection point, a pipeline connection to the northern intake would allow CalAm to receive flow from either intake.	*Retained for further analysis.*

TABLE 5.3-1 (Continued)
INTAKE OPTION SCREENING RESULTS

Figure ID	Name	Feedwater Source	Description	Screening Results
Intake-8a and 8b (cont.)			• The pump station would deliver seawater through a new, 36-inch diameter underground pipeline under Highway 1 to Dolan Road, where it would meet a new source water pipeline to the MPWSP Desalination Plant. • Apart from use of the intake screen, the diversion of feedwater from the harbor for the desalination plant would be independent of the power plant's cooling system operations.	
Intake-9	Open-Water Intake at Moss Landing (new construction)	Screened deep-water ocean intake system	• One subsurface intake pipeline would be installed below the seafloor using HDD from the pipeline's eastern end, on Dolan Road near the Moss Landing Power Plant, to the western end, where it "daylights" on the upper slope of the Monterey submarine canyon. • Passive, low velocity, wedge-wire screens on 6-foot risers would be attached to the western end of the intake pipeline close to where it emerges from the subsurface and anchored to the seafloor. • The screened intake would be located about 1,300 feet offshore, on the seafloor, 156 feet below the water surface, and below the euphotic zone (the upper zone of the water column where photosynthesis can occur). • From the screened intakes, raw seawater would be pumped to an onshore pump station. • The pump station would be located at the end of the railspur (near the corner of Dolan Road and SR 1). • DeepWater Desal proposed intake location.	*Retained for further analysis.*
Intake-10	Open-Water Intake in former fuel oil gas pipeline at Moss Landing (modify existing pipeline)	Open ocean	• This option would retrofit a pipeline formerly used to offload fuel oil for the Moss Landing Power Plant from an offshore terminal. The pipeline consists of a 24-inch diameter segment under Moss Landing Harbor to Moss Landing Beach and an 18-inch diameter section that extends from the beach approximately 3,000 feet into Monterey Bay.	*Not carried forward because the size of the pipeline would be too small to provide the quantity of source water needed.*
Intake-11	Ranney Wells in Seaside/Sand City (new construction)	Upper dune sands aquifers (Salinas and Seaside Groundwater Basins	• This option proposes 3 Ranney wells at two sites in the former Fort Ord coastal area in Seaside/Sand City: − Fort Ord Bunker Site – 2 Ranney wells − Fort Ord MW-1 site (west of the Highway 1/California Avenue intersection) – 1 Ranney well	*Not carried forward because its location offers no advantages to the CEMEX location, it would not avoid or eliminate any potential impacts of the proposed project and would add substantial length of pipeline to feed any plant location being considered.*
Intake-12	Subsurface Slant Wells at Reservation Road (new construction)	Predominantly seawater, with some portion coming from the Salinas Valley Groundwater Basin[a]	• This option is located at the west end of Reservation Road near the Marina Coast Water District desalination facility. • 9 slant wells would be constructed in the parking lot. • Wellheads would be buried in the parking lots. • Each well would be equipped with an electric submersible pump.	*Not carried forward because this location would be in direct conflict with MCWD's existing (non-operating) desalination plant or any plans MCWD may have in the future for building a desalination project in its service area.*

TABLE 5.3-1 (Continued)
INTAKE OPTION SCREENING RESULTS

Figure ID	Name	Feedwater Source	Description	Screening Results
Intake-13	Ranney Wells at CEMEX Active Mining Area (new construction)	Predominantly seawater, with some portion coming from the Salinas Valley Groundwater Basin[a]	• This design option would be located in the CEMEX active mining area (same location as the subsurface slant wells described under the proposed project). • 4 Ranney wells (approximately 5.75 mgd each) would be constructed on the south side of the CEMEX settling ponds and access road • Each Ranney well would consist of a 12-foot-diameter buried caisson extending to a depth of 50 feet below the ground surface, with five 500-foot-long screened laterals extending radially from the caisson. • A 1,475-foot-long collector pipeline would convey seawater from the Ranney wells to the Source Water Pipeline. • The construction disturbance area would be the same as the proposed project.	*Retained for further analysis. This design option could be used at any location where slant wells are being considered.*

active beach area and 0.25 acre of prime farmland on the inland side of the dunes. In addition, the footprint of the intake pump station would permanently disturb approximately 3,000 square feet of prime farmland. As described in **Appendix I2**, Intake Option 1 was determined to be fatally flawed due to permitting issues regarding impacts on biological resources.

5.3.3.2 Intake Option 2 – New Open-Water Intake at North CEMEX Site

This option would locate a new open-water intake on the seafloor within MBNMS at the northern end of the CEMEX mining facility, about 0.8 mile north of the CEMEX active mining area. A 5,000-foot-long, 36-inch-diameter intake pipeline would extend from the inland side of the dunes to approximately 2,400 feet offshore. The intake pipeline would be installed using trenchless construction techniques under the beach and dune areas and would daylight on the ocean floor at a depth of approximately 40 feet below the water surface. A passive wedge-wire intake screen would be mounted on a vertical shaft connected to the western terminus of the intake pipeline. This open-water intake would be gravity-driven and would deliver seawater to a 3,000 square-foot intake pump station and wet well located on the inland side of the dunes. The intake pump station would pump the seawater to the Desalination Plant. As with other open-water intake options, this option would require a membrane or media pretreatment filtration system to remove algae and suspended and colloidal solids as well as pathogens from the source water prior to conveying it through the reverse-osmosis system.

The site is within unincorporated Monterey County. Construction of this intake option would temporarily disturb approximately 0.25 acre of prime farmland on the inland side of the dunes and 2,000 square feet on the ocean floor. The intake pump station would be housed in a 3,000 square-foot building on the inland side of the dunes and would permanently disturb approximately 3,000 square feet of prime farmland; the intake pipeline would have a permanent footprint of about 200 square feet on the ocean floor. However, because the intake pipeline would be installed via tunneling technologies from the inland side of the dunes, construction of Intake Option 2 would not disturb sensitive habitat in the active beach area. **Appendix I1** provides additional information regarding general construction methods and maintenance of open-water intakes. No entrainment/impingement studies or pilot testing have been completed to determine the volume of organic marine material that would be affected by the intake, but an analysis by the CCC suggests that the effects of an open-water intake for the MPWSP, expressed as area of production foregone (APF, see Section 5.5.5, Marine Biological Resources for further explanation), would be something less than 20 acres (Luster, 2016).

5.3.3.3 Intake Option 3 – Subsurface Slant Wells at Potrero Road

This option would involve the installation of a total of 10 subsurface slant wells penetrating the submerged lands of MBNMS in the beach parking lot at the west end of Potrero Road in northern Monterey County, near the southern border of the unincorporated community of Moss Landing.

The slant wells would be drilled from the parking lot, and the wellheads would be buried in the parking area, below the hardened sand surface of the lot. The slant wells would be designed as pumping wells -- that is, each well would be equipped with an electric submersible pump. The slant wells would be grouped into two clusters, with five wells in each cluster. A short, 36-inch-diameter collector pipeline would convey the seawater from the slant well clusters to a Source Water Pipeline that would be built within Potrero Road. The Source Water Pipeline would be located within existing rights-of-way, and would convey seawater to the desalination plant. All other aspects of construction and maintenance of the slant wells under Intake Option 3 would generally be consistent with those of the slant wells under the proposed project (see Chapter 3, Description of the Proposed Project).

The electrical controls for the slant wells would be located at the edge of the parking lot. The electrical control building, the only above-ground structure following construction, would be approximately 4 feet wide, 12 feet long, and 6 feet high. Overhead electrical lines would extend from the electrical control building to Potrero Road and east along the north side of Potrero Road to connect with the existing Pacific Gas and Electric (PG&E) power line on Potrero Road. The California Department of Parks and Recreation (California State Parks) owns and operates the beach parking lot at Potrero Road. Implementation of subsurface slant wells at this location would require easements from California State Parks. Slant well construction would require temporary closure of the beach parking lot.

The Potrero Road beach parking lot lies within the coastal zone; the *North County Land Use Plan* of the *Monterey County General Plan* designates this land for public/quasi-public and scenic and natural resources and recreational uses (Monterey County, 1982).

5.3.3.4 Intake Option 4 – Open-Water Intake at Potrero Road

This option would locate a new open-water intake pipeline at the beach parking lot at the west end of Potrero Road. A 0.6-mile-long (3,100-feet), 36-inch-diameter open-water intake pipeline would extend from the beach parking lot to approximately 2,400 feet offshore into MBNMS. The intake pipeline would be installed using trenchless construction technology under the beach and ocean floor, and would emerge on the ocean floor at a depth of about 40 feet below the water surface. A passive wedge-wire screen would be mounted on the seafloor on a vertical shaft connected to the western end of the intake pipeline. The intake pipeline would convey raw seawater to a new intake pump station. This above-ground pump station would be housed in a 3,000 square foot building located in the northeast corner of the beach parking lot. As with other open-water intake options, this option would require a membrane or media pretreatment filtration system to remove algae, suspended and colloidal solids, and pathogens from the source water before conveying it through the reverse-osmosis system.

Construction of this intake option would temporarily disturb approximately 2,000 square feet of the seafloor in MBNMS, and the footprint of the screened riser would permanently disturb about 200 square feet of ocean floor. It is assumed that land-based construction activities for an open-water intake at the Potrero Road site would occur entirely in the beach parking lot. General construction methods and considerations for open-water intakes, as well as operation and maintenance assumptions, are described in **Appendix I1**. Refer to the description of this site under Intake Option 3, above, for information regarding existing land uses and the General Plan land use designations at this site.

5.3.3.5 Intake Option 5 – Ranney Wells at Moss Landing Harbor (Modify Existing Intake System at National Refractories site)

This intake option was originally proposed for the People's Moss Landing Water Desal Project by the Moss Landing Business Park, LLC and would involve the conversion of an existing open-water intake system of the former National Refractories and Minerals Corporation (National Refractories) in Moss Landing Harbor into a Ranney well subsurface intake system, and was not carried forward into the alternatives evaluation. As described in **Appendix I2**, Intake Option 5 was determined to be fatally flawed because borehole data indicated that individual sand and sand and gravel lenses in the Moss Landing area are not vertically or laterally extensive and that the permeable deposits were not thick enough for a subsurface intake system in this area to be capable of providing a reliable source of seawater for the MPWSP Desalination Plant.

5.3.3.6 Intake Option 6 – Open-Water Intake at Moss Landing

This option would consist of an open-water intake system that would draw seawater from Monterey Bay, as proposed by the People's Project. The intake would use an existing 20-foot diameter intake pump caisson structure that is located on the beach, next to the Monterey Bay Aquarium Research Institute on Sandholdt Road in Moss Landing. The existing open-water intake structure would include a new 40-inch diameter intake pipe that would extend out from the existing caisson approximately 1,400 feet into the open bay and ocean. Two wedge wire passive screens, one active and one stand by, would be attached at the end of this new pipeline extension and would be located approximately 120 feet below mean sea level. Each passive screen structure would be 96-inches in diameter and would be used to draw seawater into the existing caisson. The screens would be designed for a maximum through-screen velocity of 0.5 feet per second, and would contain 1.0 mm wedge wire slots to minimize impingement and entrainment.

A new 10-foot high pump and pump house structure would be built on top of the existing caisson with a first-floor elevation height of approximately 17 feet above mean sea level so that the pumps would be outside of the tsunami zone of inundation. Vertical turbine pumps would be used, with the pumps submerged in the intake structure and the motors in the pump house above. From the pump house, a new 40-inch diameter pipeline would convey the seawater beneath the Moss Landing Harbor and State Route 1 to the desalination plant following existing rights-of-way.

5.3.3.7 Intake Option 7 – Disengaging Basin at Moss Landing Power Plant (Water from Spent Cooling System)

This intake option would divert spent cooling water from the disengaging basin at the Moss Landing Power Plant (MLPP) for use as source water at the MPWSP Desalination Plant and was not carried forward into the alternatives evaluation. As described in **Appendix I2**, Intake Option 7 was eliminated from further consideration due to uncertainties regarding the reliability, quality, and quantity of the potential source water supply.

5.3.3.8 Intake Option 8 – Open-Water Intake at Moss Landing Harbor (Either of Two Existing Intakes for Moss Landing Power Plant Cooling System)

This option would use the power plant's existing cooling system intake screens to screen source water for the MPWSP Desalination Plant, and would be independent of the power plant's cooling system operations (RBF Consulting, 2013).

The power plant has two cooling water intakes, both located along the eastern edge of Moss Landing Harbor. The northern intake ("Intake 8b") is used to draw cooling water for power generating Units 1 and 2, and the southern intake ("Intake 8a") is used to draw cooling water for power generating Units 6 and 7. The intakes use vertical traveling screens fitted with woven wire mesh panels mounted on a continuous belt; the northern intake has a total of six traveling screens (three for each power generating unit) and the southern intake has a total of eight traveling screens (four for each generating unit). The screens include a drive mechanism and spray cleaning system. As the screens rotate vertically through the water, debris on the screens is lifted out of the water to the top of the screen belt, where it is sprayed off the screen by the screen wash system. The screens at the northern intake are normally rotated every four hours, or they may activate automatically based on the pressure differential on the upstream and downstream faces of the screen. They can also run continuously. Because power generating Units 6 and 7 operate less frequently, the traveling screens at the southern intake are currently rotated and cleaned on an as-needed basis (Tenera, 2007). The northern intake structure was modified in conjunction with the approval of new Units 1 and 2 in 2000;[10] the traveling screens at the northern intake are inclined about 35 degrees from vertical and have 5/16-inch woven wire mesh panels. The traveling screens at the southern intake structure are vertical in the water column and have traveling screens with 3/8-inch wire mesh panels. Both intakes also include initial bar racks; the traveling screens are located 20 and 25 feet behind the bar racks at the northern and southern intakes, respectively. The bar racks at the northern intake have 3 1/2-inch openings between the bars and the bar racks at the southern intake have 3 5/8-inch openings (Tenera, 2007; Dynegy, 2011). Nine pumps operate the northern intake. The six pumps that draw cooling water for Units 1 and 2 are located about 300 feet behind the intake; the remaining three pumps are used for the screen wash system. Seven pumps operate the southern intake. The four pumps that draw water for Units 6 and 7 are located about 30 feet behind the intake. Like the northern intake, another three pumps are used for the screen wash system (Tenera, 2007).

Under this option, new diversion pumps and a pipeline to connect to a new source water pipeline would be installed behind the power plant's existing intake screens to pump seawater to the desalination plant. While the southern intake would be the primary connection point, a secondary pipeline connection to the power plant's northern intake would enable CalAm to draw water from either intake. A new source water pump station would be installed near the southern intake to deliver the seawater via a new connecting pipeline to a new 36-inch-diameter source water pipeline. Trenchless construction would be used to install the pipeline under Highway 1. As with other open-water intake options, this option would require a membrane or media pretreatment

[10] The new Units 1 and 2 replaced the plant's original Units 1 through 5 which were retired in 1995.

filtration system to remove algae, suspended and colloidal solids, and pathogens from the source water before conveying it through the reverse-osmosis system.

This intake option would modify an existing MLPP facility (in this case, the existing intakes in Moss Landing Harbor). Physical space is available at the existing intakes for these modifications; access to the intakes would be via Highway 1.

5.3.3.9 Intake Option 9 – Screened Deep-water Ocean Intake at Moss Landing

This intake option has been proposed by DeepWater Desal, LLC, as part of the Monterey Bay Regional Water Project. This analysis assumes a version that has been scaled down to meet the needs of the 9.6 mgd project proposed by CalAm. The intake option would consist of an intake structure in the Monterey Submarine Canyon that would draw in raw seawater, intake piping that would deliver the seawater to the shore, and an onshore pump station that would pump the seawater to the desalination facility. The offshore intake structure location is very close to the intake location described in Option 6. The difference between these two options is the method of installing pipelines to connect onshore facilities to the offshore intake structure.

The intake structure would be located on the seafloor, within a ravine near the head of the Monterey Submarine Canyon, southwest of the Moss Landing Harbor entrance. It would be installed at the end of the subsurface intake pipeline at the point where it emerges from below the seafloor, approximately 1,300 feet offshore from the mean high water line at a depth of approximately 156 feet below mean low water.

Seawater would be conveyed from the intake structure to an onshore pump station via a 36-inch-diameter subsurface intake pipeline. The pipeline would be constructed subsurface using horizontal directional drilling (HDD) from the pump station site located near the end of the railspur at the corner of Dolan Road and SR-1. The pipeline would extend approximately 3,600 feet to the offshore seawater intake structure location. The HDD pit would be within the pump station footprint.

As with other open-water intake options, this option would require a membrane or media pretreatment filtration system to remove algae, suspended and colloidal solids, and pathogens from the source water before conveying it through the reverse-osmosis system.

5.3.3.10 Intake Option 10 – Open Deepwater Intake in PG&E Fuel Oil Pipeline at Moss Landing

This intake option would use the existing carbon-steel pipeline previously used by PG&E for offloading fuel oil for the Moss Landing Power Plant and was not carried forward into the alternatives evaluation. As described in **Appendix I2**, Intake Option 10 is fatally flawed because the existing fuel line likely contains a substantial amount of fuel residue which could present a public health issue, and the 18-inch-diameter of the offshore section of the pipeline would be too small to support a 9.6 mgd facility.

5.3.3.11 Intake Option 11 – Ranney Wells in Seaside/Sand City

This intake option emerged from earlier investigations conducted by the MPWMD and would involve the installation of three Ranney wells at two sites in the former Fort Ord coastal area in Seaside and Sand City and was not carried forward into the alternatives evaluation. As described in **Appendix I2**, Intake Option 11 would involve the installation of three Ranney wells at two sites in the former Fort Ord coastal area in Seaside and Sand City. However, the former Fort Ord Wastewater Treatment Plant site and former Stillwell Hall sites faced political challenges, and the Bunker site faced siting constraints and relatively low-permeability sands that would limit the potential amount of feedwater that could be developed from a subsurface intake.

5.3.3.12 Intake Option 12 – Subsurface Slant Wells at Reservation Road

This intake option would locate at least nine subsurface slant wells at the western terminus of Reservation Road on the inland side of the Marina State Beach parking lot and was not carried forward into the alternatives evaluation. As described in **Appendix I2**, a potential constraint to Intake Option 12 is Marina Coast Water District's existing 300 afy desalination plant and associated intake well, as well as their plans for developing a future desalination facility that could include development of a subsurface seawater intake system, which would result in well interference. Additionally, the location of Intake Option 12 is not favorable for slant well installation due to the shallow depth of the aquifers.

5.3.3.13 Intake Option 13 – Ranney Wells at CEMEX Active Mining Area

Intake Option 13 would substitute the proposed subsurface slant wells at the CEMEX active mining area with four Ranney wells, each spaced approximately 350 feet apart (CalAm, 2014). A Ranney well is comprised of a vertical caisson (a large diameter shaft where the water is collected from each well and then pumped) extending below the water table, from which horizontally placed perforated screens (laterals) are extended. Like the slant wells under the proposed project, the Ranney wells would be set back approximately 900 feet inland from the shoreline. Each caisson would be 12 feet in diameter, and would be buried approximately 50 feet into the sand, with the top of the caisson flush with the beach surface. Each of the four Ranney wells would be equipped with five screened laterals that would draw groundwater from the shallow Dune Sands Aquifer. A pipeline that is about 1,475 feet long and 42-inches in diameter would collect seawater from the Ranney wells and convey it to the Source Water Pipeline located beneath the CEMEX access road. The electrical controls for the Ranney wells would be housed in an aboveground electrical control panel located just south of the CEMEX settling ponds and existing access road, and an electrical control building would be located at the eastern entrance of the CEMEX property. The footprint required for the Ranney wells, the source water pipeline, electrical control panel, and electrical control building would be identical to the proposed project (CalAm, 2014). See **Appendix I1** for a general discussion of construction and maintenance assumptions associated with Ranney Wells.

5.3.3.14 Intake Screening Summary

Seven intake options were determined to be feasible and were carried forward for evaluation. The next step compares the impacts of each intake option against the proposed slant wells at CEMEX to determine if adverse impacts would be reduced. This step is described in Section 5.3.6.

5.3.4 Outfall Options Screening Results

For a 9.6 mgd desalination plant, a brine stream ranging between approximately 12 and 14 mgd would be discharged via an ocean outfall in accordance with Ocean Plan requirements. See Section 3.4.1 in Chapter 3, Description of the Proposed Project, for a description of brine discharges under the proposed project.

This analysis considers several potential outfall options for brine discharge, all retained for evaluation in the second step of the process. They are summarized in **Table 5.3-2**, shown in **Figures 5.3-1** and **5.3-2** and described in sections 5.3.4.1 through 5.3.4.7. All outfall options, except for Outfall Option 1, would discharge into the waters of MBNMS.

5.3.4.1 Outfall Option 1 – Modified MRWPCA Outfall and New Diffuser

This option would involve inserting a smaller-diameter pipeline inside the existing Monterey Regional Water Pollution Control Agency's (MRWPCA) outfall pipeline, installing a new diffuser to the end of the smaller pipe, which would exit the existing outfall pipe where the existing outfall turns to the northwest, and building a new pump station at the MRWPCA Regional Wastewater Treatment Plant site. This outfall option was originally intended to address what were thought to be potential water quality and outfall capacity impacts associated with using the existing outfall for brine discharge. However, it is possible to meet the Ocean Plan limits for the proposed project with mitigation, as presented in Section 4.3.5 (Surface Water Hydrology and Water Quality). At the MRWPCA outfall headworks under Outfall Option 1, approximately 2.6 miles of 20-inch diameter pipe would be pushed inside the existing MRWPCA outfall pipe. The 20-inch diameter pipe would extend to the first offshore bend in the outfall pipe. A new connection would be built as an exit structure at the bend of the existing pipe, and a barge would be used to transport, sink, attach, and secure a new 500-foot-long diffuser to the existing pipe and to the ocean floor for discharging and dispersing the brine (see **Figure 5-1**). It is estimated that construction activities associated with this outfall option would result in approximately 0.5 acre of disturbance on the ocean floor.

The modified outfall would be configured with a new pump station to be built on or near the MRWPCA property, in the vicinity of the existing MRWPCA outfall headworks. During wet-weather periods, when effluent flows are high, the brine stream would be pumped through the inserted pipe and the new diffuser, and MRWPCA's wastewater effluent would be pumped through the annular space between the outer wall of the inserted pipeline and the inner wall of the outfall and the existing diffuser. Pumping would provide MRWPCA the same effective capacity as the existing outfall.

TABLE 5.3-2
OUTFALL OPTIONS SCREENING RESULTS

ID	Name	Description	Screening Results
Outfall-1	Modified MRWPCA Outfall and New Diffuser (modifications to existing outfall facility)	• This option would use the existing MRWPCA outfall pipeline in MBNMS, which ends at a 1,100-foot-long diffuser. This gravity-driven facility discharges treated wastewater from the MRWPCA Regional Wastewater Treatment Plant. • A 2.6-mile-long, 20-inch-diameter brine discharge pipeline would be suspended inside the existing MRWPCA outfall pipeline. • A new 500-foot-long brine diffuser would connect to the existing outfall pipeline. • A new pump station would be built near the headworks of the existing MRWPCA outfall, on the MRWPCA parcel. • The annular space between the outer wall of the inserted pipeline and the inner wall of the outfall would continue to be gravity-driven and would be used for wastewater effluent flow during all flow conditions. • The new brine discharge pipeline and diffuser would be used for pressurized brine discharges during wet-weather flows only; under all other flow conditions, the existing outfall and diffuser would be used.	*Retained for Further Analysis*
Outfall-2	New Outfall at North CEMEX Site (new construction)	• A 24-inch diameter outfall pipeline would be built approximately 0.8 mile north of the CEMEX active mining area in MBNMS. • An outfall pipeline would extend approximately 2,500 feet offshore and end at a new diffuser designed to meet Ocean Plan requirements. • An outfall pipeline would tunnel under the dunes, beach, and ocean floor. • A pump station would be built at the desalination plant site to pump brine through the new outfall and diffusers.	*Retained for Further Analysis*
Outfall-3	New Outfall at Potrero Road (new construction)	• A 24-inch-diameter outfall pipeline would be built east to west along Potrero Road into MBNMS. • From the western end of Potrero Road, the outfall pipeline would extend approximately 3,000 feet offshore and end at a new diffuser designed to meet Ocean Plan requirements. • The outfall pipeline would be constructed under the beach and ocean floor using tunneling technologies.	*Retained for Further Analysis*
Outfall-4	Modified National Refractories Outfall (modifications to existing outfall facility)	• The existing 2,750-foot-long, 51-inch-diameter outfall extends underground from the western boundary of the former National Refractories site in Moss Landing, under the marina, the commercial harbor, and the harbor "island," and daylights near its end, approximately 620 feet offshore in the Monterey Bay in MBNMS at a depth of approximately 43 feet beneath the water surface. (Same outfall as proposed by the Peoples' Project) • The existing outfall would be repaired to address joint decoupling and minor cracks, and new diffusers would be attached. The pipe is buried with approximately 25 feet of cover over the entire length • Operation of this outfall would require repair of the outfall pipeline and diffuser, and would require modifications to meet the State Ocean Plan requirements. Due to the age and condition of the existing 51-inch pipeline, a new 36-inch-diameter pipeline would be slip-lined within the existing 51-inch outfall facility and then extended approximately 700 feet further to a depth of approximately 120 feet in the Monterey Bay on the edge of the submarine canyon. The 700-foot-long pipeline extension would be laid and anchored on the ocean floor and covered in riprap. This segment of pipeline would contain a diffuser system with 32 nozzles.	*Retained for Further Analysis*

TABLE 5.3-2 (Continued)
OUTFALL OPTIONS SCREENING RESULTS

ID	Name	Description	Screening Results
Outfall-5	New Outfall at Sandholdt Road (new construction)	• A new 24-inch-diameter outfall pipeline would be aligned east to west from Sandholdt Road. The outfall pipeline would extend approximately 1,000 feet offshore into MBNMS and end at a new diffuser designed to meet Ocean Plan requirements.	*Retained for Further Analysis*
Outfall-6	Existing Outfall for Moss Landing Power Plant Spent Cooling System (new connections to existing facilities)	• The Moss Landing Power Plant has two existing 144-inch-diameter outfall pipelines that end approximately 1,000 feet offshore from the Moss Landing Harbor inlet approximately 20 feet above the ocean floor and 20 feet below the water surface. This outfall is used during power plant cooling system operations. • Under this option, brine concentrate would be conveyed to the disengaging basin at the power plant via a new pipeline connection. Brine would discharge to Monterey Bay via the two existing outfall pipelines.	*Retained for Further Analysis*
Outfall-7	New Outfall at Moss Landing	• Brine would discharge from the desalination facility to the offshore discharge diffuser structure via one proposed subsurface 24-inch-diameter discharge pipeline. The discharge diffuser structure would be located in Monterey Bay approximately 3,400 feet offshore in MBNMS. (Same outfall location as proposed by Deepwater Desal Project) • Operation of the outfall would include a multi-jet linear diffuser that would be located on the seafloor, and that would consist of three separate standing pipe risers emerging from a single 24-inch pipe manifold. Each riser would be fitted with a duckbill diffuser nozzle. The diffuser structure would be buried in riprap protective cover and ballast stone that would be placed up to the level of the diffuser, extend out a few feet in either direction, then descend down to the seafloor at a 4:1 horizontal to vertical slope. Only the duckbill diffuser nozzles would extend above the protective cover.	*Retained for Further Analysis*

It is assumed that the MRWPCA would continue to maintain and operate the modified outfall. Maintenance activities would involve, as they do now: annual integrity test, air tests to identify leaks, video surveillance, and periodic flushing of the outfall line to unclog the diffuser ports. The MRWPCA conducts these maintenance activities at regular intervals. Other maintenance activities could include hand scraping of the diffuser section of the outfall line.

5.3.4.2 Outfall Option 2 – New Outfall at North CEMEX Site

This option would involve building a new ocean outfall pipeline and diffuser at the north CEMEX site (i.e., the same location as Intake Options 1 and 2), and building a brine discharge pump station at the desalination plant site.

As with the other outfall options, the length of the outfall pipeline would vary depending on whether the desalination plant was built at the proposed Charles Benson Road site or at one of the two site options presented in Section 5.3.5. For the purposes of this screening step, only the 5,500-foot-long segment of the outfall pipeline that would extend between the inland side of the dunes to the east and the diffuser in the open ocean at the western end is considered. This segment would be identical regardless of the location of the desalination plant. The outfall pipeline would be 24 inches in diameter. The eastern 2,500-foot-long segment would extend from the inland side of the dunes to the shoreline. The outfall pipe would tunnel under the dunes and beach and would daylight on the ocean floor approximately 2,500 feet offshore (see **Figure 5-1**). A 500-foot-long diffuser, designed to meet the 2012 Ocean Plan requirements, would be built on the ocean floor at the western end of the pipe.

The diffuser would be delivered via barge, lowered, attached to the pipeline, and anchored to the ocean floor. A 50-foot-wide construction corridor would be needed to anchor the diffuser to the ocean floor. Segments of the outfall pipeline located east of the dunes would be installed using open-trench construction methods except that, as with the proposed project pipelines, jack and bore methods would be used for the segment crossing under Highway 1 and any drainages along the alignment. The brine discharge pump station at the desalination plant site would be used to pump the brine stream through the outfall and diffuser and disperse the discharge.

The City of Marina has jurisdiction over much of this land, which is subject to the *City of Marina General Plan* and *Local Coastal Land Use Plan*. This land is designated for Habitat Preserve and Other Open Space land uses and zoned Coastal Conservation and Development (City of Marina, 2000; City of Marina, 1982). The north CEMEX intake pump station site would be located in unincorporated Monterey County and, therefore, would be subject to provisions of the *North County Land Use Plan* of the *Monterey County General Plan*. The site is designated as prime farmland. There appears to be sufficient physical space to accommodate an outfall pipe, pending approval of the appropriate easements. Maintenance activities would involve annual integrity tests, air tests to identify leaks, video surveillance, and periodic flushing of the outfall line to unclog the diffuser ports. Other maintenance activities could include hand scraping of the diffuser section of the outfall line. Implementation of this outfall option would require coordination and access agreements with CEMEX.

5.3.4.3 Outfall Option 3 – New Outfall at Potrero Road

This outfall option is similar to Outfall Option 2, except that it would be located approximately 4.5 miles to the north. This option proposes construction of a new outfall pipeline and diffuser extending offshore from the beach parking lot at the west end of Potrero Road, and building a new brine discharge pump station.

From the beach parking lot, approximately 3,000 linear feet of 24-inch diameter pipe would be installed using trenchless technologies beneath the beach and ocean floor. The outfall pipeline would daylight on the ocean floor, and a 500-foot-long diffuser, designed to meet proposed 2014 Ocean Plan requirements, would be attached to the western end of the pipe (RBF Consulting, 2013) and anchored to the ocean floor. Construction activities on and disturbance of the ocean floor are assumed to be similar to those described above for Outfall Option 2. It is assumed that the portion of the outfall pipeline located east of the Potrero Road beach parking lot would be built using open-trench construction methods except when crossing major roads, such as Highway 1, or when crossing drainages, when jack and bore methods would be used. The brine discharge pump station would be located in the existing parking lot, would pump the brine stream through the outfall and diffuser, and would disperse the discharge.

The description of Intake Option 3 in Section 5.3.3.2, above, provides information regarding land use and zoning at the Potrero Road site. There appears to be sufficient physical space to accommodate the outfall pipe, pending approval of the appropriate easements. Maintenance activities would involve annual integrity tests, air tests to identify leaks, video surveillance, and periodic flushing of the outfall line to unclog the diffuser ports. Other maintenance activities could include hand scraping of the diffuser section of the outfall line. This outfall option would require CalAm to obtain an easement from California State Parks for any portions of the outfall pipeline that traverse parkland at the end of Potrero Road.

5.3.4.4 Outfall Option 4 – Modified National Refractories Outfall

Outfall Option 4 would involve modifications to the existing outfall at the former National Refractories site, now called the Moss Landing Business Park or Moss Landing Commercial Park and is also the proposed outfall for the People's Project (described as Alternative 4, in Section 5.4).

The existing outfall is a 2,750-foot-long, 51-inch-diameter[11] concrete pipe that terminates approximately 800 feet offshore in Monterey Bay, at a depth of 43 feet below the water surface (SPI and Helm, 2013; Mickley, 2012; MLBP LLC, 2013b). From a point near the western boundary of the former National Refractories site, the outfall pipeline is routed beneath the marina, the commercial harbor, and "Moss Landing Island,"[12] to the point at which it emerges from the surface near its terminus in the bay (Landmark Realty, 2011). The pipe is buried with

[11] Mickley (2012) reports the outfall has an inside diameter of 51 inches and an outside diameter of 56 inches. The *Final Report of Evaluation of Seawater Desalination Projects* prepared for the Monterey Peninsula Regional Water Authority (SPI and Helm, 2013) describes the existing outfall pipeline as 51 inches, as does the People's Moss Landing Water Desal Project (PML Desal, 2014) and a RWQCB permit (Order No. R3-2009-0002). Other sources describe the outfall as 52 inches (Miller, 2012) or 54 inches (Landmark Realty, 2011).

[12] Moss Landing Island refers to the area between the harbor and the bay north of Sandholdt Bridge.

approximately 25 feet of cover over the entire length. A structural evaluation identified cracks that could be repaired with epoxy resin and indicated that, after the repair, the concrete pipe would be structurally adequate to function as an outfall. Operation of this outfall would require repair of the outfall pipeline and diffuser, and would require modifications to meet the State Ocean Plan requirements. Due to the age and condition of the existing 51-inch pipeline, a new 36-inch-diameter pipeline would be slip-lined within the existing 51-inch outfall pipeline and then extended approximately 700 feet further to a depth of approximately 120 feet in the Monterey Bay on the edge of the submarine canyon. The discharge would include one new 16-inch diffuser port.

The outfall is not currently used for discharges from the former National Refractories site; however, the outfall pipeline currently has within it two 8-inch polypropylene intake pipelines. These intake lines access open water through ports in the existing outfall diffuser; intake screens are attached to the lines about 100 feet from the end of the diffuser and serve the MLML, Phil’s Fish Market, sea lion facilities, and the Monterey Bay Aquarium Research Institute (MLBP LLC, 2013c, RWQCB, 2009). The People’s Project sponsors have indicated their interest in continuing to accommodate this use of the outfall pipeline along with modifications to use the pipeline as an outfall to serve a new desalination plant (MLBP LLC, 2013c).

The construction activities associated with the necessary repairs to the existing outfall are not known. However, it is assumed the offshore portion of the outfall would be accessed by barge and that a new diffuser would replace the existing one.

5.3.4.5 Outfall Option 5 – New Outfall at Sandholdt Road

This outfall option is similar to Outfall Option 2 (New Outfall at North CEMEX Site) and Option 3 (New Outfall at Potrero Road), but would be located at Moss Landing. This outfall option would involve construction of a new ocean outfall and diffuser extending offshore from a point on Sandholdt Road, and a new brine discharge pump station at the desalination plant site that is ultimately selected.

Although the MPWSP Contingency Plan did not identify a specific site on Sandholdt Road for this option, this analysis assumes that the site for this outfall option is on the west side of Sandholdt Road directly west of Sandholdt Bridge, where the road turns north. The July 2014 Revised Draft Moss Landing Community Plan identified several sites in this area as having “development potential,” and the location appears suitable for accommodating the construction of a subsurface outfall. The Community Plan identifies one of the three development potential sites in this immediate location as “pier” (where the Sandholdt Pier formerly existed), another as “aquaculture slab,” and the third as “MLML” (one of several sites on Sandholdt Road identified as being associated with MLML). Construction of a subsurface desalination outfall from this area would not preclude future construction of a new pier development of an aquaculture facility in the vicinity, or many other potential future land uses. From the site on Sandholdt Road, the outfall pipeline would tunnel beneath the seafloor and emerge from the surface about 1,000 feet offshore; a 500-foot long diffuser would be attached to the outfall pipeline. Construction activities at this site and disturbance on the ocean floor are assumed to be similar to those described above for Outfall Option 2.

The site and areas to the north along Sandholdt Road are designated Industrial-Coastal Dependent – Light in the current Monterey County Land Use Plan: Moss Landing (1982) and Waterfront Industry in the July 2014 Revised Draft Moss Landing Community Plan; the site is zoned LI (CZ) (Light Industrial-Coastal Zone). The Salinas River State Beach borders the site to the south. There appears to be sufficient physical space to accommodate the outfall pipe, subject to obtaining the appropriate easements. Maintenance activities would involve annual integrity tests, air tests to identify leaks, video surveillance, and periodic flushing of the outfall line to unclog the diffuser ports. Other maintenance activities could include hand scraping of the diffuser section of the outfall line. Implementation of this outfall option would require that CalAm coordinate with and obtain appropriate access agreements and easements from landowners, including California State Parks if any portion of the outfall pipeline traverses parkland.

5.3.4.6 Outfall Option 6 – Modify Existing Outfall for Moss Landing Power Plant Cooling Water

This outfall option would involve the construction of a new pipeline connection to the existing disengaging basin at the Moss Landing Power Plant to discharge brine via the power plant's existing cooling water system outfall, and a new brine discharge pump station located at the desalination plant site.

The Moss Landing Power Plant and existing outfall pipelines are owned by Dynegy Moss Landing, LLC. The outfall facility consists of two 144-inch diameter outfall pipelines that end approximately 1,000 feet offshore in Monterey Bay at approximately 20 feet above the seabed and 20 feet beneath the water surface (CPUC, 2009). Spent cooling water from the power plant's power generating Units 1 and 2 discharges to the disengaging basin, from which the water flows to the power plant's outfall pipelines; cooling water from power generating Units 6 and 7 discharges to the outfall pipelines downstream from the disengaging basin. The brine stream from the desalination plant would thus mix with spent cooling water from Units 1 and 2 in the disengaging basin and would mix with the spent cooling water from all four generating units in the outfall pipelines before being discharged to Monterey Bay, assuming current power plant operations.

In response to the requirements of section 316(b) of the federal Clean Water Act, in 2010 the SWRCB adopted a policy regulating coastal power plants that use once-through cooling systems[13] (SWRCB, 2014). Under the SWRCB's once-through cooling policy, starting in 2016, the power plant must reduce its intake of cooling water by 83.7 percent to reduce entrainment and impingement. Alternatively, if the power plant cannot or chooses not to reduce its intake, it must achieve a greater reduction in mortality from entrainment and impingement in some other way, and must fully comply with the reduction by December 31, 2020. Dynegy has indicated its intention to retrofit the power plant's four generating units to reduce entrainment and impingement impacts under the once-through cooling policy. Complying with the policy would dramatically reduce the amount of cooling water discharged through the power plant's outfall, and the cooling water that is discharged is expected to have much higher concentrations of

[13] Once-through cooling systems circulate water through pipes to absorb heat from power plants or data centers for example, and discharge the now warmer water to the ocean.

minerals compared to current discharges from the power plant. This is because, once the generating units are retrofitted, evaporation during the cooling process will concentrate the minerals in the original seawater. Therefore, once the power plant complies with the once-through cooling policy, the plant's cooling water system would provide little, if any, dilution of the desalination plant's brine discharge. Through a 2014 settlement agreement between the SWRCB and Dynegy, these reductions would be met by new technology, screening, and other methods. When the power plant meets its required reductions, CalAm would need to insert a smaller pipeline within one of the existing outfall pipelines and the existing riser, and to attach an appropriate diffuser to achieve the pressure required for brine discharge rates at the outfall diffuser.

Under existing conditions, all construction activities would occur in previously disturbed areas, and no construction would be required in the open waters of the Monterey Bay or Moss Landing Harbor. When the power plant complies with the once-through cooling policy after 2020, or when the power plant shuts down, construction associated with slip-lining one of the MLPP outfall pipelines would occur primarily at the power plant site. Underwater work in Monterey Bay would consist of attaching a new brine diffuser to the end of the slip-lined pipe and anchoring the diffuser to the ocean floor. Building this outfall would require CalAm to coordinate and enter into appropriate agreements with Dynegy.

5.3.4.7 Outfall Option 7 – New Outfall at Moss Landing

This outfall option uses the same outfall location as the proposed DeepWater Desal, LLC Monterey Bay Regional Water Project. However, compared to the DeepWater Desal Project this analysis assumes that the size of the outfall and the associated pipeline has been scaled down to meet the needs of the 9.6 mgd project proposed by CalAm. The option would include the following three components:

- A discharge diffuser structure;
- A brine pump station; and
- Discharge pipelines.

The discharge diffuser structure would be located in Monterey Bay, approximately 3,400 feet offshore from the Mean High Water Level in the waters of MBNMS and would be secured to the seafloor. The planned elevation of the discharge diffuser structure is approximately 76 feet below Mean Lower Low Water.

The multi-jet diffuser structure would be located on the seafloor and would consist of standing pipe risers emerging from a single 24-inch pipe manifold that would be connected to the end of the discharge pipeline. Each riser would be fitted with a duckbill diffuser nozzle. The diffuser structure would be buried in riprap protective cover and ballast stone. Only the duckbill diffuser nozzles would extend above the protective cover.

5.3.4.8 Outfall Screening Summary

All seven outfall options considered were determined to be feasible and were carried forward for evaluation. The evaluation step compares the impacts of each outfall option against the proposed use by the MPWSP of the existing MRWPCA outfall to determine if adverse impacts would be reduced. This step is described in Section 5.3.6.

5.3.5 Desalination Plant Site Options Screening Results

This analysis considers three alternative locations for the MPWSP Desalination Plant. The desalination plant site options are summarized in **Table 5.3-3** below, and shown on **Figures 5.3-1** and **5.3-2**. The option that was not carried forward into this analysis is described in **Appendix I2**, while the options that were retained for further evaluation are described below (Sections 5.3.5.1 and 5.3.5.2). The primary considerations for the desalination plant site options are the suitability, availability, and proximity of the sites to the possible locations of intake and outfall facilities. For this analysis, it is assumed that the desalination facilities described in Chapter 3, Description of the Proposed Project, for the Charles Benson Road site would be required at all of the desalination plant site options, and that a minimum of 10 acres is needed to accommodate these facilities. As such, this section focuses on the physical footprint of the desalination facilities and does not evaluate different treatment processes. Although the pre-treatment requirements could vary depending on the quality of the source water (open-water vs. subsurface intake), it is assumed that any modifications to the desalination processes could be accommodated within the same footprint.[14]

TABLE 5.3-3
DESALINATION PLANT SITE OPTIONS SCREENING RESULTS

Figure ID	Site	Description	Screening Results
Plant-1	North Marina Armstrong Ranch Property	This 320-acre site, a portion of which is owned by the Marina Coast Water District, is located south of the MRWPCA Regional Wastewater Treatment Plant and the Monterey Regional Environmental Park. The site is used for agriculture and grazing. The desalination plant would be built on 10 acres of land.	*Not Carried Forward because this site, while previously-approved by the CPUC as part of the Regional Project, is owned by MCWD and is no longer available to CalAm.*
Plant-2	Moss Landing National Marine Refractories Site	This site, owned by Moss Landing - Business Park, LLC, is located on Highway 1, southeast of the Dolan Road/ Highway 1 intersection, across Dolan Road from the Moss Landing Power Plant. This is the former Kaiser Refractories Moss Landing Magnesia Plant site. The desalination plant would be built on 25 acres of the 183-acre site.	*Retained for Further Analysis*
Plant-3	Moss Landing Power Plant East Tank Farm Parcel	This 110-acre site, owned by Dynegy, is located on Dolan Road, approximately 1,500 feet east of the Moss Landing Power Plant.	*Retained for Further Analysis*

[14] For example, the pretreatment requirements are determined by the quality of the source water. The conceptual design for the MPWSP Desalination Plant at the Charles Benson Road site is based on the pretreatment requirements for a subsurface intake system. If an open-water intake were used, adjustments to the pretreatment system could be required.

5.3.5.1 Desalination Plant Site Option 1 – Armstrong Ranch at North Marina

This desalination plant option would be located on approximately 10 acres of the 320-acre Armstrong Ranch parcel, which is situated south of and adjacent to the MRWPCA Regional Wastewater Treatment Plant and the Monterey Regional Environmental Park. The Marina Coast Water District currently owns this site, which was evaluated in the Coastal Water Project EIR as the location for the desalination plant for the North Marina and Regional Project alternatives, and it was not carried forward into the alternatives evaluation. See **Appendix I2**. Given that Marina Coast Water District currently owns the property, and that CalAm already owns the 46-acre Charles Benson Road site, which is located approximately 0.75 mile to the north, and since Site Option 1 does not provide any advantage over the Charles Benson Road site, it was not carried forward.

5.3.5.2 Desalination Plant Site Option 2 – Moss Landing National Refractories Site

Site Option 2 is the National Refractories site owned by Moss Landing Business Park, LLC. It is located at 7697 Highway 1 in Moss Landing, southeast of the intersection of Dolan Road and Highway 1, across from the Moss Landing Power Plant. The desalination plant would be built on approximately 25 acres of the 183-acre parcel.[15] This site option is also proposed by Moss Landing Business Park, LLC as the location of a desalination plant for the Peoples' Moss Landing Desalination Project.

This is the site of the former Kaiser Refractories Moss Landing Magnesia Plant, which used to extract magnesium from seawater, but which closed in February 1999 (Landmark Realty, 2011). The site is located in unincorporated Monterey County. The *Moss Landing Community Plan* zones this site as HI (CZ) – Heavy Industrial (Coastal Zone) (Monterey County, 1982).

Approximately 25 acres of the parcel are available for purchase or lease. Some existing structures at the site could be incorporated into the desalination plant design, including buildings, access roads, and parking lots.

5.3.5.3 Desalination Plant Site Option 3 – Moss Landing Power Plant East Tank Farm Parcel

This parcel, which is also called the East Tank Farm Parcel, is located on the north side of Dolan Road, approximately 1.5 miles east of State Route 1 (SR-1), just east of the unincorporated community of Moss Landing, in the unincorporated area of Monterey County. The 110-acre site is bordered by Dolan Road on the south, by the Moss Landing Power Plant on the west, and by predominantly agricultural lands and the Elkhorn Slough to the north and east. Only 25 acres of the site would be required for the desalination plant. The site contains some remnants of

[15] The gross acreage of APN No. 133-172-013, National Refractories is 183 acres; however, a portion of the land consists of wetlands and Moro-Cojo Slough as well as areas affected by flooding. Therefore, the net usable area of the parcel is estimated to be 165 acres.

equipment used at the tank farm, such as pipelines and empty electrical cabinets. Many of the earthen berms that surrounded the fuel oil tanks remain in place.

The *Monterey County General Plan* designates the East Tank Farm Parcel for Heavy Industrial Coast Dependent use. Building a desalination plant at this site would require that CalAm purchase or lease the land from Dynegy.

5.3.5.4 Desalination Plant Site Screening Summary

Two desalination site options were determined to be feasible and were carried forward for evaluation. The next step compares each desalination plant site against the proposed project plant site to determine if adverse impacts would be reduced. This evaluation step is described in Section 5.3.6.

5.3.6 Evaluation of Intake, Outfall, and Desalination Plant Options

This section evaluates the relative environmental effects of the intakes, outfalls and desalination plant sites that were carried forward from the prior screening step, compared against the components of the proposed MPWSP. For each environmental topic presented in Chapter 4, a comparison of impacts is presented in **Tables 5.3-4**, **5.3-5**, and **5.3-6** for intakes, outfalls and desalination plant sites respectively. The components that are determined through the evaluation to avoid or reduce potential environmental impacts are used to compile whole alternatives in Section 5.4 that are evaluated against the proposed project in Section 5.5.

Tables 5.3-4 through 5.3-6 present summary descriptions of the potential environmental impacts associated with the implementation of a particular component of the proposed project, as described in Chapter 4. The impacts of the component options are described comparatively using the following descriptors:

- **Similar** – impacts would be identical or would be of the same general magnitude as the MPWSP proposed component
- **Increased** – impacts would be notably greater than the proposed MPWSP component
- **Decreased** – impacts would be notably less than the proposed MPWSP component

5.3.6.1 Evaluation Results for Intake, Outfall and Desalination Plant Options

Intake Options

Three types of intake options were compared against the proposed slant wells in **Table 5.3-4**:

- Alternative subsurface slant well location (Intake Option 3) – comparison showed a mix of increased, similar, and decreased environmental effects.

- Alternative subsurface well technology (Intake Option 13) – comparison showed similar environmental effects as the proposed slant wells for all environmental topic areas.
- Open water intake facilities and locations (Intake Options 2, 4, 6, 8, and 9) – comparison showed a mix of increased, similar, and decreased environmental effects.

Alternative Subsurface Well Location

Intake Option 3, Slant Wells at Potrero Road, would provide an optional location for slant wells behind (east of) the dunes, in the parking lot at the end of Potrero Road. This location would avoid impacts associated with coastal erosion and would reduce potential impacts on sensitive biological resources at the proposed CEMEX site, but would be located in a 100-year flood plain. During construction, this option would require the temporary closure of the parking lot for the state park and would have increased noise and access impacts on nearby residences. Because Intake Option 3 would decrease some environmental effects (while increasing others) compared with the proposed project, it is carried forward for development into “whole” alternatives (Alternative 1 in Section 5.4).

Alternative Subsurface Well Technology

Ranney wells (Intake Option 13) were shown to result in similar environmental effects compared to the proposed slant wells, resulting in neither increased or decreased impacts. Ranney wells do offer an opportunity to replace slant well technology at either the CEMEX or the Potrero Road site if necessary. However, because no difference in environmental effects was demonstrated, it is unnecessary to carry it forward for analysis.

Open-water Intake Facilities and Locations

As discussed previously in Section 5.3.1, the CCC, MBNMS, SWRCB, and other resource agencies will not consider permitting an open-water intake unless a subsurface intake is proven to be infeasible or would result in greater environmental impacts. Although not anticipated, a subsurface intake could be deemed infeasible. If it were not possible to implement a subsurface intake for the proposed MPWSP, CalAm would need to consider an open-water intake (presented as Intake Options 2, 4, 6, 8, and 9). However, it is unnecessary to analyze every possible open water intake facility and location. Therefore, the comparison presented in Table 5.3-4 was used to identify the open water intake option capable of reducing environmental effects to the greatest degree possible, as described below.

Open-water options at Moss Landing (Options 6, 8 and 9) would avoid the noise and construction impacts at North of CEMEX (Option 2) and Potrero Road (Option 4) because of the existing industrial land uses in the Moss Landing area; however, no entrainment or impingement studies have been performed at either of these locations. Of the Moss Landing open-water options evaluated, Intake Option 8 (MLPP) would have fewer construction-related impacts because it would involve a modification to an existing facility. Intake Option 6 would have the greatest potential for construction-related impacts of the open-water options evaluated, due to the need to remove the existing diffuser and replace it with a new riser and wedgewire screens; due to structural modifications that would be required on the land side; and due to the impacts associated with installing and securing a length of new pipeline and riprap armoring on the seafloor.

TABLE 5.3-4
INTAKE OPTIONS EVALUATION – PRELIMINARY COMPARISON OF DIRECT ENVIRONMENTAL IMPACTS

Proposed Project: Subsurface Slant Wells in CEMEX Active Mining Area [includes associated facilities as far as Highway 1] *(new construction)*	**Intake Option 2: Open-Water Intake at North CEMEX** *(new construction)*	**Intake Option 3: Subsurface Slant Wells at Potrero Road** *(new construction)*	**Intake Option 4: Open-Water Intake at Potrero Road** *(new construction)*	***Intake Option 6: Open-Water Intake at Moss Landing*** *(new construction; use of existing caisson)*	***Intake Option 8: Open-Water Intakes at Moss Landing Power Plant*** *(new connections to existing intake screens)*	***Intake Option 9: Open-Water Intake at Moss Landing*** *(new construction)*	**Intake Option 13: Ranney Wells at CEMEX Active Mining Area** (new construction)
4.2 GEOLOGY, SOILS, AND SEISMICITY							
Construction Activities: Construction would have an LSM impact related to potential increased soil and sand erosion.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
Operations and Facility Siting: LS impact related to exposure of people or structures to seismically-induced ground-shaking, or liquefaction and lateral spreading. LSM impact related to exposure of structures to coastal erosion and bluff retreat caused by sea level rise.	**Decreased.** No coastal erosion or bluff retreat impact. All other impacts would be similar to those of the proposed project.	**Decreased.** No coastal erosion or bluff retreat impact. All other impacts would be similar to those of the proposed project.	**Decreased.** No coastal erosion or bluff retreat impact. All other impacts would be similar to those of the proposed project.	**Increased.** Coastal erosion and scour from the caisson would be exacerbated by sea level rise. All other impacts would be similar to those of the proposed project.	**Decreased.** No coastal erosion or bluff retreat impact. All other impacts would be similar to those of the proposed project.	**Decreased.** No coastal erosion or bluff retreat impact. All other impacts would be similar to those of the proposed project.	**Similar.**
4.3 SURFACE WATER HYDROLOGY AND WATER QUALITY							
Construction Activities LS impact related to degradation of water quality due to soil erosion or toxic chemical releases and discharge of water produced during well drilling and development. No water quality impact from discharges of treated water and disinfectant from well drilling and development, however, LSM water quality impacts from discharges of treated water and disinfectant during Source Water Pipeline construction.	**Increased.** Greater impacts on water quality in Monterey Bay due to in-water construction activities.	**Similar.**	**Increased.** Greater impacts on water quality in Monterey Bay due to in-water construction activities.	**Increased.** Greater impacts on water quality in Monterey Bay due to in-water construction activities.	**Similar.**	**Increased.** Greater impacts on water quality in Monterey Bay due to in-water construction activities.	**Similar.**
Operations and Facility Siting: No alteration in drainage patterns such that on or offsite flooding would increase or the capacity of the stormwater drainage system would be exceeded. LS water quality impact due to slant well maintenance; increased erosion, siltation, and surface runoff due to alteration of drainage patterns; impedance or redirection of flood flows due to siting facilities in a 100-year flood hazard area; and exposure of people or structures to risk of loss, injury or death from flooding due to tsunamis or sea level rise.	**Similar.**	**Increased.** The parking lot at Potrero Road is within the 100-year flood zone. All other impacts would be similar to that of the proposed slant wells.	**Similar.**	**Similar.**	**Similar.**	**Decreased.** No impacts associated with siting facilities in a 100-year flood hazard area. Less impact related to tsunamis and sea level rise flooding because above ground facilities are outside the respective flood area.	**Similar.**
4.4 GROUNDWATER RESOURCES							
Construction Activities: LS impact related to interference with groundwater recharge, violation of any water quality standard, or degradation of groundwater quality.	**Decreased.** No impact.	**Similar.**	**Decreased.** No impact.	**Decreased.** No impact.	**Decreased.** No impact.	**Decreased.** Construction would have no impact related to interference of groundwater recharge, depletion of supplies, or water quality.	**Similar.** Construction would be similar to those of the proposed project. The same APMM identified for the proposed project would be implemented for this option.
Operations and Facility Siting: LSM impact related to depletion of groundwater supplies or interference with groundwater recharge and LSM impact related to violating water quality standards.	**Decreased**. Open-water intakes would not affect groundwater.	**Increased.** Operation and siting would be greater than the proposed project due to a greater percentage of feedwater coming from the groundwater basin. The APMM identified under the proposed project would also be applied for this option.	**Decreased**. Operational impacts would be decreased because the open-water intakes would not affect groundwater.	**Decreased**. Operational impacts would be decreased because the open-water intakes would not affect groundwater.	**Decreased**. Operational impacts would be decreased because the open-water intakes would not affect groundwater.	**Decreased**. Operational impacts would be decreased because the open-water intakes would not affect groundwater.	**Similar.** Operational impacts would be similar to those of the proposed project. The same APMM identified for the proposed project would be implemented for this option.

TABLE 5.3-4 (Continued)
INTAKE OPTIONS EVALUATION – PRELIMINARY COMPARISON OF DIRECT ENVIRONMENTAL IMPACTS

Proposed Project: Subsurface Slant Wells in CEMEX Active Mining Area [includes associated facilities as far as Highway 1] *(new construction)*	**Intake Option 2: Open-Water Intake at North CEMEX** *(new construction)*	**Intake Option 3: Subsurface Slant Wells at Potrero Road** *(new construction)*	**Intake Option 4: Open-Water Intake at Potrero Road** *(new construction)*	***Intake Option 6: Open-Water Intake at Moss Landing*** *(new construction; use of existing caisson)*	***Intake Option 8: Open-Water Intakes at Moss Landing Power Plant*** *(new connections to existing intake screens)*	***Intake Option 9: Open-Water Intake at Moss Landing*** *(new construction)*	**Intake Option 13: Ranney Wells at CEMEX Active Mining Area** (*new construction*)
4.5 MARINE BIOLOGICAL RESOURCES							
Construction Activities: LS impact on candidate, sensitive, or special status species; and no impact related to interference with the movement of native resident or migratory fish or wildlife species. Operations and Facility Siting: LS impacts on candidate, sensitive, or special status species; potential conflict with provisions of an adopted habitat conservation plan (or similar plan); and interference with the movement of any native resident or migratory fish or wildlife species.	**Increased.** Impacts would be increased, except for the impact on the movement of fish or wildlife species during. New mitigation measures would be required to reduce the impacts resulting from entrainment and impingement to less than significant. Operational impacts associated with impingement and entrainment would be greater and could be substantial if feasible mitigation is not available.	**Similar.** Impacts would be similar to and potentially less than those of the proposed project because the slant wells would be located farther back from the high tide line.	**Increased.** Impacts would be increased, except for the impact on the movement of fish or wildlife species during construction. New mitigation measures would be required to reduce the impacts resulting from entrainment and impingement to less than significant. Operational impacts associated with impingement and entrainment would be greater and could be substantial if feasible mitigation were not available.	**Increased.** Impacts would be increased, except for the impact on the movement of fish or wildlife species during construction. New mitigation measures would be required to reduce the impacts resulting from entrainment and impingement to less than significant. Operational impacts associated with impingement and entrainment would be greater and could be substantial if feasible mitigation were not available.	**Increased.** Construction impacts would be decreased because connection with existing screen would be inland. Impacts from operation would be increased and new mitigation measures would be required to reduce the impacts resulting from entrainment and impingement to less than significant. Operational impacts associated with impingement and entrainment would be greater and could be substantial if feasible mitigation were not available.	**Increased.** Impacts would be increased, except for the impact on the movement of fish or wildlife species during construction. New mitigation measures would be required to reduce the impacts resulting from entrainment and impingement to less than significant. Operational impacts associated with impingement and entrainment would be greater and could be substantial if feasible mitigation were not available.	**Similar.**
4.6 TERRESTRIAL BIOLOGICAL RESOURCES							
Construction Activities: LSM impact on candidate, sensitive, or special-status species; riparian habitat, critical habitat or other sensitive natural communities; and federal wetlands, federal other waters, and/or waters of the State. Construction would not conflict with local tree ordinances.	**Decreased.** The impact of intake construction would be reduced since the construction area would be located within agricultural land behind the sand dunes. The construction area does not support federal wetlands, federal other waters, and /or waters of the State riparian areas, critical habitat, or sensitive natural communities so would not impact these resources. The intake would have similar impacts on candidate, sensitive, or special-status species. The intake would not conflict with local tree ordinances as there are no trees within the impact area.	**Decreased.** The intake construction would be located in a parking lot behind the sand dunes and would not directly impact sensitive natural communities or wetlands. However, wetlands, central dune scrub and other sensitive natural communities are located adjacent to the work area and could be impacted during construction. This intake would have a similar level of impacts on candidate, sensitive, or special-status species; riparian habitat, critical habitat, or other sensitive natural communities; and federal wetlands, federal other waters, and/or waters of the State. The intake would not conflict with local tree ordinances as there are no trees within the impact area.	**Decreased.** The intake construction would be located in a parking lot behind the sand dunes and would not directly impact sensitive natural communities or wetlands. However, wetlands, central dune scrub and other sensitive natural communities are located adjacent to the work area and could be impacted during construction. This intake would have a similar level of impacts on candidate, sensitive, or special-status species; riparian habitat, critical habitat, or other sensitive natural communities; and federal wetlands, federal other waters, and/or waters of the State. The intake would not conflict with local tree ordinances as there are no trees within the impact area.	**Decreased.** Construction of this intake includes construction of a new pump station onshore in ruderal or non-native grassland areas. No riparian habitat, critical habitat, or sensitive natural communities occur at the pump station site, so there would be a decreased level of impact on these resources This area could support special-status species and would have a similar level of impact on candidate, sensitive, or special-status species. The pump station would be located adjacent to Moss Landing Harbor, a potential federal and State other water and construction of the pump station could impact this feature. This intake would have a similar level of impact on federal wetlands, federal other waters, and/or waters of the State. No riparian habitat, critical habitat, or sensitive natural communities occur at the pump station site. There are trees located at the pump station site. Impacts on these trees could conflict with local tree ordinances and the impact would be similar.	**Decreased.** Construction/modification of this intake includes construction of a new pump station onshore in currently developed or ruderal areas with non-native trees. No riparian habitat, critical habitat, or sensitive natural communities occur at the pump station site, so there would be a decreased level of impacts on these resources. This area could support special-status species and therefore, similar to the proposed project, this impact would have a similar level of impact on candidate, sensitive, or special-status species. The pump station would be located adjacent to Moss Landing Harbor, and construction of the pump station could impact a similar level of federal wetlands, federal other waters, and/or waters of the State. There are trees located at the pump station site. Impacts on these trees could conflict with local tree ordinances and the impact would be similar.	**Increased.** Construction of the intake would occur within ruderal and agricultural areas dominated by non-native grassland and non-native trees and would not directly impact sensitive natural communities or wetlands. However, the construction area would be located adjacent to wetlands, riparian areas, and sensitive natural communities associated with Elkhorn Slough and these areas could be impacted by construction. This intake would have a similar level of impacts on candidate, sensitive, or special-status species; riparian habitat, critical habitat, or other sensitive natural communities; and federal wetlands, federal other waters, and/or waters of the State. There are trees located at the pump station site. Impacts on these trees could conflict with local tree ordinances and the impact would be similar.	**Similar.** The impact of the intake construction would be similar to the MPWSP project intake as construction would occur at the same location and have the same construction disturbance area as the proposed project.

TABLE 5.3-4 (Continued)
INTAKE OPTIONS EVALUATION – PRELIMINARY COMPARISON OF DIRECT ENVIRONMENTAL IMPACTS

Proposed Project: Subsurface Slant Wells in CEMEX Active Mining Area [includes associated facilities as far as Highway 1] *(new construction)*	**Intake Option 2: Open-Water Intake at North CEMEX** *(new construction)*	**Intake Option 3: Subsurface Slant Wells at Potrero Road** *(new construction)*	**Intake Option 4: Open-Water Intake at Potrero Road** *(new construction)*	***Intake Option 6: Open-Water Intake at Moss Landing*** *(new construction; use of existing caisson)*	***Intake Option 8: Open-Water Intakes at Moss Landing Power Plant*** *(new connections to existing intake screens)*	***Intake Option 9: Open-Water Intake at Moss Landing*** *(new construction)*	**Intake Option 13: Ranney Wells at CEMEX Active Mining Area** (*new construction*)
4.6 TERRESTRIAL BIOLOGICAL RESOURCES (cont.)							
Operations and Facility Siting: LSM impact on candidate, sensitive, or special-status species; riparian habitat, critical habitat, or other sensitive natural communities; and federal wetlands, federal other waters, and/or waters of the State. No conflict with adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan since it is not located within any of these plan areas, therefore NI.	**Decreased.** Operational activities would not impact federal wetlands, other federal waters, or waters of the State, riparian areas, critical habitat, or sensitive natural communities. Similar to the proposed project, the intake would not conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan since it is not located within any of these plan areas.	**Similar.** Operational impacts would be similar since periodic maintenance cleaning would occur in the parking lot adjacent to sensitive biological resources and would have a similar level of impact related to the adverse effects on species identified as candidate, sensitive, or special-status; riparian habitat, critical habitat, or other sensitive natural communities; and federal wetlands, federal other waters, and/or waters of the State. Similar to the proposed project, the intake would not conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan since it is not located within any of these plan areas.	**Decreased.** Operational activities would not impact federal wetlands, other federal waters, or waters of the State, riparian areas, critical habitat, or sensitive natural communities. Similar to the proposed project, the intake would not conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan since it is not located within any of these plan areas.	**Decreased.** Operational activities would not impact federal wetlands, other federal waters, or waters of the State, riparian areas, critical habitat, or sensitive natural communities. Similar to the proposed project, the intake would not conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan since it is not located within any of these plan areas.	**Decreased.** Operational activities would not impact federal wetlands, other federal waters, or waters of the State, riparian areas, critical habitat, or sensitive natural communities. Similar to the proposed project, the intake would not conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan since it is not located within any of these plan areas.	**Decreased.** Operational activities would not impact federal wetlands, other federal waters, or waters of the State, riparian areas, critical habitat, or sensitive natural communities. Similar to the proposed project, the intake would not conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan since it is not located within any of these plan areas.	**Similar.**
4.7 HAZARDS AND HAZARDOUS MATERIALS							
Construction Activities: LS impacts related to transport, use and disposal of hazardous materials and the risk of fire during construction; LSM impact related to potential release of hazardous materials; and NI associated with siting the slant wells on a known hazardous materials site or with hazardous materials handling or emissions within 0.25 mile of a school.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
Operations and Facility Siting: Operation would have LS impacts related to the transport, use, and disposal of hazardous materials; and NI related to hazardous materials handling or emissions within 0.25 mile of a school or airport hazards.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.8. LAND USE, LAND USE PLANNING, AND RECREATION							
Construction, Operations, and/or Facility Siting Operation would have LS impacts related to consistency with applicable land use plans, policies, and regulations.	**Similar.**	**Increased.** Construction would have an increased but mitigable impact associated with disruption of established recreational land uses or closure of a recreational facility because it would require the temporary closure of the state beach parking. Operations would have an increased but	**Increased.** Construction would have an increased but mitigable impact associated with disruption of established recreational land uses because it would require the temporary closure of the state beach parking lot. Operational impacts would also be increased but mitigable	**Similar.**	**Increased.** Impacts would be increased because in-water work at the intakes screens result in an increased impact on recreational and commercial uses at the harbor. This temporary impact could be mitigated.	**Increased.** The impact associated with construction of this intake would be similar to that of the proposed project. The impacts associated with operation of the above-ground intake facilities would be increased compared to those of the proposed slant wells because the impacts	**Similar.**

TABLE 5.3-4 (Continued)
INTAKE OPTIONS EVALUATION – PRELIMINARY COMPARISON OF DIRECT ENVIRONMENTAL IMPACTS

Proposed Project: Subsurface Slant Wells in CEMEX Active Mining Area [includes associated facilities as far as Highway 1] *(new construction)*	**Intake Option 2: Open-Water Intake at North CEMEX** *(new construction)*	**Intake Option 3: Subsurface Slant Wells at Potrero Road** *(new construction)*	**Intake Option 4: Open-Water Intake at Potrero Road** *(new construction)*	***Intake Option 6: Open-Water Intake at Moss Landing*** *(new construction; use of existing caisson)*	***Intake Option 8: Open-Water Intakes at Moss Landing Power Plant*** *(new connections to existing intake screens)*	***Intake Option 9: Open-Water Intake at Moss Landing*** *(new construction)*	**Intake Option 13: Ranney Wells at CEMEX Active Mining Area** (*new construction*)
4.8. LAND USE, LAND USE PLANNING, AND RECREATION (cont.)							
		mitigable impact related to land use compatibility because, it is assumed, the parking lot would have to be closed about every 5 years for slant well maintenance.	because of the permanent displacement of a portion of the parking lot for the intake pump station and because operation of the pump station would increase ambient noise levels.			associated with consistency with land use plans, policies, and regulations and with land use compatibility would be increased compared to the proposed project, due to the location of the preferred wet well and pump station in an area designated for agricultural use. New mitigation would need to be developed to reduce the impact.	
4.9 TRAFFIC AND TRANSPORTATION							
<u>*Construction Activities:*</u> LSM impacts from Source Water Pipeline construction-related increase in traffic safety hazards due to potential conflicts between large construction vehicles and other vehicles, bicyclists, and pedestrians; wear and tear on smaller haul-route roadways caused by heavy trucks transporting equipment and material to and from construction work areas; reduction in roadway capacity; emergency access impairment and the potential to impede vehicular, bicycle, or pedestrian traffic flow or disrupt public transportation.	**Similar.**	**Increased.** Impacts would be increased compared to those of the proposed project slant wells because the impact related to parking conditions would require partial or complete closure of the parking lot during construction. This impact could be reduced through mitigation.	**Increased.** Impacts would be increased compared to those of the proposed project slant wells because the impact related to parking conditions would require partial or complete closure of the parking lot during construction. This impact could be reduced through mitigation.	**Decreased.** Impacts associated with increased traffic safety hazards; and wear and tear on smaller haul routes would be somewhat less than those of the proposed project because this intake would involve less overall construction, and therefore fewer construction	**Decreased.** Impacts associated with, increased traffic safety hazards; and wear and tear on smaller haul routes would be somewhat less than those of the proposed project because this intake would involve less overall construction, and therefore fewer construction	**Decreased.** Impacts associated with increased traffic safety hazards; and wear and tear on smaller haul routes would be somewhat less than those of the proposed project because this intake would involve less overall construction, and therefore fewer construction	**Similar.**
The proposed project would have LS impacts related to temporary increase in traffic and parking conditions in public areas.		All other impacts would be similar to those of the proposed project.	All other impacts would be similar to those of the proposed project.	related trips and a shorter construction period; however the impact determination would remain the same as the proposed project.	related trips and a shorter construction period; however the impact determination would remain the same as the proposed project.	related trips and a shorter construction period; however the impact determination would remain the same as the proposed project.	
4.10 AIR QUALITY							
<u>*Construction Activities:*</u> In conjunction with other project components, LSM impact related to the generation of criteria air pollutants that could exceed ambient air quality standards. LS impact related to the exposure of sensitive receptors to pollutant concentrations and objectionable odors.	**Decreased.** Emissions over the duration of the construction period would be somewhat less because of less construction activity.	**Similar.** Emissions over the duration of the construction period would be somewhat less because of less construction activity. Somewhat greater exposure of sensitive receptors to construction-related pollutants due to closer proximity of slant well drill sites (within 1,000 feet) and Source Water Pipeline (within 50 feet) to a residential area. Net impacts would be similar.	**Similar.** Emissions over the duration of the construction period would be somewhat less because of less construction activity. Somewhat greater exposure of sensitive receptors to construction-related pollutants due to closer proximity of slant well drill sites (within 1,000 feet) and Source Water Pipeline (within 50 feet) to a residential area. Net impacts would be similar.	**Similar.** Emissions over the duration of the construction period would be somewhat less because of less construction activity. Somewhat greater exposure of sensitive receptors to construction-related pollutant concentrations would be similar; although a residence and RV park on Moss Landing Road would be within 500 feet the construction activities associated with the pump station, the amount of emissions and overall construction period would be expected to be less. Net impacts would be similar.	**Similar.** Although daily construction-related emissions would be similar, emissions over the duration of the construction period would be somewhat less because of less construction activity. The applicable MMs identified for the proposed project would apply and impacts would be LSM. Although an RV park on Moss Landing Road would be within 1,350 feet the construction activities associated with the pump station; exposure of sensitive receptors to construction-related pollutant concentrations would be less due to the reduced amount of emissions that would be emitted. The impact classification would be the same, LS.	**Decreased.** Emissions over the duration of the construction period would be somewhat less because of less construction activity.	**Similar.**

TABLE 5.3-4 (Continued)
INTAKE OPTIONS EVALUATION – PRELIMINARY COMPARISON OF DIRECT ENVIRONMENTAL IMPACTS

Proposed Project: Subsurface Slant Wells in CEMEX Active Mining Area [includes associated facilities as far as Highway 1] *(new construction)*	**Intake Option 2: Open-Water Intake at North CEMEX** *(new construction)*	**Intake Option 3: Subsurface Slant Wells at Potrero Road** *(new construction)*	**Intake Option 4: Open-Water Intake at Potrero Road** *(new construction)*	***Intake Option 6: Open-Water Intake at Moss Landing*** *(new construction; use of existing caisson)*	***Intake Option 8: Open-Water Intakes at Moss Landing Power Plant*** *(new connections to existing intake screens)*	***Intake Option 9: Open-Water Intake at Moss Landing*** *(new construction)*	**Intake Option 13: Ranney Wells at CEMEX Active Mining Area** (*new construction*)
4.10 AIR QUALITY (cont.)							
Operations and Facility Siting: Operation of the proposed slant wells and associated intake facilities would have no impact related to the generation of emissions of criteria pollutants that could contribute to an exceedance of an ambient air quality standard; and would have NI related to the exposure of sensitive receptors to substantial pollutant concentrations.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.11 GREENHOUSE GASES							
Construction, Operations, and/or Facility Siting: Construction and operation amortized over 40 years would have LSM impacts related to GHG emissions and potential conflicts with Executive Order S-3-05 and AB 32.[16]	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.12 NOISE AND VIBRATION							
Construction Activities: LS impact from increase in ambient noise levels; exposure of people to, or generation of, noise levels in excess of established standards; and exposure of people to, or generation of, excessive groundborne vibration. However, Source Water Pipeline construction would have an LSM impact related to excessive groundborne vibration. Construction would conflict with construction time limits of the City of Marina. *Operations and Facility Siting:* LS impact related to permanent increase in ambient noise levels and exposure of people to, or generation of, operational noise levels in excess of established standards.	**Similar.**	**Increased.** Nighttime construction would result in sleep interference due to increased proximity of sensitive receptors compared with the proposed project and require mitigation. Vibration impacts would be decreased because construction would not occur adjacent to historic structures. All other noise impacts associated with construction and operation would be similar to the proposed project.	**Increased.** Nighttime construction would result in sleep interference due to increased proximity of sensitive receptors, and because operation of the intake pump station, could increase the ambient noise level by 5 or more dBA and require mitigation. Vibration impacts would be decreased because construction would not occur adjacent to historic structures. All other noise impacts associated with construction and operation would be similar to the proposed project.	**Decreased.** Construction activity would be further from sensitive land uses. Vibration impacts would be decreased because construction would not occur adjacent to historic structures. All other noise impacts associated with construction and operation would be similar to the proposed project.	**Decreased.** Use of the existing intakes would require substantially less construction activity and would occur further from sensitive land uses. Vibration impacts would be decreased because construction would not occur adjacent to historic structures. All other noise impacts associated with construction and operation would be similar to the proposed project.	**Decreased.** Construction activity would be further from sensitive land uses. Vibration impacts would be decreased because construction would not occur adjacent to historic structures. All other noise impacts associated with construction and operation would be similar to the proposed project.	**Similar.**
4.13 PUBLIC SERVICES AND UTILITIES							
Construction, Operations, and/or Facility Siting: LSM impact related to subsurface utilities disruption or relocation. No impact on landfill capacity but LSM impact on State or local recycling goals and waste diversion rates. LS impact on landfill capacity and state or local recycling goals; no impact related to the need for additional wastewater treatment or conveyance capacity.	**Similar.**	**Similar.**	**Similar.**	**Decreased.** Would result in less impact related to disruption or relocation of existing subsurface utilities. Other impacts would be similar.	**Similar.**	**Similar.**	**Similar.**

[16] Mitigation Measure 4.11-1, GHG Reductions Plan, requires net zero indirect emissions from electricity use during operation, which would reduce the significance impacts related to greenhouse gas emissions from significant and unavoidable to less than significant with mitigation.

TABLE 5.3-4 (Continued)
INTAKE OPTIONS EVALUATION – PRELIMINARY COMPARISON OF DIRECT ENVIRONMENTAL IMPACTS

Proposed Project: Subsurface Slant Wells in CEMEX Active Mining Area [includes associated facilities as far as Highway 1] *(new construction)*	**Intake Option 2: Open-Water Intake at North CEMEX** *(new construction)*	**Intake Option 3: Subsurface Slant Wells at Potrero Road** *(new construction)*	**Intake Option 4: Open-Water Intake at Potrero Road** *(new construction)*	***Intake Option 6: Open-Water Intake at Moss Landing*** *(new construction; use of existing caisson)*	***Intake Option 8: Open-Water Intakes at Moss Landing Power Plant*** *(new connections to existing intake screens)*	***Intake Option 9: Open-Water Intake at Moss Landing*** *(new construction)*	**Intake Option 13: Ranney Wells at CEMEX Active Mining Area** (*new construction*)
4.14 AESTHETICS							
Construction, Operations and/or Facility Siting: LS construction impact on scenic resources and visual character of the area; LSM impact due to light and glare during nighttime construction. LS operation impact on scenic resources and visual character; no impact related to permanent new sources of light and glare.	**Increased.** Adverse effects on scenic resources and visual character during construction and operations would be somewhat greater at this more primitive, pristine shoreline location. Impacts associated with operation would be similar to those of the proposed project.	**Similar.**	**Similar.**	**Increased.** This option would result in impacts related to effects on scenic resources or the visual character of the area during construction and operation at the pump station on the beach. All other impacts would be similar to the proposed project.	**Similar.**	**Similar.**	**Similar.**
4.15 CULTURAL RESOURCES							
Construction Activities: LSM impact related to a historical resource or historic properties; LSM impacts related to the potential to cause a substantial adverse change in the significance of an archaeological resource and related to the potential inadvertent discovery of human remains; and LS impact related to the destruction of a unique paleontological resource.	**Decreased.** No impact on historical resources or historic properties would occur. Similar impacts for archaeological resources, paleontological resources, and human remains.	**Decreased** No impact on historical resources or historic properties would occur. Similar impacts for archaeological resources, paleontological resources, and human remains.	**Decreased.** No impact on historical resources or historic properties would occur. Similar impacts for archaeological resources, paleontological resources, and human remains.	**Decreased.** No impact on historical resources or historic properties would occur. Similar impacts for archaeological resources, paleontological resources, and human remains.	**Decreased.** No impact on historical resources or historic properties would occur. Similar impacts for archaeological resources, paleontological resources, and human remains.	**Decreased.** No impact on historical resources or historic properties would occur. Similar impacts for archaeological resources, paleontological resources, and human remains.	**Similar.**
4.16 AGRICULTURE AND FOREST RESOURCES							
Construction, Operations, and/or Facility Siting: NI related to the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use; conflict with agricultural zoning or Williamson Act contracts; or otherwise resulting in the conversion of farmland to non-agricultural use. However, those impacts for the Source Water Pipeline would be LSM.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**[17]	**Similar.**
4.17 MINERAL RESOURCES							
Construction, Operations, and/or Facility Siting: LS impact on future recovery of mineral resources and temporary interference with active mining operations at the CEMEX facility.	**Decreased.** This option would not temporarily interfere with active mining operations at the CEMEX sand mining facility.	**Decreased.** This option would not temporarily interfere with active mining operations at the CEMEX sand mining facility.	**Decreased.** This option would not temporarily interfere with active mining operations at the CEMEX sand mining facility.	**Decreased.** This option would not temporarily interfere with active mining operations at the CEMEX sand mining facility.	**Decreased.** This option would not temporarily interfere with active mining operations at the CEMEX sand mining facility.	**Decreased.** This option would not temporarily interfere with active mining operations at the CEMEX sand mining facility.	**Similar.**
4.18 ENERGY RESOURCES							
Construction, Operations, and/or Facility Siting: LSM construction impact associated with the potential wasteful or inefficient use of energy. LS operation impacts due to use of electricity or fuel in an unnecessary, wasteful or inefficient manner and potential to impact, in conjunction with other project components, local or regional energy supplies.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.19 POPULATION AND HOUSING							
Construction, Operations, and/or Facility Siting: Construction and operation would have an LS impact related to direct growth inducement.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**

[17] Pursuant to the Monterey County Land Use Plan North County (1982), the property that would be disturbed for the intake is designated as Industrial – Coast Dependent –Heavy. This has changed from an increased impact to a similar impact from the Draft EIR/EIS to the Final EIR/EIS, because analysis in the Draft EIR/EIS incorrectly stated that the intake location would conflict with agricultural zoning and had the potential to result in conversion of farmland to non-agricultural use.

TABLE 5.3-5
OUTFALL OPTIONS EVALUATION – PRELIMINARY COMPARISON OF DIRECT ENVIRONMENTAL IMPACTS

Proposed Project: Existing MRWPCA Outfall Pipeline *(existing outfall)*	**Outfall Option 1: Modified MRWPCA Outfall and New Diffuser** *(modification of existing outfall pipe plus a new diffuser)*	**Outfall Option 2: New Outfall at North CEMEX** *(new construction)*	**Outfall Option 3: New Outfall at Potrero Road** *(new construction)*	***Outfall Option 4: Modified National Refractories Outfall*** *(modifications to existing outfall, including repairs and new diffuser)*	**Outfall Option 5: New Outfall at Sandholdt Road** *(new construction)*	***Outfall Option 6: New Connection to Existing MLPP Cooling System Outfall CalAm #3***	***Outfall Option 7: New Outfall at Moss Landing [DeepWater Desal Outfall]*** *(new construction)*
4.2 GEOLOGY, SOILS, AND SEISMICITY							
<u>*Construction, Operations, and Facility Siting:*</u> The proposed project outfall would have no construction or operational impacts on geology, soils, or seismicity.	**Similar.** Impacts would be similar to those of the proposed project because this option would modify an existing facility.	**Increased.** There would be an increased potential for soil erosion or loss of topsoil during construction. Impacts from operations and facility siting would be increased because there would be a greater potential for liquefaction.	**Increased**. There would be an increased potential for soil erosion or loss of topsoil during construction. Impacts from operations and facility siting would be increased because there would be a greater potential for liquefaction.	**Increased.** Construction impacts would be similar to those of the proposed project because this is option would modify an existing facility. Impacts from operations and facility siting would be increased because there would be a greater potential for liquefaction. Assuming the outfall facilities would be located in an area of the former National Refractories site that would not be subject to flooding related to sea level rise, all other impacts also would be similar to those of the proposed project outfall.	**Increased**. There would be an increased potential for soil erosion or loss of topsoil during construction. Impacts of operation and siting would be increased due to the potential for the site to be subject to coastal retreat due to sea level rise, and potential for the new pipeline to encounter corrosive soils,. There would also be a greater potential for liquefaction.	**Increased.** Impacts would be similar to those of the proposed project because this is option would modify an existing facility. Impacts from operations and facility siting would be increased because there would be a greater potential for liquefaction.	**Increased.** There would be an increased potential for soil erosion or loss of topsoil during construction. There would be an increased potential for the new pipeline to encounter corrosive soils (proposed project had no impact related to corrosive soils). There would also be a greater potential for liquefaction.
4.3 SURFACE WATER HYDROLOGY AND WATER QUALITY							
<u>*Construction Activities:*</u> No construction- related impacts on surface water hydrology or water quality.	**Increased.** Water quality impacts would increase due to dewatering effluent discharges; as well as from increased soil erosion, inadvertent toxic chemical releases, and treated water and disinfectant discharges from existing and new pipelines.	**Increased**. Water quality impacts would increase due to discharges of dewatering effluent, as well as from increased soil erosion, inadvertent toxic chemical releases and treated water and disinfectant discharges from existing and new pipelines.	**Increased.** Water quality impacts would increase due to discharges of dewatering effluent, as well as from increased soil erosion, inadvertent toxic chemical releases and treated water and disinfectant discharges from existing and new pipelines	**Increased.** Water quality impacts would increase due to discharges of dewatering effluent, as well as from increased soil erosion, inadvertent toxic chemical releases and treated water and disinfectant discharges from existing and new pipelines.	**Increased.** Water quality impacts would increase due to discharges of dewatering effluent, as well as from increased soil erosion, inadvertent toxic chemical releases and treated water and disinfectant discharges from existing and new pipelines.	**Similar.** Impacts would be similar to those of the proposed project because this is an existing facility.	**Increased.** Water quality impacts would increase due to discharges of dewatering effluent, as well as from increased soil erosion, inadvertent toxic chemical releases and treated water and disinfectant discharges from existing and new pipelines
<u>*Operations and Facility Siting:*</u> LS impact related to violation of water quality standards or waste discharge requirements: no plume modeling was conducted and impacts from the brine were not considered for this, or any option. No other impacts related to surface water hydrology or water quality.	**Similar.**	**Increased.** Flooding risk would increase because the eastern end of the outfall (on the east side of the dunes) is in an identified tsunami inundation area, an area at risk of flooding due to sea level rise, and a dam inundation area; the outfall and connecting discharge pipeline would be underground in this area. Other impacts similar to those of the proposed project.	**Increased.** Flooding risk would increase because the eastern end of the outfall (on the east side of the dunes) is in an identified tsunami inundation area, an area at risk of flooding due to sea level rise, and a dam inundation area; the outfall and connecting discharge pipeline would be underground in this area. Other impacts similar to those of the proposed project.	**Increased.** Flooding risk would increase because the eastern end of the outfall (on the east side of the dunes) is in an identified tsunami inundation area, an area at risk of flooding due to sea level rise. The impact would be greater than for Options 2, 3, and 5), because the above-ground facilities associated with this outfall (such as a pump station) are assumed to also be located here. Mitigation would be required. Other impacts would be similar to those of the proposed project.	**Increased**. Flooding risk would increase because the eastern terminus of the outfall (on Sandholdt Road) is in an identified tsunami inundation area, an area at risk of flooding due to sea level rise, and a dam inundation area; the outfall would be underground although the connecting discharge pipeline may be above-ground a short distance away, and therefore vulnerable, if attached to the underside of the Sandholdt Bridge. Other impacts would be similar to those of the proposed project.	**Increased.** Impacts would be increased to an LS impact because the MLPP disengaging basin is in an area at risk of flooding due to sea level rise. All other impacts are similar to the proposed project.	**Increased**. Impacts would be increased to an LS due to risk of flooding due to sea level rise, because the above-ground facilities associated with the outfall (such as the pump station) were located at the former tank farm on Dolan Road (which is where the DeepWater Desal Project proposes to locate a desalination plant and other facilities and is in an area at risk of flooding due to sea level rise). Other impacts would be similar to the proposed project.
4.4 GROUNDWATER RESOURCES							
<u>*Construction Activities:*</u> There would be no construction-related impacts on groundwater resources.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
<u>*Operations and Facility Siting:*</u> There would be no impacts related to operations on groundwater resources.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**

TABLE 5.3-5 (Continued)
OUTFALL OPTIONS EVALUATION – PRELIMINARY COMPARISON OF DIRECT ENVIRONMENTAL IMPACTS

Proposed Project: Existing MRWPCA Outfall Pipeline *(existing outfall)*	**Outfall Option 1: Modified MRWPCA Outfall and New Diffuser** *(new construction to MRWPCA plus modification of existing outfall)*	**Outfall Option 2: New Outfall at North CEMEX** *(new construction)*	**Outfall Option 3: New Outfall at Potrero Road** *(new construction)*	***Outfall Option 4: Modified National Refractories Outfall*** *(modifications to existing outfall, including repairs and new diffuser)*	**Outfall Option 5: New Outfall at Sandholdt Road** *(new construction)*	***Outfall Option 6: New Connection to Existing MLPP Cooling System Outfall CalAm #3***	***Outfall Option 7: New Outfall at Moss Landing [DeepWater Desal Outfall]*** *(new construction)*
4.5 MARINE BIOLOGICAL RESOURCES							
Construction Activities: There would be no construction-related impacts on marine resources.	**Increased.** Marine biological impacts would be greater because attaching and anchoring the diffuser would involve in-water work and disturbance of the seafloor within MBNMS. Impacts include: physical disruption of sediments and mortality of resident epifauna and infauna; increased turbidity from sediment resuspension; and disruption of foraging by bottom-feeding fishes. New mitigation would be required to ensure appropriate procedures and/or timing to reduce potential impacts.	**Increased.** Marine biological impacts would be greater because the new outfall pipeline would be located in MBNMS and entail disturbance of the seafloor and in-water work where the outfall pipeline emerges from subsurface and the diffuser was attached and anchored. Impacts on marine resources would be due to the physical disruption of the sediments and mortality of resident epifauna and infauna, increased turbidity from sediment resuspension and disruption of foraging by bottom-feeding fishes. The construction zone runs through sensitive habitat within approximately 0.5 mile of shore used by numerous surf perches, grunion, seabass, smelt and squid for spawning, mostly in the spring and summer months. New mitigation would be required to ensure appropriate procedures and/or timing to reduce potential impacts.	**Increased.** Marine biological impacts would be greater because the new outfall pipeline would be located in MBNMS and entail disturbance of the seafloor and in-water work where the outfall pipeline emerges from subsurface and the diffuser was attached and anchored. Impacts on marine resources would be due to the physical disruption of the sediments and mortality of resident epifauna and infauna, increased turbidity from sediment resuspension and disruption of foraging by bottom-feeding fishes. The construction zone runs through sensitive habitat within approximately 0.5 mile of shore used by numerous surf perches, grunion, seabass, smelt and squid for spawning, mostly in the spring and summer months. New mitigation would be required to ensure appropriate procedures and/or timing to reduce potential impacts.	**Increased.** Marine biological impacts would be greater because of in-water work and disturbance of the seafloor needed to repair the existing outfall pipeline and to attach and anchor a new diffuser within MBNMS. Impacts on marine resources would be due to the physical disruption of the sediments and mortality of resident epifauna and infauna, increased turbidity associated with sediment resuspension, and disruption of foraging by bottom-feeding fishes. The construction zone runs through sensitive habitat within approximately 0.5 mile of shore used by numerous surf perches, grunion seabass, smelt and squid for spawning, mostly in the spring and summer months. New mitigation would be required to ensure appropriate procedures and/or timing to reduce potential impacts.	**Increased.** Marine biological impacts would be greater because the new outfall pipeline would be located in MBNMS and entail disturbance of the seafloor and in-water work where the outfall pipeline emerges from subsurface and the diffuser was attached and anchored. Impacts on marine resources would be due to the physical disruption of the sediments and mortality of resident epifauna and infauna, increased turbidity associated with sediment resuspension, and disruption of foraging by bottom-feeding fishes. The construction zone runs through sensitive habitat within approximately 0.5 mile of shore used by numerous surf perches, grunion, seabass, smelt and squid for spawning, mostly in the spring and summer months. New mitigation would be required to ensure appropriate procedures and/or timing to reduce potential impacts.	**Increased.** Marine biological impacts would be greater because of in-water work and disturbance of the ocean floor associated with attaching and anchoring a new diffuser within MBNMS. It is assumed a new diffuser would be required for brine discharge under this option due to anticipated reductions in the MLPP cooling water discharges. Impacts on marine resources would be due to the physical disruption of the sediments and mortality of resident epifauna and infauna, although turbidity would not be increased as much as for the other options because the outfall's nearshore location is very sandy without much fine material. Foraging by bottom-feeding fishes and sea otters could be disrupted in the disturbed area until biological communities recovered. The construction zone is within sensitive habitat within approximately 0.5 mile of shore used by numerous surf perches, grunion, seabass, smelt and squid for spawning, mostly in the spring and summer months. Being very near the mouth of Elkhorn Slough, construction activity at this site also has the potential of affecting the large group of sea otters that frequent the area west of the Highway 1 bridge. Controls on construction activities would be needed to avoid injuries to otters.	**Increased.** Marine biological impacts would be greater because the new outfall pipeline would be located in MBNMS and entail disturbance of the seafloor and in-water work where the outfall pipeline emerges from subsurface and the diffuser was attached and anchored. Impacts on marine resources would be due to the physical disruption of the sediments and mortality of resident epifauna and infauna, increased turbidity associated with sediment resuspension, and disruption of foraging by bottom-feeding fishes. New mitigation would be required to ensure appropriate procedures and/or timing to reduce potential impacts.
Operations and Facility Siting: Operation would have LSM impacts related to potential effects of candidate, sensitive, or special-status species; interference with the movement of any native resident or migratory fish or wildlife species; and conflict with adopted plans.	**Similar.** Impacts would be similar to the impacts of the proposed project, assuming a diffuser and operational controls are adequate to meet Ocean Plan Water Quality Objectives.	**Similar.** Impacts would be similar to the impacts of the proposed project, assuming a diffuser and operational controls are adequate to meet Ocean Plan Water Quality Objectives.	**Similar.** Impacts would be similar to the impacts of the proposed project, assuming a diffuser and operational controls are adequate to meet Ocean Plan Water Quality Objectives.	**Similar.** Impacts would be similar to the impacts of the proposed project, assuming a diffuser and operational controls are adequate to meet Ocean Plan Water Quality Objectives.	**Similar.** Impacts would be similar to the impacts of the proposed project, assuming a diffuser and operational controls are adequate to meet Ocean Plan Water Quality Objectives.	**Similar.** Impacts would be similar to the impacts of the proposed project, assuming a diffuser and operational controls are adequate to meet Ocean Plan Water Quality Objectives.	**Similar.** Impacts would be similar to the impacts of the proposed project, assuming a diffuser and operational controls are adequate to meet Ocean Plan Water Quality Objectives.

TABLE 5.3-5 (Continued)
OUTFALL OPTIONS EVALUATION – PRELIMINARY COMPARISON OF DIRECT ENVIRONMENTAL IMPACTS

Proposed Project: Existing MRWPCA Outfall Pipeline *(existing outfall)*	**Outfall Option 1: Modified MRWPCA Outfall and New Diffuser** *(new construction to MRWPCA plus modification of existing outfall)*	**Outfall Option 2: New Outfall at North CEMEX** *(new construction)*	**Outfall Option 3: New Outfall at Potrero Road** *(new construction)*	***Outfall Option 4: Modified National Refractories Outfall*** *(modifications to existing outfall, including repairs and new diffuser)*	**Outfall Option 5: New Outfall at Sandholdt Road** *(new construction)*	***Outfall Option 6: New Connection to Existing MLPP Cooling System Outfall CalAm #3***	***Outfall Option 7: New Outfall at Moss Landing [DeepWater Desal Outfall]*** *(new construction)*
4.6 TERRESTRIAL BIOLOGICAL RESOURCES							
<u>*Construction Activities:*</u> There would be NI on terrestrial biological resources.	**Similar.** Modification of the existing outfall would occur in the marine environment and would not be expected to impact terrestrial biological resources, which is similar to the proposed project.	**Increased.** Construction of a new outfall would occur within agricultural land behind the sand dunes. The construction area does not support federal wetlands, federal other waters, and /or waters of the State, riparian areas, critical habitat, or sensitive natural communities, so would have no impacts to these resources, which is similar to the proposed project. The outfall would have increased impacts on special-status species such as birds protected by the federal Migratory Bird Treaty Act. Similar to the proposed project, the intake would not conflict with local tree ordinances as there are no trees within the impact area, therefore NI.	**Increased.** Construction activities would avoid sensitive natural resources (by using jack and bore techniques under the slough), but construction would still occur adjacent to wetlands and sensitive natural communities associated with the slough and sand dunes and would have impacts on these biological resources as well as special-status species, such as western snowy plover, that could occur in this area. Similar to the proposed project, the outfall would not conflict with local tree ordinances as there are no trees within the impact area,	**Similar.** Modification of the existing outfall would occur in the marine environment and would not be expected to impact terrestrial biological resources, which is similar to the proposed project.	**Increased.** Impacts from all construction activities would occur in previously disturbed areas. Therefore, it is anticipated that there would not be direct impacts on wetlands or natural communities. However, construction would occur adjacent to central dune scrub and wetlands associated with the slough could be impacted by construction. Construction of the outfall would have impacts on candidate, sensitive, or special-status species; riparian habitat, critical habitat, or other sensitive natural communities; and federal wetlands, other federal waters, or waters of the State. Similar to the proposed project, the outfall would not conflict with local tree ordinances as there are no trees within the impact area,.	**Increased.** Impacts from all construction activities would occur in previously disturbed areas away from wetlands and sensitive natural communities. Therefore, it would not impact sensitive natural communities or wetlands. Few special-status species have potential to be impacted by this alternative, but there is potential for construction activities to impact special-status species such as birds protected by the federal Migratory Bird Treaty Act. Similar to the proposed project, the outfall would not conflict with local tree ordinances as there are no trees within the impact area,.	**Increased.** Impacts from all construction activities would occur in previously disturbed areas away from wetlands and sensitive natural communities. Therefore, it would not impact sensitive natural communities or wetlands. Few special-status species have potential to be impacted by this alternative, but there is potential for construction activities to impact special-status species such as birds protected by the federal Migratory Bird Treaty Act. Similar to the proposed project, the outfall would not conflict with local tree ordinances as there are no trees within the impact area.
<u>*Operations and Facility Siting:*</u> Use of the existing outfall structure would have NI on terrestrial biological resources.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.7 HAZARDS AND HAZARDOUS MATERIALS							
<u>*Construction Activities:*</u> There would be NI related to hazards or hazardous materials during construction.	**Increased.** Impacts would be increased because the construction could include the transport, use, and disposal of hazardous materials. All other impacts would be similar to those of the proposed project outfall.	**Increased.** Impacts would be increased because construction could include the transport, use, and disposal of hazardous materials. The potential for the release of hazardous materials into the environment would be greater. The risk of wildland fires would increase. All other impacts would be similar to those of the proposed project.	**Increased.** Impacts would be increased because construction could include the transport, use, and disposal of hazardous materials. The potential for the release of hazardous materials into the environment would be greater. The risk of wildland fires would be increase. All other impacts would be similar to those of the proposed project.	**Increased.** Impacts would be increased because repairs could include the transport, use, and disposal of hazardous materials. The potential for the release of hazardous materials into the environment would be greater. The risk of wildland fires would be increase. All other impacts would be similar to those of the proposed project.	**Increased.** Impacts would be increased because construction could include the transport, use, and disposal of hazardous materials. The potential for the release of hazardous materials into the environment would be greater. The risk of wildland fires would increase. All other impacts would be similar to those of the proposed project.	**Increased.** Impacts would be increased because construction could include the transport, use, and disposal of hazardous materials. The potential for the release of hazardous materials into the environment would be greater. The risk of wildland fires would increase. All other impacts would be similar to those of the proposed project.	**Increase.** Impacts would be increased because construction could include the transport, use, and disposal of hazardous materials. The potential for the release of hazardous materials into the environment would be greater. The risk of wildland fires would increase. All other impacts would be similar to those of the proposed project.
<u>*Operations and Facility Siting:*</u> There would be an LS impact associated with locating project facilities within an airport land use plan area and no other operational or siting impacts related to hazards or hazardous materials during construction.	**Similar.**	**Decreased.** This option would not be located in an airport land use plan area, therefore no impact would occur.	**Decreased**. This option would not be located in an airport land use plan area, therefore no impact would occur.	**Decreased**. This option would not be located in an airport land use plan area, therefore no impact would occur.	**Decreased** This option would not be located in an airport land use plan area, therefore no impact would occur.	**Decreased.** This option would not be located in an airport land use plan area, therefore no impact would occur.	**Decreased**. This option would not be located in an airport land use plan area, therefore no impact would occur.

TABLE 5.3-5 (Continued)
OUTFALL OPTIONS EVALUATION – PRELIMINARY COMPARISON OF DIRECT ENVIRONMENTAL IMPACTS

Proposed Project: Existing MRWPCA Outfall Pipeline *(existing outfall)*	**Outfall Option 1: Modified MRWPCA Outfall and New Diffuser** *(new construction to MRWPCA plus modification of existing outfall)*	**Outfall Option 2: New Outfall at North CEMEX** *(new construction)*	**Outfall Option 3: New Outfall at Potrero Road** *(new construction)*	***Outfall Option 4: Modified National Refractories Outfall*** *(modifications to existing outfall, including repairs and new diffuser)*	**Outfall Option 5: New Outfall at Sandholdt Road** *(new construction)*	***Outfall Option 6: New Connection to Existing MLPP Cooling System Outfall CalAm #3***	***Outfall Option 7: New Outfall at Moss Landing [DeepWater Desal Outfall]*** *(new construction)*
4.8 LAND USE, LAND USE PLANNING, AND RECREATION							
<u>Construction Activities:</u> There would be NI on land use, land use planning, and recreation.	**Similar.**	**Similar.**	**Increased.** Impacts would be increased because construction would require temporary closure of the beach parking lot, requiring mitigation measures.	**Similar.**	**Increased.** Impacts would be increased due to potential disruption at the State Beach which borders or is close to the southern border of the site.	**Similar.**	**Similar.**
<u>Operations and Facility Siting:</u> Operation would have NI related to consistency with applicable land use plans, policies, and regulations and compatibility with adjacent land uses.	**Similar.**	**Similar.**	**Increased**. Impacts would be increased because periodic maintenance could require access to the outfall from the construction area, which would temporarily displace some beach parking.	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.9 TRAFFIC AND TRANSPORTATION							
<u>Construction Activities:</u> Construction activities would have NI on traffic and transportation.	**Increased**. Impacts would be increased because this option would involve construction; therefore, there would be an increase in construction related vehicles and traffic. The increase of construction related vehicles could increase traffic delays; cause hazards or disruptions to vehicles, bicyclists or pedestrians; increase wear-and-tear on roadways; and, impaired emergency access. Implementation mitigation measures would be required.	**Increased.** Impacts would be increased because this option would involve construction; therefore, there would be an increase in construction related vehicles and traffic. The increase of construction related vehicles could increase traffic delays; cause hazards or disruptions to vehicles, bicyclists or pedestrians; increase wear-and-tear on roadways; and, impaired emergency access. Implementation mitigation measures would be required	**Increased.** Impacts would be increased because this option would involve construction; therefore, there would be an increase in construction related vehicles and traffic. The increase of construction related vehicles could increase traffic delays; cause hazards or disruptions to vehicles, bicyclists or pedestrians; increase wear-and-tear on roadways; and, impaired emergency access. Implementation of the mitigation measures would be required.	**Increased.** Impacts would be increased because this option would involve construction; therefore, there would be an increase in construction related vehicles and traffic. The increase of construction related vehicles could increase traffic delays; cause hazards or disruptions to vehicles, bicyclists or pedestrians; increase wear-and-tear on roadways; and, impaired emergency access. Implementation of mitigation measures would be required.	**Increased.** Impacts would be increased because this option would involve construction; therefore, there would be an increase in construction related vehicles and traffic. The increase of construction related vehicles could increase traffic delays; cause hazards or disruptions to vehicles, bicyclists or pedestrians; increase wear-and-tear on roadways; and, impaired emergency access. Implementation of mitigation measures would be required.	**Increased.** Impacts would be increased because this option would involve construction; therefore, there would be an increase in construction related vehicles and traffic. The increase of construction related vehicles could increase traffic delays; cause hazards or disruptions to vehicles, bicyclists or pedestrians; increase wear-and-tear on roadways; and, impaired emergency access. Implementation of mitigation measures would be required.	**Increased.** Impacts would be increased because this option would involve construction; therefore, there would be an increase in construction related vehicles and traffic. The increase of construction related vehicles could increase traffic delays; cause hazards or disruptions to vehicles, bicyclists or pedestrians; increase wear-and-tear on roadways; and, impaired emergency access. Implementation of mitigation measures would be required.
<u>Operations and Facility Siting:</u> Operation and maintenance would have an LS impact related to long-term traffic increases on regional and local roadways.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.10 AIR QUALITY							
<u>Construction Activities:</u> There would be no construction and NI on air quality.	**Increased**. Impacts would be increased because there would be construction associated emissions of criteria air pollutants greater than the proposed project. The impact related to the exposure of sensitive receptors to substantial pollutant concentrations or create objectionable odors would also be greater.	**Increased**. Impacts would be increased because there would be construction associated emissions of criteria air pollutants greater than the proposed project. The impact related to the exposure of sensitive receptors to substantial pollutant concentrations or create objectionable odors would also be greater.	**Increased**. Impacts would be increased because there would be construction associated emissions of criteria air pollutants greater than the proposed project. The impact related to the exposure of sensitive receptors to substantial pollutant concentrations or create objectionable odors would also be greater.	**Increased**. Impacts would be increased because there would be construction associated emissions of criteria air pollutants greater than the proposed project. The impact related to the exposure of sensitive receptors to substantial pollutant concentrations or create objectionable odors would also be greater.	**Increased**. Impacts would be increased to there would be construction associated emissions of criteria air pollutants greater than the proposed project. The impact related to the exposure of sensitive receptors to substantial pollutant concentrations or create objectionable odors would also be greater	**Increased**. Impacts would be increased because there would be construction associated emissions of criteria air pollutants greater than the proposed project. The impact related to the exposure of sensitive receptors to substantial pollutant concentrations or create objectionable odors would also be greater.	**Increased**. Impacts would be increased because there would be construction associated emissions of criteria air pollutants greater than the proposed project. The impact related to the exposure of sensitive receptors to substantial pollutant concentrations or create objectionable odors would also be greater.
<u>Operations and Facility Siting:</u> Operation would have NI related to increased emissions of criteria air pollutants and exposure of sensitive receptors to substantial pollutant concentrations.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**

TABLE 5.3-5 (Continued)
OUTFALL OPTIONS EVALUATION – PRELIMINARY COMPARISON OF DIRECT ENVIRONMENTAL IMPACTS

Proposed Project: Existing MRWPCA Outfall Pipeline *(existing outfall)*	**Outfall Option 1: Modified MRWPCA Outfall and New Diffuser** *(new construction to MRWPCA plus modification of existing outfall)*	**Outfall Option 2: New Outfall at North CEMEX** *(new construction)*	**Outfall Option 3: New Outfall at Potrero Road** *(new construction)*	***Outfall Option 4: Modified National Refractories Outfall*** *(modifications to existing outfall, including repairs and new diffuser)*	**Outfall Option 5: New Outfall at Sandholdt Road** *(new construction)*	***Outfall Option 6: New Connection to Existing MLPP Cooling System Outfall CalAm #3***	***Outfall Option 7: New Outfall at Moss Landing [DeepWater Desal Outfall]*** *(new construction)*
4.11 GREENHOUSE GASES							
Construction and Operations: There would be no construction- or operational-related impacts on GHG emissions; NI.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.12 NOISE AND VIBRATION							
Construction Activities: There would be NI related to noise and groundborne vibration.	**Increased.** Impacts would be greater due to the potential for construction to generate noise and groundborne vibration.	**Increased.** Impacts would be greater due to the potential for construction to generate noise and groundborne vibration.	**Increased.** Impacts would be greater due to the potential for construction to generate noise and groundborne vibration.	**Increased.** Impacts would be greater due to the potential for construction to generate noise and groundborne vibration.	**Increased.** Impacts would be greater due to the potential for construction to generate noise and groundborne vibration.	**Increased.** Impacts would be greater due to the potential for construction to generate noise and groundborne vibration.	**Increased.** Impacts would be greater due to the potential for construction to generate noise and groundborne vibration.
Operations and Facility Siting: Operation would have LS impacts related to a permanent increase in ambient noise levels and exposure of people to or generation of excessive operational noise levels.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.13 PUBLIC SERVICES AND UTILITIES							
Construction Activities: There would be NI related to disruption of or need to relocate local utilities during construction.	**Increased.** Impacts would be greater because inserting the interior pipeline could disrupt use of the outfall and would require mitigation measures.	**Increased.** Impacts would be greater because construction could result in the disruption or relocation existing subsurface utilities. This option could also adversely impact landfill capacity.	**Increased.** Impacts would be increased to greater construction could result in the disruption or relocation existing subsurface utilities. This option could also adversely impact landfill capacity.	**Increased.** Impacts would be greater because construction could result in the disruption or relocation existing subsurface utilities. This option could also adversely impact landfill capacity.	**Increased.** Impacts would be greater because construction could result in the disruption or relocation existing subsurface utilities. This option could also adversely impact landfill capacity.	**Increased.** Impacts would be greater because construction could result in the disruption or relocation existing subsurface utilities. This option could also adversely impact landfill capacity.	**Increased.** Impacts would be greater because construction could result in the disruption or relocation existing subsurface utilities. This option could also adversely impact landfill capacity.
Operations and Facility Siting: There would be NI related to the need for new or physically altered government facilities, LS impacts related to effects on landfill capacity or the need for new wastewater facilities, and an LSM impact related to increased corrosion of the outfall and diffuser.	**Increased.** This option could have greater impacts related to the capacity of the MRWPCA outfall because the interior pipeline might restrict wastewater flows. All other operational impacts would be similar to those of the proposed project outfall.	**Decreased.** This option would not impact the MRWPCA outfall and diffuser. All other operational impacts would be similar to those of the proposed project outfall.	**Decreased.** This option would not impact the MRWPCA outfall and diffuser. All other operational impacts would be similar to those of the proposed project outfall.	**Decreased.** This option would not impact the MRWPCA outfall and diffuser. All other operational impacts would be similar to those of the proposed project outfall.	**Decreased.** This option would not impact the MRWPCA outfall and diffuser. All other operational impacts would be similar to those of the proposed project outfall.	**Similar**. There would not impact the MRWPCA outfall and diffuser, but the brine would have similar impact related to increase corrosion in the existing outfall pipeline. All other operational impacts would be similar to those of the proposed project outfall.	**Decreased**. This option would not impact the MRWPCA outfall and diffuser. All other operational impacts would be similar to those of the proposed project outfall.
4.14 AESTHETICS							
Construction Activities: There would be NI from construction on aesthetics resources.	**Similar.**	**Increased.** Construction of the outfall would result in greater impacts on scenic resources and temporary sources of light and glare.	**Increased.** Construction of the outfall would result in greater impacts on scenic resources and temporary sources of light and glare.	**Similar.**	**Increased.** Construction of the outfall would result in greater impacts on scenic resources and temporary sources of light and glare.	**Increased.** Construction of the outfall would result in greater impacts on scenic resources and temporary sources of light and glare.	**Increased.** Construction of the outfall would result in greater impacts on scenic resources and temporary sources of light and glare.
Operations and Facility Siting: Operation would have NI on scenic resources.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**

TABLE 5.3-5 (Continued)
OUTFALL OPTIONS EVALUATION – PRELIMINARY COMPARISON OF DIRECT ENVIRONMENTAL IMPACTS

Proposed Project: Existing MRWPCA Outfall Pipeline *(existing outfall)*	**Outfall Option 1: Modified MRWPCA Outfall and New Diffuser** *(new construction to MRWPCA plus modification of existing outfall)*	**Outfall Option 2: New Outfall at North CEMEX** *(new construction)*	**Outfall Option 3: New Outfall at Potrero Road** *(new construction)*	***Outfall Option 4: Modified National Refractories Outfall*** *(modifications to existing outfall, including repairs and new diffuser)*	**Outfall Option 5: New Outfall at Sandholdt Road** *(new construction)*	***Outfall Option 6: New Connection to Existing MLPP Cooling System Outfall CalAm #3***	***Outfall Option 7: New Outfall at Moss Landing [DeepWater Desal Outfall]*** *(new construction)*
4.15 CULTURAL RESOURCES							
Construction, Operations and/or Facility Siting There would be NI on cultural resources.	**Similar.**	**Increased.** The potential to adversely effects archaeological resources, and human remains would be increased requiring mitigation. The impacts related to paleontological resources would also be greater.	**Increased.** The potential to adversely effects archaeological resources, and human remains would be increased requiring mitigation. The impacts related to paleontological resources would also be greater.	**Increased.** The potential to adversely effects archaeological resources, and human remains would be increased requiring mitigation. The impacts related to paleontological resources would also be greater.	**Increased.** The potential to adversely effects archaeological resources, and human remains would be increased requiring mitigation. The impacts related to paleontological resources would also be greater.	**Increased.** The potential to adversely effects archaeological resources, and human remains would be increased requiring mitigation. The impacts related to paleontological resources would also be greater.	**Increased.** The potential to adversely effects archaeological resources, and human remains would be increased requiring mitigation. The impacts related to paleontological resources would also be greater.
4.16 AGRICULTURE AND FOREST RESOURCES							
Construction, Operations, and/or Facility Siting: There would be NI on agricultural and forest resources.	**Similar.**	**Increased**. Impacts would be increased because construction could temporarily disrupt and displace Farmland of Statewide Importance, and could conflict with existing zoning for agricultural uses or Williamson Act contracts.	**Increased.** Impacts would be increased because construction could temporarily disrupt and displace Farmland of Statewide Importance, and could conflict with existing zoning for agricultural uses or Williamson Act contracts.	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.17 MINERAL RESOURCES							
Construction, Operations, and/or Facility Siting: There would be NI on mineral resources.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.18 ENERGY RESOURCES							
Construction Activities: There would be NI on energy resources.	**Increased.** Impacts would be increased because construction would require the use of fuel and/or energy.	**Increased.** Impacts would be increased because construction would require the use of fuel and/or energy.	**Increased.** Impacts would be increased because construction would require the use of fuel and/or energy.	**Increased.** Impacts would be increased because construction would require the use of fuel and/or energy.	**Increased.** Impacts would be increased because construction would require the use of fuel and/or energy.	**Increased.** Impacts would be increased because construction would require the use of fuel and/or energy.	**Increased.** Impacts would be increased because construction would require the use of fuel and/or energy.
Operations and Facility Siting: Operation would have LS impacts related to the use of large amounts of fuel and energy and constrains on the local or regional energy supplies.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**
4.19 POPULATION AND HOUSING							
Construction, Operations, and/or Facility Siting: Construction and operation would have an LS impact related to direct growth inducement.	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**	**Similar.**

TABLE 5.3-6
DESALINATION PLANT SITE OPTIONS EVALUATION – PRELIMINARY COMPARISON OF DIRECT ENVIRONMENTAL IMPACTS

Proposed Project: MPWSP Desalination Plant Site on Charles Benson Road *(new construction)*	**Desalination Plant Site Option 2: Moss Landing National Marine Refractories Site** *(new construction)*	**Desalination Plant Site Option 3: Moss Landing Power Plant East Tank Farm Parcel** *(new construction)*
4.2 GEOLOGY, SOILS, AND SEISMICITY		
Construction Activities: Construction would have LSM impact associated with the potential to increase soil erosion or loss of topsoil. *Operations, and Maintenance:* Operation and maintenance would have a LS impact as a result of the potential to expose people or structures to seismically-induced groundshaking, liquefaction, lateral spreading, and corrosive soils. There would be NI from the potential to expose people or structures to landslides, coastal retreat due to sea level rise, subsidence, expensive soil and soil disposal.	**Similar**	**Similar**
4.3 SURFACE WATER HYDROLOGY AND WATER QUALITY		
Construction Activities: Construction would have a LS impact related to the degradation of water quality associated with increased soil erosion, inadvertent releases of toxic chemicals, and a LSM impact from construction-related discharges of dewatering effluent from open excavations, and water produced during well drilling and development. *Operations and Maintenance:* The potential to violate water quality standards or waste discharge requirements or result in an adverse water quality effect as a result of brine discharges during project operation would be a LS impact. Operation and maintenance would have a LS impact from the alteration of drainage patterns in a way that would increase erosion, siltation, the amount of surface runoff, increase flooding on- or offsite, or exceed the capacity of the stormwater drainage systems. Furthermore, the potential to expose people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise would be LS. No impacts would result from the impeding or redirecting flood flows, or exposing people or structure to risk of loss, injury, or death from flooding due to a tsunami.	**Increased** – In addition to the impacts identified for the proposed project, this option could expose people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise and coastal flooding. Other impacts would be similar to the proposed project.	**Similar.**[18]
4.4 GROUNDWATER RESOURCES		
Construction Activities: Construction would not substantially deplete groundwater supplies, interfere substantially with groundwater recharge, nor would construction violate water quality standards or otherwise degrade water quality and there would be NI. *Operations and Maintenance:* For the reasons stated above, operation and maintenance would have NI on groundwater resources.	**Similar**	**Similar**
4.5 MARINE RESOURCES		
Construction, Operations and Maintenance: There would be no impact on Marine Resources as a result of construction or operations at desalination plant location at Charles Benson Road.	**Similar**	**Similar**
4.6 TERRESTRIAL BIOLOGICAL RESOURCES		
Construction Activities: Project-related construction activities would have LSM impacts related to the adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification; and conflict with local tree ordinances. *Operations and Maintenance:* Operations and maintenance would result in LSM impacts on species identified as candidate, sensitive, or special-status, either directly or through habitat modification and NI to riparian habitat, critical habitat, or other sensitive natural communities; federal wetlands, federal other waters, and/or waters of the State; or conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.	**Increased** - This desalination site option would likely have similar impacts on biological resources. However, two drainages may be considered jurisdictional features by the USACE, RWQCB and/or CCC. Therefore, this site option has an increased potential to adversely affect federally protected wetlands, federal "other waters", and Waters of the State and would require mitigation for impacts on wetlands or other waters. Operations would have similar impacts on special-status species and NI to wetlands or other waters; riparian habitat, critical habitat, or other sensitive natural communities; or conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.	**Increased** – This desalination option is located within non-native grassland and scrub habitat, which may be considered a sensitive natural community. Additionally, a potential wetland is located on the site. This desalination plant would have adverse environmental effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification; riparian habitat, critical habitat, or sensitive natural communities; federal wetlands, federal other waters, and/or waters of the State; and conflict with local tree ordinances. Operations of this desalination plant would have similar impacts on special-status species and no impacts on wetlands or other waters; riparian habitat, critical habitat, or other sensitive natural communities; or conflict with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

[18] The MBRWP plant site would be outside of both the tsunami inundation area and the 100-year flood zone. This has changed from an increased impact to a similar impact from the Draft EIR/EIS to the Final EIR/EIS, because analysis in the Draft EIR/EIS incorrectly stated that the MBRWP plant site would be within a tsunami inundation area and a 100-year flood zone.

TABLE 5.3-6 (Continued)
DESALINATION PLANT SITE OPTIONS EVALUATION – PRELIMINARY COMPARISON OF DIRECT ENVIRONMENTAL IMPACTS

Proposed Project: MPWSP Desalination Plant Site on Charles Benson Road *(new construction)*	**Desalination Plant Site Option 2: Moss Landing National Marine Refractories Site** *(new construction)*	**Desalination Plant Site Option 3: Moss Landing Power Plant East Tank Farm Parcel** *(new construction)*
4.7 HAZARDS AND HAZARDOUS MATERIALS		
Construction Activities: Construction would have an LS impact associated with the potential to create a hazard to the public through the routine transport, use and disposal of hazardous materials and an LSM impact associated with the potential to release hazardous materials to the environment. The increased risk of fire during construction would be an LS impact. There would be NI from siting the MPWSP Desalination Plant on a known hazardous materials site and no impact from hazardous materials handling or hazardous emissions within 0.25 mile of a school during construction. *Operations and Maintenance:* Compliance with applicable laws and regulations would ensure that periodic maintenance activities would have an LS impact associated with the transport, use, and disposal of hazardous materials. There would be NI from hazardous materials handling or hazardous emissions within 0.25 mile of a school during operation. The MPWSP Desalination Plant would be located within an airport land use plan area; therefore the impact would be LS.	**Similar**	**Similar**
4.8 LAND USE, LAND USE PLANNING, AND RECREATION		
Construction Activities: There are no parks or recreational facilities near the MPWSP Desalination Plant site; NI related to disruption or closure of recreational facilities. *Operations and Maintenance:* LS impact with respect to land use compatibility because the proposed project would not preclude continued use of other adjacent lands for grazing and other agricultural activities.	**Similar**	**Similar**
4.9 TRAFFIC AND TRANSPORTATION		
Construction Activities: Construction activities would have LSM impacts due to a temporary increase in traffic from construction workers and trucks traveling to and from the construction work areas and increases in traffic safety hazards due to potential conflicts between large construction vehicles and other vehicles, bicyclists, and pedestrians. Wear and tear on smaller haul route roadways caused by heavy trucks transporting equipment and material to and from construction work areas would be an LSM impact. Construction would have an LS impact on the capacity of roadways, emergency access and disruptions to public transportation, bicycle, and pedestrian facilities during construction. *Operations and Maintenance:* The impact of long-term traffic increases from the operation and maintenance activities would be LS.	**Similar**	**Similar**
4.10 AIR QUALITY		
Construction Activities: Emissions of criteria air pollutants and contribution to the violation of an ambient air quality standard during construction of the MPWSP Desalination Plant (and all other project components) would be LSM. The MPWSP Desalination Plant (and all other project components) potential to expose sensitive receptors to substantial pollutant concentrations or create objectionable odors affecting a substantial number of people during construction would be LS. *Operations and Maintenance:* Operation and maintenance would have LS impacts related to the increase of criteria pollutant emissions that could affect regional air quality and the potential to expose sensitive receptors to substantial pollutant concentrations or create objectionable odors affecting a substantial number of people during operations.	**Similar**	**Similar**

TABLE 5.3-6 (Continued)
DESALINATION PLANT SITE OPTIONS EVALUATION – PRELIMINARY COMPARISON OF DIRECT ENVIRONMENTAL IMPACTS

Proposed Project: MPWSP Desalination Plant Site on Charles Benson Road *(new construction)*	**Desalination Plant Site Option 2: Moss Landing National Marine Refractories Site** *(new construction)*	**Desalination Plant Site Option 3: Moss Landing Power Plant East Tank Farm Parcel** *(new construction)*
4.11 GREENHOUSE GASES		
Construction Activities: The contribution to climate change of GHG emissions from construction, in conjunction with other project construction, amortized over the 30 month construction period would have a LSM impact. *Operations and Maintenance:* The contribution to climate change of GHG emissions from operation and maintenance, in conjunction with other project operations would be LSM.	**Similar**	**Similar**
4.12 NOISE AND VIBRATION		
Construction Activities: Construction would have LS impacts due to a temporary increase in ambient noise level, exposure to construction noise levels in excess of standards established, and exposure to excessive groundborne vibration during construction. These impacts would be LS because construction noise and vibration levels would be below established thresholds and standards. *Operations and Maintenance:* For the reasons stated above operation and maintenance would have a LS impact as a result of noise and vibration.	**Similar**	**Increased** – Due to the site proximity to nearby residences to this desalination site option, construction at this location has an increased potential to violate established standards and expose sensitive receptors to increase vibrations. Furthermore, operation of a desalination plant on this site would likely violate established standards set by Monterey County and could require mitigation.
4.13 PUBLIC SERVICES AND UTILITIES		
Construction Activities: Project-related construction activities would have LSM impacts due to the disruption or relocation of regional or local utilities and the potential to exceed landfill capacity or be out of compliance with federal, state, and local statutes and regulations related to solid waste. Construction would not result in the need for new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for any public services, therefore NI would occur. *Operations and Maintenance:* Operation and maintenance would have an LS impact related to the potential to exceed landfill capacity or be out of compliance with federal, state, and local statutes and regulations related to solid waste. Impacts would be LSM as the MPWSP Desalination Plant could result exceed wastewater treatment requirements of the Central Coast RWQCB. There would be no need for new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for any public services, therefore no impact would occur.	**Similar**	**Similar**
4.14 AESTHETICS		
Construction Activities: Construction would have an LS impact on scenic resources, visual character or light and glare, as there are no designated scenic roadways or scenic viewpoints from which the construction activities would be visible from and the MPWSP Desalination Plant would be constructed near similar types of industrial development. Furthermore, there are no nearby residences that could be affected by lighting. *Operations and Maintenance:* For the reasons stated above, operation and maintenance would have an LS impact on aesthetics resources.	**Similar**	**Increased** – This desalination site option would be located within 500 feet of nearby residences, which could be affected by night time lighting and would require mitigation to reduce impacts. Other impacts would be similar to the proposed project.
4.15 CULTURAL RESOURCES		
Construction Activities: No historical resources eligible for listing in the CRHR or historic properties eligible for listing in the NRHP are located within the indirect APE for the MPWSP Desalination Plant. Therefore, there would be NI on historical resources from construction. The potential inadvertent discovery of human remains is considered an LSM impact. Construction would result in an LS impact related to the direct or indirect destruction of a unique paleontological resource or site, or unique geologic feature during construction.	**Similar**	**Similar**

TABLE 5.3-6 (Continued)
DESALINATION PLANT SITE OPTIONS EVALUATION – PRELIMINARY COMPARISON OF DIRECT ENVIRONMENTAL IMPACTS

Proposed Project: MPWSP Desalination Plant Site on Charles Benson Road *(new construction)*	**Desalination Plant Site Option 2: Moss Landing National Marine Refractories Site** *(new construction)*	**Desalination Plant Site Option 3: Moss Landing Power Plant East Tank Farm Parcel** *(new construction)*
4.16 AGRICULTURE AND FOREST RESOURCES		
Construction Activities: Construction would have NI related to conversion of important farmland, conflicts with agricultural zoning or land with Williamson Act contracts, or otherwise change the existing environment in a way that would result in the conversion of farmland to non-agricultural use because the MPWSP Desalination Plant would not be located in an area mapped as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance; on land under Williamson Act contract. *Operations and Maintenance:* For the reasons stated above operation and maintenance would have NI on agricultural resources.	**Similar**	**Similar**
4.17 MINERAL RESOURCES		
Construction Activities: There is no active mining in the immediate vicinity of the MPWSP Desalination Plant. The MPWSP Desalination Plant would be constructed in an area designated as MRZ-2. Development on the site could limit the future recovery of mineral resources beneath the plant footprint. Therefore, impacts would be LS. *Operations and Maintenance:* For the reasons stated above operation and maintenance would have a LS impact.	**Similar**	**Similar**
4.18 ENERGY CONSERVATION		
Construction Activities: Construction of the MPWSP Desalination Plant (and all other project components) would require the use of fuels and electricity, as well as indirect energy use associated with the production of construction materials. The potential for project construction to use large amounts of fuel or energy in a wasteful manner would be a LSM. *Operations and Maintenance:* While operation and maintenance would use fossil fuels and electricity, the use of such energy would not be unnecessary, wasteful or inefficient; therefore, the impact of fuel and energy use would be LS. Impacts of operation, in conjunction with other components, on local or regional energy supplies or the need for expanded generation or transmission facilities would also be LS.	**Similar**	**Similar**
4.19 POPULATION AND HOUSING		
Construction Activities: Construction of the MPWSP Desalination Plant (and all other project components) would require up to 400 construction workers. The potential for project construction to induce substantial population growth as a result of construction would be LS as proposed project would not create employment opportunities substantially greater than would normally be available to construction workers in the area. *Operations and Maintenance:* During operation and maintenance, it is assumed that approximately 25 to 30 facility operators and support personnel would operate the MPWSP Desalination Plant. This incremental increase would not induce population growth in the region; therefore the direct growth-inducing impact of the project would be LS.	**Similar**	**Similar**

Intake Option 9 (DeepWater Desal) would have fewer operational impacts than the other open water intakes because of its proposed location and design: studies conducted by DeepWater Desal suggest the abundance of marine species is reduced at this deep water location. When compared to the other open-water intakes evaluated, Intake Option 9 could have fewer impacts from impingement and entrainment than the other open water intakes considered but increased construction impacts when compared to Option 8. Construction impacts are more easily mitigated than the operational impacts from impingement and entrainment; therefore, Intake Option 9 was carried forward into the development of whole alternatives (Alternative 2 in Section 5.4).

A summary of the intake options comparison table is presented below in **Table 5.3-7**.

TABLE 5.3-7
SUMMARY OF INTAKE OPTIONS COMPARISON TABLE

	Intake Option 2	Intake Option 3	Intake Option 4	Intake Option 6	Intake Option 8	Intake Option 9	Intake Option 13
4.2 Geology, Soils, and Seismicity							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	↓	↓	↓	↑	↓	↓	=
4.3 Surface Water Hydrology and Water Quality							
Construction Activities	↑	=	↑	↑	=	↑	=
Operations and Facility Siting	=	↑	=	=	=	↓	=
4.4 Groundwater Resources							
Construction Activities	↓	=	↓	↓	↓	↓	=
Operations and Facility Siting	↓	↑	↓	↓	↓	↓	=
4.5 Marine Biological Resources							
Construction Activities	↑	=	↑	↑	↑	↑	=
Operations and Facility Siting	↑	=	↑	↑	↑	↑	=
4.6 Terrestrial Biological Resources							
Construction Activities	↓	↓	↓	↓	↓	↑	=
Operations and Facility Siting	↓	=	↓	↓	↓	↓	=
4.7 Hazards and Hazardous Materials							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=
4.8 Land Use, Land Use Planning, and Recreation							
Construction Activities	=	↑	↑	=	↑	↑	=
Operations and Facility Siting	=	↑	↑	=	↑	↑	=
4.9 Traffic and Transportation							
Construction Activities	=	↑	↑	↓	↓	↓	=

TABLE 5.3-7 (Continued)
SUMMARY OF INTAKE OPTIONS COMPARISON TABLE

	Intake Option 2	Intake Option 3	Intake Option 4	Intake Option 6	Intake Option 8	Intake Option 9	Intake Option 13
4.10 Air Quality							
Construction Activities	↓	=	=	=	=	↓	=
Operations and Facility Siting	=	=	=	=	=	=	=
4.11 Greenhouse Gases							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=
4.12 Noise and Vibration							
Construction Activities	=	↑	↑	↓	↓	↓	=
Operations and Facility Siting	=	↑	↑	↓	↓	↓	=
4.13 Public Services and Utilities							
Construction Activities	=	=	=	↓	=	=	=
Operations and Facility Siting	=	=	=	↓	=	=	=
4.14 Aesthetics							
Construction Activities	↑	=	=	↑	=	=	=
Operations and Facility Siting	↑	=	=	↑	=	=	=
4.15 Cultural Resources							
Construction Activities	↓	↓	↓	↓	↓	↓	=
4.16 Agriculture and Forest Resources							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=
4.17 Mineral Resources							
Construction Activities	↓	↓	↓	↓	↓	↓	=
Operations and Facility Siting	↓	↓	↓	↓	↓	↓	=
4.18 Energy Resources							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=
4.19 Population and Housing							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=

↑ Increased impact ↓ Decreased impact = Similar impact

Outfall Options

The only outfall option not requiring new construction in MBNMS or any physical modification is the proposed project's use of the existing MRWPCA outfall. All other outfall options would require additional pipelines, modification of an existing outfall, new construction on the ocean floor in MBNMS, or both. As a result, outfall options 1 through 7 would result in increased adverse environmental effects during construction compared with the proposed use of the existing outfall. However, some outfall options demonstrated reduced impacts for certain environmental topic areas during operation or as a result of facility siting, including:

- **Hazards and Hazardous Materials** – Outfall options 2 through 7, unlike the proposed use of the existing outfall, would result in greater impacts, although the facilities would not be located within an airport land use plan area.
- **Public Services and Utilities** – Outfall options 2, 3, 4, 5, and 7 would result in reduced impacts related to increased corrosion of the existing wastewater outfall and diffuser compared with the proposed use of the existing outfall.

All seven of the outfall options would result in increased construction impacts, including new impacts in the marine environment, compared to the proposed project, and would not avoid or minimize potential environmental impacts, other than those noted above. Therefore, only the proposed use of the existing outfall was carried forward in the development of the "whole" alternatives because other options would not meet the Federal purpose and need to minimize impacts and are not likely to meet regulatory requirements.

A summary of the outfall options comparison table is presented below in **Table 5.3-8**.

Desalination Plant Site Options

Two alternative desalination plant sites were compared to the proposed desalination plant site at Charles Benson Road. These included Option 2: Moss Landing National Marine Refractories site (which is the site proposed as part of the People's Moss Landing Project), and Option 3: Moss Landing Power Plant East Tank Farm Parcel (which is the site proposed as part of the DeepWater Desal Project). The comparative analysis presented in Table 5.3-6 determined the following for each of the desalination site options:

- **Option 2**: The National Marine Refractories Site would have a similar level of environmental effects for most of the environmental topic areas compared to the proposed site at Charles Benson Road, but would result in increased impacts on surface water hydrology (it is located in the 100-year flood zone) and terrestrial biology.
- **Option 3**: The East Tank Farm Parcel would have a similar level of environmental effects for most of the environmental topic areas compared to the proposed site at Charles Benson Road, but would result in increased impacts on terrestrial biology, noise and vibration, and aesthetics.

TABLE 5.3-8
SUMMARY OF OUTFALL OPTIONS COMPARISON TABLE

	Outfall Option 1	Outfall Option 2	Outfall Option 3	Outfall Option 4	Outfall Option 5	Outfall Option 6	Outfall Option 7
4.2 Geology, Soils, and Seismicity							
Construction Activities	=	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	=	↑	↑	↑	↑	↑	↑
4.3 Surface Water Hydrology and Water Quality							
Construction Activities	↑	↑	↑	↑	↑	=	↑
Operations and Facility Siting	=	↑	↑	↑	↑	↑	↑
4.4 Groundwater Resources							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=
4.5 Marine Biological Resources							
Construction Activities	↑	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	=	=	=	=	=	=	=
4.6 Terrestrial Biological Resources							
Construction Activities	=	↑	↑	=	↑	↑	↑
Operations and Facility Siting	=	=	=	=	=	=	=
4.7 Hazards and Hazardous Materials							
Construction Activities	↑	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	=	↓	↓	↓	↓	↓	↓
4.8 Land Use, Land Use Planning, and Recreation							
Construction Activities	=	=	↑	=	↑	=	=
Operations and Facility Siting	=	=	↑	=	↑	=	=
4.9 Traffic and Transportation							
Construction Activities	↑	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	=	=	=	=	=	=	=
4.10 Air Quality							
Construction Activities	↑	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	=	=	=	=	=	=	=

TABLE 5.3-8 (Continued)
SUMMARY OF OUTFALL OPTIONS COMPARISON TABLE

	Outfall Option 1	Outfall Option 2	Outfall Option 3	Outfall Option 4	Outfall Option 5	Outfall Option 6	Outfall Option 7
4.11 Greenhouse Gases							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=
4.12 Noise and Vibration							
Construction Activities	↑	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	=	=	=	=	=	=	=
4.13 Public Services and Utilities							
Construction Activities	↑	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	↑	↓	↓	↓	↓	=	↓
4.14 Aesthetics							
Construction Activities	=	↑	↑	=	↑	↑	↑
Operations and Facility Siting	=	=	=	=	=	=	=
4.15 Cultural Resources							
Construction Activities	=	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	=	↑	↑	=	=	=	=
4.16 Agriculture and Forest Resources							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	↑	↑	=	=	=	=
4.17 Mineral Resources							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=
4.18 Energy Resources							
Construction Activities	↑	↑	↑	↑	↑	↑	↑
Operations and Facility Siting	=	=	=	=	=	=	=
4.19 Population and Housing							
Construction Activities	=	=	=	=	=	=	=
Operations and Facility Siting	=	=	=	=	=	=	=

↑ Increased impact ↓ Decreased impact = Similar impact

Overall, there are no potential impacts associated with developing the Charles Benson Road desalination plant site that would be avoided or minimized by using either of the other options. For this reason, and because CalAm already owns the property, only the Charles Benson Road site was carried forward into the development of whole alternatives.

A summary of the desalination plant site options comparison table is presented below in **Table 5.3-9**.

TABLE 5.3-9
SUMMARY OF DESALINATION PLANT SITE OPTIONS COMPARISON TABLE

	Desalination Plant Site Option 2	Desalination Plant Site Option 3
4.2 Geology, Soils, and Seismicity		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.3 Surface Water Hydrology and Water Quality		
Construction Activities	↑	=
Operations and Facility Siting	↑	=
4.4 Groundwater Resources		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.5 Marine Biological Resources		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.6 Terrestrial Biological Resources		
Construction Activities	↑	↑
Operations and Facility Siting	↑	↑
4.7 Hazards and Hazardous Materials		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.8 Land Use, Land Use Planning, and Recreation		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.9 Traffic and Transportation		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.10 Air Quality		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.11 Greenhouse Gases		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.12 Noise and Vibration		
Construction Activities	=	↑
Operations and Facility Siting	=	↑

TABLE 5.3-9 (Continued)
SUMMARY OF DESALINATION PLANT SITE OPTIONS COMPARISON TABLE

	Desalination Plant Site Option 2	Desalination Plant Site Option 3
4.13 Public Services and Utilities		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.14 Aesthetics		
Construction Activities	=	↑
Operations and Facility Siting	=	↑
4.15 Cultural Resources		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.16 Agriculture and Forest Resources		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.17 Mineral Resources		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.18 Energy Resources		
Construction Activities	=	=
Operations and Facility Siting	=	=
4.19 Population and Housing		
Construction Activities	=	=
Operations and Facility Siting	=	=

↑ Increased impact ↓ Decreased impact = Similar impact

Summary of Component Option Evaluation Conclusions

Of the seven intake options evaluated, for reasons described previously and in Table 5.3-4, two intake options were carried forward into the development of whole alternatives for full EIR/EIS analysis-- Option 3, Slant Wells at Potrero Road, and Option 9, Open-water Intake at Moss Landing. Because all of the outfall options evaluated would have greater construction-related impacts (Table 5.3-5) in MBNMS than the proposed project, which would use the existing MRWPCA outfall without modification, only the existing MRWPCA outfall was carried forward into the development of whole alternatives. The proposed Charles Benson Road desalination plant site was also carried forward since neither of the other options offers any advantage to, and would not reduce any significant impacts of, the proposed project.

Based on the conclusions of the component evaluations, the intake, desalination plant site, and outfall options were combined into whole alternatives for detailed consideration. They are fully described in Section 5.4 and evaluated in Section 5.5. Alternative 1 would utilize slant wells at Potrero Road (Intake Option 3) and Alternative 2 would utilize an open-water intake at Moss Landing (Intake Option 9). Both alternatives would use the Charles Benson Road desalination plant site and the existing MRWPCA outfall. The components of the DeepWater Desal alternative and the People's Project alternative were included and evaluated in the components screening process; the DeepWater Desal and the People's Project, as well as two reduced sized alternatives are also described in Section 5.4 and are evaluated in Section 5.5.

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5.4 Description of Alternatives Evaluated in Detail

5.4.1 Overview

This section describes the alternatives to the proposed project that are evaluated in detail in Section 5.5 and 5.6 of this EIR/EIS, including the "no project/no action" alternative. A description of the CEQA and NEPA guidelines related to alternatives evaluations is included in Section 5.1.1.

Consistent with the CEQA Guidelines, the analysis considers the ability of the alternatives to meet all or most of the basic project objectives. Consistent with NEPA guidance, the analysis considers the ability of alternatives to meet the project purpose and need. **Table 5.4-1** below provides an overview of the alternatives evaluated in detail.

The following sections describe each of the alternatives evaluated in detail organized in the following primary categories:

- Overview
- Construction Phase
- Operation and Maintenance Phase
- Ability to Meet Project Objectives / Purpose and Need

Each alternative is described by its primary components including: water intake, brine discharge, desalination plant, and product water conveyance facilities.

TABLE 5.4-1
OVERVIEW OF ALTERNATIVES EVALUATED IN DETAIL

	Components				
Alternative	**Intake Facilities**	**Brine Discharge/ Outfall Discharge Facilities**	**Desalination Plant**	**Conveyance Pipelines**	**Groundwater Replenishment Project Water Purchase Agreement**
Proposed Project *Described in Chapter 3*	9 new subsurface slant wells at CEMEX and conversion of test slant well to production well (10 total wells) Intake capacity of 24.1 mgd	• Brine Disposal Pipeline and Brine Mixing Box • Existing MRWPCA ocean outfall pipeline and diffuser • Ocean Outfall End Gate Modification	New 9.6 mgd desalination plant on 25 acres at Charles Benson Rd. site	Source Water pipeline, Brine Discharge pipeline, Castroville pipeline, Pipeline to Castroville Seawater Intrusion Project (CSIP) Pond, new Desalinated Water Pipeline, new Transmission Main, ASR facilities, and Highway 68 interconnection improvements. Approximately 21 total miles of pipelines.	Not part of proposed project
No Project Alternative *Described in Section 5.4.2*	No new facilities would be constructed; payback to the Seaside Groundwater Basin would not occur; reliance on existing and planned water conservation and recycling programs; likely implementation of mandatory rationing and conservation measures.				CalAm would purchase and extract 3,500 afy of GWR water from the Seaside Groundwater Basin
Alternative 1 – *Slant Wells at Potrero Road* *Described in Section 5.4.3*	10 new subsurface slant wells at Potrero Rd. Existing test slant well at CEMEX removed Same intake capacity (24.1 mgd) as proposed project.	Same as proposed project		Same as proposed project, plus a new source water pipeline between intake and desal plant that adds additional 5.5 miles of source water pipeline. Approximately 26 total miles of pipelines.	Not part of alternative
Alternative 2 – *Open-Water Intake at Moss Landing* *Described in Section 5.4.4*	New Screened Open-Water Intake at Moss Landing – one 36” diameter intake pipeline (HDD[1] installation) Existing test slant well at CEMEX removed Same intake capacity (24.1 mgd) as proposed project.			Source Water pipeline, Brine Discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR facilities, and Highway 68 interconnection improvements, plus an additional 6.5 miles of source water pipeline. Approximately 27 total miles of pipelines.	
Alternative 3 – *Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)* *Described in Section 5.4.5*	New Screened Open-Water Intake at Moss Landing – same location as Alt. 2; • two 42” diameter intake pipelines (HDD installation) and • a 110’ L x 30’ W x 12’ tall intake structure Existing test slant well at CEMEX removed Larger intake capacity (49 mgd) than proposed project	New Outfall at Moss Landing; • two 36” diameter discharge pipelines (HDD installation) and • a 140’L x 10’ W x 15’ tall discharge structure	New 22 mgd desalination plant and co-located data center at 110-acre “East Tank Farm Parcel” off Dolan Road, Moss Landing	New Desalinated Water Pipeline, new Transmission Main, ASR facilities, and Highway 68 interconnection improvements, plus an 8 mi source water pipeline, transfer and brine discharge pipelines, and two new pipelines to serve other areas (Salinas and Santa Cruz Co; approximately 25 miles). Approximately 48 total miles of pipelines.	Not part of alternative

TABLE 5.4-1 (Continued)
OVERVIEW OF ALTERNATIVES EVALUATED IN DETAIL

Alternative	Components				
	Intake Facilities	**Brine Discharge/ Outfall Discharge Facilities**	**Desalination Plant**	**Conveyance Pipelines**	**Groundwater Replenishment Project Water Purchase Agreement**
Alternative 4 – *People's Moss Landing Water Desalination Project (People's Project)* *Described in Section 5.4.6*	New Screened Open-Water Intake at Moss Landing – same general location as Alt. 2, but different installation ● 40" diameter pipeline, combination HDD and laid on seafloor (for 1,100') ● two 96" diameter screened intakes Existing test slant well at CEMEX removed Larger intake capacity (approx. 30 mgd) than proposed project	New Outfall at Moss Landing; extension of existing outfall ● 36" diameter pipeline, combination HDD and laid on seafloor (for 700') ● two 16" diameter diffuser ports	New 12 mgd desalination plant at former National Refractories facility in Moss Landing	New Desalinated Water Pipeline, new Transmission Main, ASR facilities, and Highway 68 interconnection improvements, plus an alternative 8-mile-long source water pipeline. Approximately 20 total miles of pipelines.	Not part of alternative
Alternative 5a[2] – *Reduced Project 6.4-mgd Desalination Plant (Intake Slant Wells at CEMEX)* *Described in Section 5.4.7*	Same as proposed project, but fewer slant wells (7) at CEMEX Smaller intake capacity (15.5 mgd) than proposed project	Same as proposed project except there would be less brine discharged.	New 6.4 mgd desalination plant at Charles Benson Rd site.	Same as proposed project, approximately 21 total miles of pipelines.	CalAm's purchase and extraction 3,500 afy of GWR water from the Seaside Groundwater Basin is considered in the cumulative analysis
Alternative 5b – *Reduced Project 6.4-mgd Desalination Plant (Intake Slant Wells at Potrero Road)* *Described in Section 5.4.8*	Same as Alternative 1, but fewer slant wells (7) at Potrero Road Existing test slant well at CEMEX removed Smaller intake capacity (15.5 mgd) than proposed project			Same as proposed project, plus an additional 5.5 miles of source water pipeline, approximately 26 miles of pipelines.	

NOTES:
1 Horizontal Directional Drilling (HDD) is described in Section 3.3.4.3 in Chapter 3, Description of the Proposed Project
2 Alternative 5 includes a reduced size desalination plant. The CPUC authorized CalAm to enter into a water purchase agreement for 3,500 afy from the GWR Project, and to build the new Monterey Pipeline and associated pump station needed for the GWR project, in September 2016. As a result, the GWR project is a reasonably foreseeable future project, and the cumulative impact scenario evaluated for Alternatives 5a and 5b includes implementation of the GWR project. The GWR project is not considered for cumulative impacts in conjunction with the proposed project or Alternatives 1, 2, or 4 because if a desalination option is selected that is of a size sufficient to fully satisfy the project objectives in terms of water supply, such choice would presumably mean that the GWR project was not successful in securing funding, completing construction and undertaking operations. The GWR project is conservatively considered for cumulative impacts with Alternative 3 because under that option, CalAm could meet its full project water supply objectives via the DeepWater Desal project, or could obtain water from a combination of the DeepWater Desal project and the GWR Project. See Table 4.1-2 in Section 4.1.

5.4.1.1 Alternatives Development

This EIR/EIS examines three types of action alternatives: alternatives to the CalAm proposed project; reduced capacity alternatives, and desalination projects proposed by other entities.

First, the EIR/EIS analyzes alternatives to CalAm's proposed MPWSP. In Section 5.3, the action Alternative 1 (Slant Wells at Potrero Road) and Alternative 2 (Open-Water Intake at Moss Landing) were identified by screening alternative desalination plant components – water intake, brine discharge outfalls, and desalination sites. Components that are considered to be the least environmentally damaging are then combined into "whole" alternatives in Section 5.4.

Second, the action alternatives include two reduced capacity alternative scenarios. As explained in Chapter 1, CalAm's application includes two capacity options or build-out scenarios. The first option, the "Proposed Project," is designed to meet the full project objectives for water supply. The second option (Alternative 5) would meet the project objectives by combining a reduced-capacity desalination plant (6.4 mgd) with a water purchase agreement for 3,500 acre-feet per year (afy) of advanced treated water from another source, the Pure Water Monterey Groundwater Replenishment (GWR) project. Two variations of the reduced capacity alternatives (5a and 5b) are provided based on alternative locations for the slant well intakes (CEMEX or Potrero Road).

Third, the EIR/EIS identifies two other desalination projects proposed by project proponents other than CalAm, that would provide water service to the CalAm Monterey District Service Area. The first project is the Monterey Bay Regional Water Project, also known as Deepwater Desal (Alternative 3); and the second is the People's Moss Landing Desalination Project (Alternative 4). Both projects at are different stages in development, and the project descriptions contained in this EIR/EIS are based on available information about the projects. These projects will be the subject of their own, separate, CEQA and NEPA processes.

5.4.2 No Project Alternative

Both CEQA and NEPA require that an EIR/EIS consider and analyze a "no project" or "no action" alternative. CEQA Guidelines Section 15126.6(e) provides the following guidance on the "no project" alternative:

- An EIR shall consider the specific alternative of "no project" and evaluate its impacts to allow decision-makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project.
- The no project analysis shall discuss the existing conditions at the time the Notice of Preparation was published as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure.
- If the proposed project is a development project on identifiable property, the no project alternative is the circumstance under which the project does not proceed.

As described in the subsections below, the No Project Alternative reflects the scenario in which neither the proposed project nor Alternatives 1 through 5, described in Sections 5.4.3 through 5.4.8, would proceed.

Additionally, CEQ NEPA regulations at 40 CFR 1502.14 state that the alternatives analysis shall include an alternative of taking no action. In the case of the federal agency action, “no action” would mean that MBNMS would not authorize those portions of the proposed project or alternatives that would occur in the sanctuary. Where a choice of “no action” by the agency would result in predictable actions by others, this consequence of the “no action” alternative should be included in the analysis. Without MBNMS authorization, the proposed project and alternatives could not take place. Therefore, for purposes of this EIR/EIS, the CEQA No Project Alternative and the NEPA No Action Alternative are the same.

5.4.2.1 Overview

Under the No Project Alternative, the CPUC would not issue a CPCN for the MPWSP or another alternative; MBNMS would not issue authorizations or a special use permit for the components of the project within MBNMS, and no facilities would be constructed. CalAm would continue to operate its Monterey District facilities in compliance with the 2009 SWRCB Cease and Desist Order (CDO) as amended by SWRCB Order WR 2016-0016 (together referred to herein as the Revised CDO, described in more detail below) and the Seaside Groundwater Basin Adjudication.[1] Under the No Project Alternative, at the end of the Revised CDO extension period, CalAm would have an estimated 6,380 afy of potable water available for delivery within its service area from existing sources. The components of the No Project Alternative (i.e., changes compared to baseline conditions) that are the basis for analysis of its impacts in this EIR/EIS are as follows:

- Reduction in total water supply available to serve CalAm’s Monterey District. CalAm’s current supply is approximately 11,840 afy, and total long-term supply under the No Project Alternative would be 6,380 afy.[2]
- Between 2018 and 2021, curtailed diversion limits from the Carmel River system of 7,310 to 4,310 afy compared to current rate of pumping (8,310 afy);
- Reduction in pumping from Seaside Groundwater Basin from current operating yield of 2,200 afy to a safe yield of 1,474 afy; and
- Implementation of Revised CDO Stage 3 Conservation Measures and Stage 4 Rationing.

1 The April 2015 MPWSP DEIR included two No Project Alternatives: No Project A was consistent with the CDO at the time; No Action B included an extension of the CDO timeframe. The No Project alternative in this EIR/EIS is consistent with the Revised CDO.

2 This estimate assumes a long term average supply of 1,300 afy from aquifer storage and recovery and that 230 afy would be available from the Sand City desalination plant, in addition to 3,376 afy from the Carmel River and 1,474 afy from the Seaside Groundwater Basin. Less water will be available from Sand City in the longer term; CalAm’s supply from the Sand City desalination plant will eventually be reduced to 94 afy, although more is available until Sand City needs it for its own development. As under the MPWSP, the amount that would be available from aquifer storage and recovery could vary year to year depending on rainfall and river levels; less supply could be available at the end of 2021 if there are dry years between now and then.

Additionally, the analysis of the No Project Alternative considers the following differences compared to the proposed project; however, these are not considered direct or indirect impacts of the No Project Alternative because they do not represent a change from baseline conditions; rather, they represent avoided impacts or benefits not realized, and are discussed for purposes of comparison:

- No construction;
- No increase in total water supply to the estimated 16,430 afy with the proposed project;
- Between 2018 and 2022, 10,000 total fewer acre-feet of water diverted from Carmel River to customers;
- No increase in the Aquifer Storage and Recovery Project (ASR) reliable yield from 1,300;
- Continuation of moratorium on new water permit applications; and
- No “payback” to the Seaside Groundwater Basin.

A comparison of the components of the No Project Alternative to existing conditions and to the proposed project is provided in **Table 5.4-2**. These components are described in more detail in Sections 5.4.2.2 and 5.4.2.3.

TABLE 5.4-2
COMPARISON OF THE NO PROJECT ALTERNATIVE
TO EXISTING CONDITIONS AND THE PROPOSED PROJECT

Existing Conditions	Proposed Project	No Project Alternative
Construction		
n/a	Construction of MPWSP components as described in Chapter 3	No new construction; decommissioning of the test slant well
Operations		
8,310 afy diverted from Carmel River system	8,310 afy diverted until January 2022; 3,376 afy thereafter	8,310 afy reducing by 1,000 afy per year from 2018 to 2022; 3,376 afy thereafter Total of 10,000 af less water diverted from river between 2018 and 2021 compared to proposed project
Pumping of 2,200 afy from Seaside Basin	Pumping of 774 afy from Seaside Basin for 25 years; 1,474 afy thereafter 17,500 af payback to basin over 25 years	Pumping from Seaside Basin reducing to 1,474 afy by 2021 No payback
ASR reliable yield of 1,300 afy	Increased ASR injection capacity and long-term reliability	No increase in ASR injection capacity or long-term reliability *
Moratorium on new water service connections	Moratorium lifted	Moratorium continued
Stage 1 and 2 Conservation Measures in place	Stage 1 Conservation Measures continued Stage 2 Conservation Measures may sunset when conditions met	Stage 1 and 2 Conservation Measures continued Stage 3 Conservation Measures and Stage 4 Rationing implemented

NOTES:
* The separate Monterey Pipeline and Pump Station project, described as project No. 60 in Table 4.1-2 in Section 4.1, would increase the ability to convey ASR water to approximately 1,600 afy when completed. This is not a component of the No Project Alternative, but is considered a project in the cumulative scenario relevant to this alternative.

5.4.2.2 Construction

Under the No Project Alternative CalAm would not build any MPWSP facilities. Therefore, none of the construction described for the proposed project in Section 3.3 of Chapter 3, Description of the Proposed Project, would occur. However, the test slant well, currently permitted to operate intermittently until February 2019, would be decommissioned as described in Section 4.2.5 (Secondary Impacts of Mitigation Measure 4.2-10).

5.4.2.3 Operation and Maintenance

Under the No Project Alternative, the concept of "operation and maintenance" refers to CalAm's ongoing operation of its Monterey District water supply and distribution system with the water supplies and demands that are predictable based on applicable restrictions and regulations and other factors affecting both supply and demand. This section describes the estimated deficit in water supply compared to demand, the actions and circumstances that could affect that estimate, and the actions that would be triggered by that deficit in order to maintain essential water supply and comply with regulations (i.e., the conservation and rationing requirements described below).

Supply Shortages

Baseline water demand in the service area is approximately 12,595 afy based on 2010 annual demand of 12,270 afy and 325 afy for existing Pebble Beach water entitlements, shown in Table 2-3 in Chapter 2. Under the No Project Alternative, no increase from baseline water demand would be reasonably predictable. Because the MPWSP or an alternative new water supply would not be implemented, this scenario assumes that potential demands associated with hospitality industry rebound[3] and legal lots of record could not be served, and thus are not counted among demands under the No Project Alternative. This scenario also assumes that there would be no "payback" to the Seaside Groundwater Basin of the amount of water CalAm has pumped in excess of its adjudicated right. That is, given that the commencement of the basin replenishment (or payback) is contingent upon having a new water supply to augment existing sources,[4] it is assumed that under this alternative, CalAm's basin replenishment obligation would be delayed indefinitely due to the lack of sufficient supply.

[3] Increased demand that resulted from economic recovery at existing businesses would not require new water connections or permits to be served. However, given the constrained supply that would result under the No Project Alternative, economic rebound resulting in increased demand at existing water customers is not considered reasonably foreseeable under this alternative. Therefore, additional demand at existing businesses resulting from economic recovery is not considered part of the baseline service area demand for this analysis. (See also Section 5.5.20 regarding anticipated socioeconomic impacts of the No Project Alternative, and the discussion of this demand component in Section 6.3, which assumes that a degree of economic rebound identified by CalAm in its application as future demand has already occurred and is therefore reflected in existing annual demand.)

[4] As discussed in Chapter 2, Section 2.2.4, CalAm is required to replenish the quantity of groundwater it has produced in excess of its adjudicated right in the period since the groundwater basin was adjudicated. CalAm's commitment to replenish the groundwater basin is based on a 2008 Memorandum of Understanding between CalAm and the Seaside Groundwater Basin Watermaster that calls for CalAm to commence replenishment on a feasible schedule upon completion and implementation of a water supply augmentation project. In 2014, CalAm and the Watermaster agreed to a replenishment schedule of 25 years at a replenishment rate of 700 afy upon completion and implementation of the MPWSP. CalAm's production from the basin during the replenishment period under the MPWSP would therefore be limited to 774 afy for 25 years. This replenishment would not occur under the No Project Alternative.

During the Revised CDO extension period under the No Project Alternative, CalAm's available supply of potable water to serve the Monterey District would decrease from 11,314 afy to 6,380 afy between 2017 and 2021. Supply would consist of the following existing sources:

- Continued use of Carmel River system water in compliance with SWRCB Order 95-10 and the Revised CDO; water supply of 8,310 afy, reduced by 1,000 af each October from 2018 through 2021, and 3,376 afy thereafter (*i.e., the Effective Diversion Limit; see Table 5.4-2 for difference between proposed project and No Project Alternative by water year*);
- Continued pumping of 1,474 afy from the Seaside Groundwater Basin (*in accordance with the Seaside Groundwater Basin adjudication; compared to 774 afy under the proposed project during 25-year replenishment period, and 1,474 afy thereafter*);
- Continued use at the end of the Revised CDO extension period of approximately 230 afy provided by Sand City's existing desalination plant (*eventually decreasing to CalAm's long-term supply from Sand City desalination plant of 94 afy, same as proposed project*); and
- Continued use of 1,300 afy from the existing Phase I and II projects of the ASR system.

SWRCB Order WR 2016-0016 extends the date by which CalAm must terminate all unlawful diversions from the Carmel River from December 31, 2016, to December 31, 2021. The Revised CDO set an initial diversion limit of 8,310 afy for Water Year 2015-2016 (October 1, 2015 to September 30, 2016) and established annual milestones that CalAm must meet in order to maintain the 8,310 afy diversion limit through 2021. Meeting the milestones would demonstrate tangible progress in developing an alternative water supply that will enable CalAm to reduce and terminate its unlawful diversions. If CalAm fails to meet a milestone in any given water year, the Revised CDO specifies that the annual diversion limit will be reduced by 1,000 afy for each of the following water years. The 1,000 afy reduction is only further reduced if another milestone is not met. Because five of the seven milestones require (or consist of) MPWSP approval, they would not be achievable under the No Project Alternative (which by definition assumes that the MPWSP would not be approved). Therefore, between 2016 and 2021, CalAm's diversions from the Carmel River would be reduced as shown below in **Table 5.4-3**. The analysis assumes that CalAm would achieve the milestones related to the Pure Water Monterey Groundwater Replenishment Project (GWR Project), which do not depend on MPWSP approval. Thus, based on the assumptions regarding Revised CDO milestones shown in the **Table 5.4-3**, prior to December 31, 2021 CalAm's supply from the Carmel River would range from 8,310 afy in 2016 to 4,310 afy at the end of 2021, and consist of its legal limit, 3,376 afy, thereafter.

In addition to the above-listed existing sources of water, the approved GWR Project, if fully implemented, could provide additional supply to the Monterey District. The GWR Project is separate from MPWSP and is considered a reasonably foreseeable project in the cumulative context for the No Project Alternative, but is not a component or consequence of this alternative, and therefore is not considered further in this subsection as a potential source of supply. See Section 5.4.2.4, Ability to Meet Project Objectives.

TABLE 5.4-3
ANTICIPATED CARMEL RIVER SYSTEM WATER SUPPLY UNDER THE NO PROJECT/ NO ACTION ALTERNATIVE BASED ON ORDER WR 2016-0016

Water Year	Milestone	Milestone Feasible / Assumed to Be Met under No Project / No Action?	Assumed Diversion Limit under No Project / No Action (afy)	Assumed Diversion Limit under Proposed Project (all milestones met; afy)	Date Reduction Assessed
2015-2016	CPUC approval of (1) Water Purchase Agreement for GWR Project water and (2) construction of CalAm components of the GWR Project conveyance facilities (the Monterey Pipeline and Pump Station)	Yes[a]	8,310	8,310	12/31/2016
2016-2017	Construction of the Monterey Pipeline and Pump Station commences	Yes[a]	8,310	8,310	Oct 1, 2017
2017-2018	CPUC Issuance of CPCN for MPWSP	No[b]	8,310	8,310	Oct 1, 2018
2018-2019	Construction of MPWSP desalination plant commences	No	7,310[c]	8,310	Oct 1, 2019
2019-2020	Completion of at least one source water production well; partial completion of other MPWSP components	No	6,310[c]	8,310	Oct 1, 2020
2020-2021	Additional progress on MPWSP production wells and other components	No	5,310[c]	8,310	Oct 1, 2021
2021-2022 and beyond	Substantial completion of MPWSP, allow delivery of MPWSP water	No	4,310 – 3,376[d]	8,310 to 3,376[d]	NA

NOTES: NA = Not applicable

[a] The milestones related to the GWR Project, which do not depend on MPWSP approval, have already been achieved.
[b] Issuance of a Certificate of Public Convenience and Necessity (CPCN) would constitute project approval, which is not assumed under this alternative.
[c] The City of Pacific Grove Local Water Project (No. 22 in Table 4.1-2 in Section 4.1) and the Monterey-Pacific Grove Area of Special Biological Significance (ASBS) Stormwater Management Project (No. 45 in Table 4.1-2 in Section 4.1) are recognized in the CDO as an available water supplies that if developed by Pacific Grove, would offset the required reductions resulting from a missed milestone, one acre foot for every acre foot offset by the use of recycled water. These projects could provide up to 192 afy in offset demand
[d] This analysis assumes a diversion limit of 4,310 afy through December 31, 2021 and diversions of only 3,376 afy, CalAm's legal entitlement, thereafter.

SOURCE: SWRCB, 2016.

The No Project Alternative water supplies of 11,314 afy through September 2018, which would be reduced to 6,380 afy by January 2022, could not serve the baseline demand of 12,595 afy. It is assumed that CalAm and MPWMD would continue their implementation of existing conservation programs and measures, described in Appendix K, with the same intensity as under existing conditions. Because these programs and measures, such as limiting losses from aging pipes, are existing and ongoing efforts, they are not considered a component of the No Action Alternative, but do provide context for potential further reductions in demand compared to baseline. Estimates of the effect of these ongoing programs on baseline demand are provided in Appendix K to the extent that they can be quantified. As described in Appendix K, the expected reduction in demand by 2021 from these ongoing conservation and demand management measures is approximately

1,260 afy, resulting in a total estimated baseline demand in 2021 of approximately 11,335 afy (i.e., 12,595 afy less 1,260 afy).

Monterey Peninsula Water Conservation and Rationing Plan Actions

Even with the potential reductions in demand between 2016 and 2021 described above, CalAm's available supply would not be able to meet estimated demand during any water year under the No Project Alternative. The long-term available water supply totaling approximately 6,380 afy at the end of the Revised CDO extension period (2021) is roughly 6,215 afy less than or approximately 51 percent of the existing baseline demand of 12,595 afy. Even assuming continued conservation efforts, this amount is roughly 4,955 afy less than or 56 percent of the total estimated demand of 11,335 afy anticipated by 2021 (reductions described above).[5] It is assumed that this deficit between available supplies and total demand under the No Project Alternative would trigger actions under MPWMD's 2016 Monterey Peninsula Water Conservation and Rationing Plan (Conservation and Rationing Plan) (MPWMD, 2016).

The Conservation and Rationing Plan, which comprises MPWMD Rules 160 to 167, requires (pursuant to MPWMD Rule 160) that MPWMD approve a physical storage target, as of May 1 each year, for the sources within the Monterey Peninsula Water Resources System (MPWRS)[6] and approve the distribution of monthly production from the water sources within the MPWRS on a quarterly basis. The production targets are based on production limits specified in SWRCB CDO Order WR 2009-006 and the Seaside Groundwater Basin Adjudication Decision. Triggers for Stages 2 and 3 Conservation and Stage 4 Rationing are determined, in part, by comparison of the annual available storage with storage that had been needed in the previous 12 months and comparison of the monthly production targets with actual monthly production. As with MPWMD's previous water conservation and rationing plan, Stage 1, Water Conservation: Prohibition of Water Waste (MPWMD Rule 162), remains in effect at all times and applies to all water users.

As noted, production targets are based on production limits specified in the CDO and the Seaside Groundwater Basin Adjudication. Therefore, under the No Project Alternative, production targets would be based on available supplies discussed above (i.e., no more than 3,376 afy from the Carmel River and 1,474 afy from the Seaside Groundwater Basin). Currently, actual production is more than 4,500 afy greater than the final Carmel River production limit of 3,376 afy. This analysis therefore assumes that actual production in the 12 months before the final CDO production limit takes effect would exceed the production target by more than 5 percent and

5 A comparison of available supplies under the No Project Alternative at the end of the Revised CDO extension period with the most recent demand year, 2015, reveals a smaller but still substantial shortfall – 3,165 afy. Since 2015 was the fourth year of a major drought, during which drought regulations were in effect and there was heightened awareness of drought conditions, and does not include demand associated with existing Pebble Beach water entitlements, this analysis considers the comparison with 2010 demand and Pebble Beach entitlements, reduced by additional ongoing conservation programs, to more accurately reflect the difference between available supplies under the No Project Alternative and existing service area demand. These comparisons of available supplies and demand do not include demand associated with vacant legal lots of record or economic recovery that CalAm proposes to meet with the MPWSP (discussed in Section 2.3.3 of Chapter 2, Water Demand, Supplies, and Water Rights).

6 System storage includes storage in the Carmel Valley Alluvial Aquifer, the Seaside Groundwater Basin, and the Los Padres Reservoir.

trigger Stage 3 Water Conservation: Conservation Rates (MPWMD Rule 164), which could lead to Stage 4 Water Rationing (MPWMD Rule 165).

Stage 3 Water Conservation involves implementation of two succeeding conservation rate levels. Level 1 consists of a 25 percent surcharge on then-existing rates and Level 2 (to be implemented after the imposition of Level 1 for three months, if the monthly production target continues to be exceeded) consists of a 40 percent surcharge. (Neither surcharge would apply to residential customers in the first tier of water usage.) Stage 4 Water Rationing could be triggered if Stage 3 is deemed unsuccessful or Stage 3 fails to sunset after a period of eight months. Stage 4 could also take effect if directed by a governmental or regulatory agency to enact Stage 4 (which is also the case for Stages 2 and 3). The Conservation and Rationing Plan specifies that Stage 4 shall not be triggered "if the General Manager determines upon credible evidence that production targets associated with the final Cease and Desist Order are likely to be met by adhering to the requirements of a lesser Stage."

Mandatory reductions established under Stage 4 would be equal to the shortfall (e.g., the amount by which the last 12 months' actual production exceeded the then-current production target) or another amount reflected in a governmental or regulatory order. Stage 4 rationing measures could include:

- prohibitions on all or specified non-essential water uses;
- a moratorium on accepting water permit applications;
- a prohibition against new water service;
- suspension of annexations to CalAm's service area;
- restrictions on watering and irrigating; and
- requirements for specific reductions in residential water use.

Summary

Impacts related to a No Project Alternative could result in severely supply-constrained conditions in CalAm's Monterey District. Existing conservation programs would continue to be implemented and new conservation and rationing measures would be required in an attempt to balance out the severe supply shortfall following Carmel River diversion curtailments under the Revised CDO in 2018 through 2021. Given the limited water supplies, it is assumed this alternative would trigger Stage 3, Conservation Rates, and very possibly Stage 4, Rationing Measures, of the Monterey Peninsula Water Conservation and Rationing Plan.

5.4.2.4 Ability to Meet Project Objectives

Ability to Meet Project Objectives under Baseline Conditions

The No Project Alternative would fail to meet almost all of the key objectives of the MPWSP. This alternative would achieve compliance with the Revised CDO and Seaside Basin Adjudication, but would not provide a replacement water supply in order to do so. The available potable water supply under the No Project Alternative at the end of the Revised CDO extension period would be approximately 6,380 afy. This represents approximately 51 percent of baseline demand and approximately 56 percent of estimated demand after implementation of foreseeable demand management efforts described in Section 5.4.2.3 and Appendix K. This alternative would not provide supply to allow for replenishment of water that CalAm previously pumped from the Seaside Basin in excess of CalAm's adjudicated right; would not provide water supply reliability; and would not provide supply for the development of vacant legal lots of record or supply to meet demand resulting from economic rebound of the hospitality industry (see Section 2.3.3, Other Service Area Demand Assumptions, for a discussion of these demands). The limited available water supply would trigger rationing measures and could lead to water shortages throughout the CalAm Monterey District service area.

Ability to Meet Project Objectives Assuming Implementation of the GWR Project

As noted above in Section 5.4.2.1 and shown in **Table 5.4-2**, the Carmel River supply that is assumed to be available during the Revised CDO extension period under the No Project Alternative is based on the assumption that the Revised CDO milestones pertaining to the GWR Project (which do not depend on MPWSP approval) would be met, and as of publication of the Draft EIR/EIS, these milestones have been met. The GWR Project, when constructed, would provide 3,500 afy of potable supply for the CalAm service area. With the GWR Project supply, total supplies available to CalAm at the end of the Revised CDO extension period would total about 9,880 afy, which is about 78 percent of baseline demand and approximately 87 percent of estimated demand after implementation of foreseeable demand management and offset programs and other planned projects described in Section 5.4.2.3. Although this volume of supply would be much closer to the existing demand, the No Project Alternative in combination with the GWR Project would fail to meet most project objectives. While this scenario would achieve compliance with the Revised CDO and the Seaside Groundwater Basin Adjudication, even in combination with the GWR Project, the No Project Alternative would not provide supply to allow for replenishment of water that CalAm previously pumped from the Seaside Basin in excess of CalAm's adjudicated right; would not provide water supply reliability; and would not provide supply for the development of vacant legal lots of record or supply to meet demand resulting from economic recovery and rebound of the hospitality industry. In addition to failing to provide sufficient supply to meet the average demands assumed in MPWSP planning, the No Project Alternative combined with a GWR Project water purchase agreement would not provide sufficient supply flexibility to meet most peak demands.

5.4.3 Alternative 1 – Slant Wells at Potrero Road

5.4.3.1 Overview

This alternative is based on the screening of individual project components conducted in Section 5.3, Alternatives Development and Screening Process. Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.3.3.2, Intake Option 3 – Subsurface Slant Wells at Potrero Road). The desalination plant, brine discharge, product water conveyance pipelines and ASR components would be identical to the proposed project described in Chapter 3. Therefore, the description of

Alternative 1 focuses on the locations for the intake system and source water pipelines that are different from the proposed project.

This alternative would include the decommissioning of the test slant well at CEMEX, and construction of 10 subsurface slant wells in the beach parking lot at the west end of Potrero Road in northern Monterey County, near the southern border of the unincorporated community of Moss Landing (see **Figure 5.4-1**). The Potrero Road beach parking lot, which is owned and operated by the California Department of Parks and Recreation (California State Parks), lies within the coastal zone. The LCP land use plan designation for lands adjacent to the Potrero Road parking lot is Scenic and Natural Resource Recreation. The zoning designation of lands adjacent to the parking lot is Open Space Recreation (OR). This alternative would require CalAm to obtain an easement, right-of-entry, and/or lease agreement from the California State Parks for any facility that would encroach upon State Parks Property.

The slant wells would be grouped in two clusters, with five wells in each cluster and buried in the parking area, below the hardened sand parking surface. The wellheads would be located above the maximum high tide elevation and encased in a concrete vault that could be up to 20 feet wide, 30 feet long and 10 feet deep, and buried 5 feet below grade. The concrete vault would provide maintenance access to the well heads and pumps. The slant wells would be designed as pumping wells (i.e., each well would be equipped with an electric submersible pump) and would extend 220 to 535 feet seaward of the mean high water line (MHWL), terminating approximately 120 to 150 feet under the seafloor in Monterey Bay, within the submerged lands of MBNMS.

The electrical controls for the slant wells would be located at the edge of the parking lot. The electrical control building, the only above-ground structure, would be approximately 4 feet wide, 12 feet long, and 6 feet high. Overhead electrical lines would extend from the electrical control building to Potrero Road and east along the north side of Potrero Road to connect with the existing Pacific Gas and Electric (PG&E) power line on Potrero Road.

A short, 36-inch-diameter collector pipeline would convey the water from the slant well clusters to a source water pipeline that would be constructed within Potrero Road. The source water pipeline would be located within existing rights-of-way to convey water to the desalination plant at Charles Benson Road.

The source water pipeline would extend directly east from the parking lot -- south of and parallel to Potrero Road -- continue south along Highway 1, south/southeast along Molera Road, and southwest along Monte Road to the desalination plant site on Charles Benson Road (**Figure 5.4-1**). Other than the source water pipeline, which would result in approximately 5.5 miles of additional pipeline, all other pipelines would be the same as the proposed project.

5.4.3.2 Construction

All onshore construction activities and disturbance would occur in the parking lot at the western terminus of Potrero Road, and would not disturb the dunes or active beach area. Slant well construction would occur year-round and the entire parking lot, measuring less than one acre, would be closed during construction of the slant wells and associated infrastructure. The slant wells would be designed using similar materials, size and construction methodology as the proposed slant wells for the MPWSP. The boreholes would be approximately 900-1,000 feet long and drilled at an angle of 10 degrees below horizontal across the shallow Dune Sand Aquifer and the deeper Perched "A" Aquifers; the Perched "A" Aquifer is underlain by the relatively impermeable Salinas Valley Aquitard. The length of the wells and screen section intervals would depend on the aquifer materials encountered, and would extend under MBNMS submerged lands. The slant wells would be completed using up to 22-inch-diameter casings and up to 12-inch-diameter stainless steel screens. Effluent generated during construction and development of the slant wells would be placed in Baker tanks to allow sediment to settle out, and then discharged into a buried diffuser system in the parking lot for percolation into the underlying beach sands. Cuttings generated during the drilling process and the well head construction would be drained in a separation unit, with the drainage discharged to the buried diffuser. The dewatered cuttings (estimated at less than 200 cubic yards) would be hauled offsite for final disposal at an approved site.

Electrical power for pumping operations would be provided by connecting to PG&E's existing service at the Potrero Road site, located at the northeast corner of the parking lot. New power poles are anticipated to be installed by PG&E to reach the well site. A buried electrical conduit would be installed to convey power from the northwestern most power pole to an above ground 4 feet long, 2 feet wide, and 6 feet tall electrical control panel.

Alternative 1 would require the use of horizontal directional drilling (HDD) techniques to install pipeline underneath the Old Salinas River, Tembladero Slough, and the Salinas River. HDD is described in Section 3.3.4.3 of Chapter 3, Description of the Proposed Project. Other than the extended source water pipeline, all other pipelines would be constructed in the same manner and at the same locations as the proposed project.

5.4.3.3 Operation and Maintenance

Operation and maintenance requirements would be similar to that of the proposed project intake wells, except that they would occur at the Potrero Road location. All other aspects of operations and maintenance of the slant wells under Alternative 1 would be the same as the proposed project (see Sections 3.3 and 3.4 of Chapter 3, Description of the Proposed Project).

5.4.3.4 Ability to Meet Project Objectives

Alternative 1 would contain the same elements as the proposed project and would produce the same volume of product water. However, because of the hydrogeology of the Potrero Road area, Alternative 1 would draw a greater volume of water from the Salinas Valley Groundwater Basin than the proposed project. In the event the Salinas Valley Return Water obligation is determined to be 12 percent (the highest return value simulated), Alternative 1 would meet the need for replacement supplies and meeting peak month demand, but limited supply would be available for other uses, including accommodating tourism demand under recovered economic conditions. Alternative 1 would not provide sufficient supplies to serve existing vacant legal lots of record and would therefore, not meet the project objective/need for water, some of which was to support limited growth (e.g., Objective 6).

NOTES:
* See Subsection 7.10 for a description and analysis of this Alternative Salinas Valley Return option.

SOURCE: ESA, 2015

205335.01 Monterey Peninsula Water Supply Project
Figure 5.4-1
Alternative 1- Slant Wells at Potrero Road

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5.4.4 Alternative 2 – Open-Water Intake at Moss Landing

5.4.4.1 Overview

This alternative is based on the screening of individual project components conducted in Section 5.3, Alternatives Development and Screening Process. Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a screened open-water intake system located offshore and southwest of the Moss Landing Harbor entrance (described in Section 5.3.3.6, Intake Option 9 – Screened Deep-water Ocean Intake at Moss Landing). The existing test slant well would be decommissioned, and except for an additional 6.5 miles of source water pipeline, the desalination plant, brine discharge, new Desalinated Water Pipeline, new Transmission Main, and ASR components would be identical to the proposed project described in Chapter 3, Description of the Project. The Castroville Pipeline, Pipeline to Castroville Seawater Intrusion Project (CSIP) Pond, and operational components related to delivering water to Castroville Community Services District (CCSD) would not be implemented. Therefore, the description of Alternative 2 focuses on the intake system and source water pipelines that are different from the proposed project.

Open Ocean Intake System

The intake system would consist of a new intake structure in the Monterey Submarine Canyon to draw in raw seawater from the waters of MBNMS, intake piping to deliver the seawater to the shore, and an onshore intake pump station to pump the seawater to the desalination facility.

The proposed intake structure would be located on the seafloor within a ravine near the head of the Monterey Submarine Canyon, southwest of the Moss Landing Harbor entrance (see **Figure 5.4-2**) in MBNMS. The intake structure would be installed at the end of a new subsurface intake pipeline at the point where it emerges from below the seafloor approximately 1,300 feet offshore from the mean high water line (MHWL) at a depth of approximately 156 feet below mean lower low water (MLLW), in the waters of MBNMS.

The intake structure would consist of a 36-inch diameter pipeline mounted with concrete pipe supports on a reinforced concrete pad fixed to the seafloor with screw-type anchors. The intake structure would be connected to the intake pipeline with flexible couplings and would have three wedgewire screen assemblies; each assembly would have two screens. The passive narrow-slot wedgewire screens would have a 1-millimeter (mm) slot size, and the screened intake water velocity would be at or below 0.5 feet per second.

Intake Pump Station and Source Water Pipeline

Seawater would be conveyed approximately 3,600 feet from the intake structure to an onshore pump station via a 36-inch-diameter subsurface intake pipeline. A partially buried intake pump station located near the end of the railspur (on Dolan Road near SR-1) would pump the seawater to the proposed desalination plant on Charles Benson Road through a 36-inch-diameter source water pipeline. The approximate 8-mile-long pipeline alignment from the intake pump station at Moss

Landing would extend west along Dolan Road to Highway 1, continue south along Highway 1, then south/southeast along Molera Road, then southwest along Monte Road to the desalination site on Charles Benson Road.

5.4.4.2 Construction

Under Alternative 2, construction of the intake system would be different than the proposed project, but the construction of the desalination plant, brine discharge facilities, product water conveyance pipelines and ASR would be the same. The open-water intake pipeline would be installed subsurface using HDD from the intake pump station. The existing railspur and underlying embankment would be removed, and the site would be graded to the final elevation of the intake pump station. The HDD entry pit would be within the footprint of the intake pump station. A surface-launched drill rig would drill a pilot bore to the intake structure location. The pilot bore would be enlarged to the size required for the intake pipe by using a back reamer(s). The pipe would likely be assembled on barges, lowered to the seafloor and pulled back through the borehole during the final reaming process.

At the breakout face where the pipeline emerges from the seafloor, a reinforced concrete pad would be secured to the ocean floor. The seafloor may need to be prepared below the concrete pad, using suction and/or mechanical techniques. The amount of seafloor material to be removed would depend on the local changes in bathymetric grade; excavated materials would be transferred to a barge and disposed of in a suitable area onshore or offshore.

Embedment type anchors are currently anticipated to be set into the seafloor to secure the concrete pad. Once the anchors have been installed, the intake structure would be placed on the seafloor. The entire assembly would be built offsite and transported to the intake structure location, then lowered to the seafloor by crane and set into place by divers. Alternatively, the intake structure could be assembled in place by divers as needed using modular components that are fabricated offsite then barged to the site. Once the intake structure has been installed, a prefabricated section of pipe would be used to connect the intake structure to the sub-seafloor pipeline.

5.4.4.3 Operation and Maintenance

Under Alternative 2, operation and maintenance of the desalination plant and product water pipelines would be similar to the proposed project. However, the intake system, including the pretreatment filters, would require increased maintenance due to the increased particulates in the open ocean intake water compared to water drawn through a subsurface intake. The intake screens would require manual cleaning approximately once per year, over a two-day period, using divers. The seawater intake pipeline maintenance would involve pigging; the pig has an abrasive coating that scrubs the pipeline walls, removing any buildup of ocean sediments, mineral deposits, and bio-growth. The pigging process would take approximately three days, it would be confined to the interior of the pipeline, the intake would be out of service during maintenance and material removed during maintenance would be released into the ocean.

SOURCE: ESA, 2015

205335.01 Monterey Peninsula Water Supply Project

Figure 5.4-2
Alternative 2 - Open Water Intake at Moss Landing

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5.4.4.4 Ability to Meet Project Objectives

Alternative 2 would meet most of the project objectives because it contains most of the same elements as the proposed project and would produce the same volume of product water. However, the intake would be located farther north at a location that CalAm does not currently control, resulting in the construction of additional length of source water pipeline. It would also result in additional permitting complexity associated with the construction and operation of an open-water intake due to entrainment and impingement of marine organisms. The increased permitting complexity may delay the availability of the supply relative to the State Board's CDO, delaying the ability to serve water to meet project objectives 1 through 7.

5.4.5 Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 is the Monterey Bay Regional Water Project (MBRWP or DeepWater Desal), which is being proposed by DeepWater Desal, LLC. The DeepWater Desal project will be evaluated in a separate EIR/EIS being prepared by the California State Lands Commission (as the CEQA Lead Agency) and MBNMS (as the NEPA Lead Agency). The California State Lands Commission and MBNMS issued a joint Notice of Preparation/Notice of Intent to prepare a Draft EIR/EIS for the MBRWP project[7] on June 1, 2015 (CSLC, 2015). For the purposes of this EIR/EIS, it is considered as an alternative to the proposed project and the description herein is based on information received from MBNMS. The evaluation of this alternative in this EIR/EIS is based on information available publically, information provided by MBNMS, and the independent judgement of the analysts using the best available information. More detailed analyses of the DeepWater Desal project will be forthcoming in the separate EIR/EIS and will be based on technical studies that were not available at the time this EIR/EIS was being prepared. The approach to analysis of the impacts of the DeepWater Desal project in this EIR/EIS is intended to be reasonable so as not to over- or under-state impacts, but also draws conservative conclusions where information is currently unavailable.

5.4.5.1 Overview

Alternative 3 includes the construction and operation of a screened open ocean intake system, a seawater desalination facility, a co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. Alternative 3 would be developed to meet a regional need for water, and CalAm would be one of several customers, or off-takers, of the supply. CalAm would decommission the test slant well at CEMEX, and purchase water from DeepWater Desal to serve the needs of their customers in the Monterey District. In addition to the facilities proposed by DeepWater Desal and an additional 6.5 miles of source water pipeline, the new Desalinated Water Pipeline, new Transmission Main, Highway 68 interconnection improvements, and ASR components would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The Castroville Pipeline, Pipeline to

[7] State Clearinghouse No.: 2015061001

CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. Alternative 3 includes the following new components:

- Open ocean intake system;
- Brine discharge system;
- Seawater desalination facility;
- Product water distribution systems (e.g., pipelines);
- Data center and back-up power generation; and
- Substation

As shown in **Figure 5.4-3**, the new components of Alternative 3 would be located in the Moss Landing area of unincorporated Monterey County and offshore in the Monterey Bay. Each component is described below.

Open Ocean Intake System

Alternative 3 would include a new, screened, open-water intake system located offshore and southwest of the Moss Landing Harbor entrance. To produce 25,000 afy (22 mgd) of potable water, the desalination facility would need approximately 55,000 afy (49 mgd) of raw seawater (source water). The intake system would consist of a new seawater intake structure, intake piping to deliver the seawater to the shore, and an onshore intake pump station to pump the seawater to the desalination facility via transfer piping. The location of the seawater intake facilities would be the same as identified in Alternative 2. Also, the intake design would be similar to the intake facility design in Alternative 2, but the Alternative 3 structure would be larger (two intake pipes for Alternative 3 versus one intake pipe for Alternative 2) to accommodate a larger project and to provide redundant intake and discharge ability. Additionally, the desalination plant for Alternative 3 is in a different location than Alternative 2, resulting in different source water and desalinated water pipeline alignments.

Intake Structure

As described for Alternative 2, the intake structure would be placed on the seafloor within a ravine near the head of the Monterey Submarine Canyon southwest of the Moss Landing Harbor entrance; its location would be approximately 1,300 feet offshore from the mean high water line (MHWL) at a depth of approximately 156 feet below mean lower low water (MLLW) in the waters of MBNMS.

The intake structure would be approximately 110 feet long, 30 feet wide, and 12 feet tall and would consist of two 42-inch diameter pipe manifolds; each would be mounted with concrete pipe supports on reinforced concrete pads that would be fixed to the seafloor with screw-type anchors. The intake structure pipes would be connected to the intake pipelines with flexible couplings to allow for some movement. Each intake structure pipe would have 6 screen assemblies for a total of 12 screen assemblies; each assembly would have 2 screens. The screen assemblies would draw seawater from the open ocean through fine-mesh passive narrow-slot

SOURCE: ESA, 2015

205335.01 Monterey Peninsula Water Supply Project

Figure 5.4-3

Alternative 3 - Monterey Bay Regional Water Project

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wedgewire screens with a 1 mm slot size, and an intake water velocity at or below 0.5 feet per second. The intake structures would be installed at the end of the subsurface intake pipelines at the point where they emerge from below the seafloor.

Intake Pipelines, Pump Station and Transfer Pipelines

The primary difference between the intake pipelines of this alternative and Alternative 2 is that this alternative includes two intake pipelines rather than one. Seawater would be conveyed approximately 3,600 feet from the intake structure to an onshore pump station via two 42-inch-diameter subsurface intake pipelines. The pump station would be located near the end of the rail spur on Dolan Road near SR-1.

The onshore 3,600-square-foot pump station would be constructed of concrete and would be mostly below-grade with an exposed stairway access hatch, equipment access hatch, and roof heating, ventilating, and air conditioning (HVAC) unit. The intake pump station would contain approximately four centrifugal intake pumps (three operating and one standby), each with a rated capacity of approximately 12,000 gallons per minute and with a discharge pressure of 150 pounds per square inch. Additional features of the intake pump station include a system for pipeline maintenance ("pigging"), cathodic protection, and a water quality sampling station. The only equipment above-grade would be transformers and an emergency backup power supply system that would be housed in a small building. A gravel access entrance to the intake pump station from Dolan Road would be provided, along with a small parking area. Security fencing would be built around the facility and a security gate would provide for controlled access to the pump station.

A chemical biofouling control system would be included in the design of the pump station, and would prevent biological growth on the walls of the seawater conveyance pipelines. If required, biofouling control would be accomplished by periodic addition of liquid sodium hypochlorite.

The onshore intake pump station would pump the seawater to the main facility site through two 36-inch-diameter transfer pipelines installed via conventional trenching under Dolan Road. The transfer pipelines would be approximately 5,800 linear feet or 1.1 miles in length extending from the intake pump station to the main facility site.

The intake piping system would include multiple manifold access points at the main facility site, from which cold seawater would be directed to individual data center buildings (described below) for use in cooling. From the data center buildings, the warmed seawater would be pumped back to the intake pipeline. Following the data center interconnections, the warmed seawater would flow into an interim warm water holding tank, with a capacity of approximately 350,000 gallons. From the holding tank, the warmed seawater would be pumped to the desalination facility by a booster pump station located within the data center boundary. The booster pump station would be designed at the same capacity and redundancy as the intake pump station.

Brine Discharge Facilities

The desalination facility would generate approximately 30,000 AFY of brine as a result of the reverse osmosis treatment process and the discharge system would include the following three components:

- Brine pump station;
- Discharge pipelines; and
- Discharge diffuser structure.

Brine Pump Station and Discharge Pipelines

Brine would be discharged from the desalination facility to the offshore diffuser structure via two proposed subsurface 36-inch-diameter discharge pipelines. The discharge pipelines would be approximately 12,000 linear feet (2.3 miles) in length, extending from the desalination facility underground and would emerge from the seafloor northwest of the Moss Landing Harbor entrance. A brine pump system would be built at the desalination facility site to provide the required pressure and velocity at the discharge diffuser structure. The same HDD pit for the intake pipelines would be used for the discharge pipelines, which would be within the intake pump station footprint.

Discharge Diffuser Structure

The discharge diffuser structure would be located on the seafloor of Monterey Bay approximately 3,400 feet offshore from the mean high water line (MHWL at a depth of approximately 76 feet below mean lower low water (MLLW) (see Figure 5.4-3), where the two discharge pipes emerge from the seafloor. The ends of the two discharge pipes would create a confluence with a single 36-inch-diameter pipe manifold structure consisting of five separate standing pipe risers. Each riser would be fitted with a duckbill diffuser nozzle, capable of discharging a maximum of 5.45 mgd, for a combined discharge total of 27.26 mgd. The completed diffuser assembly would be about 140 feet long, 10 feet wide and 15 feet tall. The diffuser structure would be buried in riprap protective cover and ballast stone that would be placed up to the level of the diffuser, extend out a few feet in either direction, then descend down to the seafloor at a 4:1 horizontal to vertical slope. The ballast and armor stone may need to be keyed a few feet below the seafloor over a horizontal width of five feet. Approximately 8,000 cubic yards of armor ballast stone would be needed. Only the duckbill diffuser nozzles would extend above the protective cover.

Desalination Facility, Data Center, and Substation (Main Facility Site)

The Alternative 3 desalination facility, data center, and electrical substation components would be located in the Moss Landing area of unincorporated Monterey County. These facilities would be located on the south side of a 110-acre parcel off Dolan Road (main facility site). This parcel, also referred to as the East Tank Farm Parcel, is located on the north side of Dolan Road, approximately 1.5 miles east of Highway 1. The site is bordered by Dolan Road on the south, the Moss Landing Power Plant (MLPP) on the west, and predominantly agricultural lands and the Elkhorn Slough to the north and east.

Desalination Plant

Alternative 3 would include the construction and operation of a desalination facility on the main facility site off Dolan Road. The facility would produce 25,000 afy of potable water from raw seawater and would generate 30,000 afy of brine concentrate (brine) as a by-product.

The desalination plant would house all of the equipment used for the desalination process, except for the seawater intake system, brine discharge system, and product (potable) water distribution systems. The desalination plant would provide the following primary systems:

- Heat-transfer process (housed at data center);
- Pre-treatment system;
- Desalination and energy recovery system;
- Solids/residuals handling systems;
- Post-treatment system; and
- Finished product water storage and pump station.

The details of these facilities and associated operations are explained below. Major buildings that would house these systems are identified in **Table 5.4-4**. Additional details on the RO process are provided in Section 3.2.2.2 of Chapter 3, Description of the Proposed Project.

Heat-Transfer Process

The intent of co-locating the desalination facility and the data center would be to cool the data center with seawater rather than conventional cooling methods, and to warm the seawater with data center waste heat prior to the RO treatment process.[8] Therefore, the initial step in the RO treatment process would include capturing heat from the data center through a closed-loop cooling system. The seawater routed through a heat exchanger prior to entering the desalination facility would be used to cool the data center buildings and as a result, the seawater would be heated for the RO treatment process.

Pre-Treatment System

After the heat transfer process and prior to desalination, the seawater would require filtration to remove suspended solids and organic matter that could foul the RO membranes. The pre-treatment system could consist of dissolved air flotation, flocculation/sedimentation system, or a dual-media primary filtration system followed by a single-stage, deep-bed, dual-media filtration system with sufficient redundancy. The pre-treatment requirements would be determined after additional source water sampling is conducted as part of obtaining the drinking water permit for this alternative. The pre-treatment media filters would be designed to utilize filtered seawater or RO brine as a source of backwash water. Most of the backwash wastewater would be recycled through the backwash reclaim system. Following pre-treatment, filtered water would pass through micron cartridge filters that would capture any residual material not removed by the pre-treatment media filters. The product of the pre-treatment process is called feed water.

[8] Seawater warmed by heat from the data center would increase the efficiency of the desalination process (by making the membranes more malleable) and would therefore, reduce the energy required to operate the desalination facility.

TABLE 5.4-4
SUMMARY OF ALTERNATIVE 3 COMPONENTS CONSIDERED FOR ANALYSIS

Project Component	Component Characteristics	Quantity	Approximate Size	Maximum Height (in feet above grade)
Seawater Desalination Facility				
Pre-treatment systems	Dissolved air flotation, flocculation/sedimentation system, or a dual-media primary filtration system followed by dual-media filtration system.	1–2 buildings	TBD	35 feet
Backwash treatment system	Periodic backwashing of filters to remove accumulated solids.	1 building/enclosure	TBD	20 feet
Cartridge filtration system	Following pre-treatment, filtered water would pass through micron cartridge filters to capture residual matter. Systems include wetwell and pumps.	1 building	TBD	30 feet
Seawater reverse osmosis desalination and energy recovery system	Semi-permeable membranes to separate and concentrate salts from seawater, resulting in permeate (water that will become potable water) and a concentrated solution called brine. System includes pumps, treatment units, and energy recovery devices.	1 building	TBD	35 feet
Solids handling system	A lamella clarifier/solids settling system with integrated surge basin and either a belt filter press or centrifuges to achieve greater than 20% dry solids.	1 building/ enclosure	TBD	35 feet
Post-treatment system	Calcite or lime and carbon dioxide conditioning of SWRO permeate to adjust and stabilize pH. Includes a drawback tank and calcite contactors.	Multiple tanks	TBD	35 feet
Product water storage and delivery	Product water storage tanks, product water pump stations, and surge tank. Product water pump station discharges potable water into the distribution system.	1–2 finished water tanks 1–2 pump stations 1 surge tank	TBD	40 feet (finished water tank) 20 feet (pump station) 25 feet (surge tank)
Chemical storage and delivery	Fully contained bulk storage tanks.	1 building	TBD	30 feet
Transformer pad and MCC area	--	—	—	—
Control building	Control room, offices, bathrooms, storage, and maintenance shop.	1 building	TBD	35 feet
Parking	Desalination facility paved parking.	20 spaces	NA	NA

TABLE 5.4-4 (Continued)
SUMMARY OF ALTERNATIVE 3 COMPONENTS CONSIDERED FOR ANALYSIS

Project Component	Component Characteristics	Quantity	Approximate Size	Maximum Height (in feet above grade)
Seawater Intake System				
Intake structure	Located on the seafloor at a depth of approximately 156 feet, below mean lower low water (MLLW), would draw seawater from the open ocean in the MBNMS through fine-mesh screens (passive narrow-slot wedgewire screens with 1-millimeter slot size).	each structure consists of 2 pipes with 12 screen assemblies with 2 screens each that is screw-anchored to the seafloor and connected to an intake pipeline	110 feet long 30 feet wide	12 feet tall (above seafloor)
Intake pipelines	Convey seawater from the intake structure to onshore pump station.	2 pipelines	42-inch-diameter 3,600 linear feet	Below seafloor
Intake pump station	Draw seawater from the intake structure and pump it to the desalination facility.	1 building	3,600 square feet	Mostly below grade
Transfer pipelines	Transfer pipelines would carry the seawater from pump station to the desalination facility.	2 pipelines	36-inch-diameter 5,800 linear feet	Below grade
Brine Discharge System				
Brine discharge diffuser structure	Located on the seafloor at a depth of approximately 76 feet and would discharge brine into the MBNMS via a multi-jet linear diffuser designed to rapidly mix the brine with ocean water.	1 discharge structure consisting of 1 pipe with 5 separate pipe risers, each having a duckbill diffuser nozzle. Each structure is buried in riprap protective cover and ballast stone that would be placed up to the level of the diffuser	140 feet long 10 feet wide	15 feet tall (above seafloor)
Brine pump station	Located at the desalination facility, would provide required pressure and velocity at the discharge structure.	1 pump station	TBD	TBD
Discharge pipelines	Underground pipelines would convey brine from the desalination facility to the discharge diffuser structure in the ocean.	2 pipelines	36-inch-diameter 12,000 linear feet	Below grade
Product Water Distribution System				
Monterey Peninsula Distribution System	Pipeline that could transport 9 million gallons per day (MGD) of product water.	1 pipeline	36-inch-diameter	Below grade

TABLE 5.4-4 (Continued)
SUMMARY OF ALTERNATIVE 3 COMPONENTS CONSIDERED FOR ANALYSIS

Project Component	Component Characteristics	Quantity	Approximate Size	Maximum Height (in feet above grade)
Data Center				
Data center	Provides data transmission and data storage capabilities.	4 buildings	Approximately 1 million square feet	35 feet
Closed-loop cooling system	Each data center would include a closed-loop cooling system to provide air conditioning to offices and computer server areas.	4 (1 for each building)	NA	NA
Backup power supply	Back-up power generators to provide required redundant electrical power to data center and desalination facility in case of a full or partial loss of PG&E electrical services. Generators to be located in a generation plant building.	1 building 3 natural gas-fueled generators	10 megawatts (MW) each	35 feet (building)
Parking	Data center parking	138 spaces	NA	NA
Substation				
Substation	Provide a redundant supply of electric power.	1 substation	230 kV 137,000 square feet	40–50 feet
Switchgear building	House the switchgear assembly circuit breakers and associated substation auxiliary equipment.	1 building	960 square feet	12 feet
Control building	House other control and metering equipment.	1 building	800 square feet	12 feet
Electrical transmission facilities	Provide for interconnection to PG&E's transmission system located on the main facility site. Includes transmission lines, transmission towers, and underground circuits.	5 towers	NA	85–140 feet

NOTES:
TBD = To Be Determined at a later design stage
NA = Not Applicable

Desalination and Energy Recovery System

Approximately six to 10 RO pumps (plus one standby) would be used to pump the feed water through the reverse osmosis membranes. Each pump would have a rated capacity of approximately 1,600 to 2,500 gallons per minute. When the feed water is pressurized against the RO membrane surface, two resulting streams emerge: high-quality permeate (the water that would eventually become product or potable water) and concentrated brine. An integrated isobaric energy recovery system would recapture hydraulic energy. One complete standby RO unit and energy recovery system would be available to ensure reliable water treatment production.

Solids/Residuals Handling Systems

The pre-treatment filtration system would require periodic backwashing to remove accumulated solids retained by the filters. Filter backwash would be collected and treated in a backwash solids handling system consisting of a lamella clarifier/solids settling system with integrated surge basin, and either a belt filter press or centrifuges to achieve greater than 20 percent dry solids. The basin would be glass-lined bolted steel or concrete designed to contain sufficient backwash volume to stabilize feed flow to the solids settling system. A mixture of duplex stainless steel and thermoplastic valves, pipe, and fittings would be used throughout the system.

The RO membranes would require periodic cleaning in order to maintain efficiency. The cleaning process typically includes the use of a detergent in either an acid or base solution, depending on the nature of material being removed. Spent (used) membrane cleaning solution would be collected and neutralized prior to discharge into the brine discharge line or alternatively to the sanitary sewer, as determined by applicable regulation. The neutralization tank would have a capacity equal to one complete membrane-cleaning event and would be constructed of glass-lined bolted steel, fiberglass, or concrete. Approximately four membrane-cleaning events are anticipated annually.

Post-Treatment System

A portion of the reverse osmosis permeate would require post-treatment conditioning with calcite or lime and carbon dioxide for pH adjustment and stabilization, followed by disinfection. Sulfuric acid could be used to assist with calcite dissolution, and sodium hydroxide could also be used for pH control downstream of the calcite contactors. Calcite contactors are used to neutralize the pH and to add calcium and bicarbonates to the permeate. The post-treatment system would forward desalted permeate to the calcite contactors and then to the finished water storage tank for blending.

Final Product Water Storage and Pump Station

To provide sufficient retention time for complete disinfection, product water would be temporarily stored on site prior to being forwarded to the distribution pipelines. A distribution pipeline corrosion control inhibitor would also be added, if needed, to ensure that the final product water would be fully compatible with distribution pipeline materials.

The storage facilities would consist of one aboveground tank with provision for a second tank, if required; each with a maximum capacity of 5.5 million gallons. The tanks would be constructed of pre-stressed concrete.

The product water pump station would discharge potable drinking water for distribution. Approximately eight operating pumps and one standby pump would each have a rated capacity of approximately 1,900 gallons per minute and be capable of discharge pressures reaching 100 pounds per square inch to the distribution system.

Data Center

The data center (approximately 1 million square feet of total building space) would be located on the 110-acre main facility site off Dolan Road next to the desalination plant and would consist of the following three major components, which are described below:

- Data center buildings and a landing area;
- Closed-loop cooling system; and
- Back-up power supply.

Data Center Buildings and Landing Area

Four buildings and a landing area (a concrete pad and connection points for electrical and mechanical support) would make up the data center. A data center is made up of computer servers that provide the physical infrastructure to receive and store electronic data for people, businesses, and government entities that can be retrieved by those using the internet. The data center would include approximately 1 million square feet of total building space. Three data center buildings and a concrete landing pad for modular data center equipment are planned.

Closed-Loop Cooling System

Each data center building would include a closed-loop cooling system designed to provide air-conditioning to both office and computer server areas of the buildings. In lieu of the chiller units and evaporative cooling systems typically employed for air conditioning, the data center buildings would use cold seawater to cool the buildings and systems.

A closed-loop heating and cooling system works through heat transfer. Hydronic piping would be routed throughout the data center to each air handling device. This piping would be a closed loop, meaning the same freshwater continues to recirculate through the system. The hydronic system would require an initial "charge" where the entire loop would be filled with water. This water would likely be purchased from Pajaro Sunny Mesa Community Services District and imported to the data center. As water circulates through the closed loop, it would flow through heat exchangers where it would pick up heat from the facility. It would then circulate through a large heat exchanger through which the cold seawater would also be passing. Cold seawater would pass through a non-contact, tube-and-shell, or plate-style heat exchanger where it would collect heat from the data center cooling system. There would be no mixing of seawater with fresh cooling water, and no seawater piping would enter the data center facilities. After leaving the heat exchanger, the warmed seawater would be recombined with the desalination intake pipeline. No seawater would be lost to the heat transfer process.

The data center closed-loop cooling system within each of the four buildings would hold approximately 400,000 to 850,000 gallons of fresh water, for a total of approximately 2.5 million gallons for all four buildings. Prior to the initial charging, the fresh water may require treatment, such as softening and deionization, to remove hardness minerals that could result in scaling.

The closed-loop system would not be expected to consume water during normal operation. There would be incidental losses from system leaks and make-up water would be added during operation to keep the system fully charged. Annual maintenance would include replacing up to 20 percent of the closed-loop system capacity with fresh water. Water from the closed-loop system, whether captured from incidental losses or maintenance procedures, would be discharged to the sanitary sewer system, in compliance with any applicable pre-treatment requirements.

Back-Up Power Supply

Electrical service from the PG&E system would provide the main source of power for the data center and a new substation would be constructed on the main facility site (see below). Additionally, the proposed data center would include up to three natural gas-fueled back-up power generators, either gas turbines or reciprocating engines (each retrofitted with carbon/greenhouse gas [GHG] capture technology), to provide the required redundant electrical power in the case of a full or partial loss of electrical service from the grid. The generators would each be rated at up to 10 megawatts (MW) and would be located within a generator plant building. Natural gas fuel for the generators would be supplied by an existing PG&E-owned natural gas pipeline that is located in the main facility site. New service connection to this natural gas pipeline would be installed as part of the project. It is expected that each generator would be operated for no more than 1,500 hours per year.

Substation

The data center would require up to 150 MW of electrical power and the desalination facility and other site infrastructure would require an additional 25 MW of electrical power. A redundant supply of electric power would require constructing a new 230-kilovolt (kV) substation with a footprint of approximately 137,000 square feet.

The substation and five transmission towers (ranging from 85 to 105 feet above grade) would be built on the main facility site and would be designed to interconnect with PG&E’s transmission system through the 230 kV high-voltage power lines that run through a corridor located on the main facility site. The interconnection and substation facilities would be designed to provide the redundant electrical power supply required to ensure power quality and reliability for operations. The preliminary design proposes an air-insulated substation enclosed in a metal structure so all conductors, instruments, switches, and breakers would be fully enclosed.

Product Water Conveyance

The DeepWater Desal proposal includes product water pipelines to supply three different areas: the Monterey Peninsula; Castroville and Salinas; and North Monterey and Santa Cruz Counties. It is assumed that up to an additional 25 miles of product water pipelines could be constructed to accommodate the product water that would not serve the Monterey Peninsula.

The desalinated product water would be delivered from the desalination plant site to the Monterey Peninsula via a 36-inch diameter pipeline. The pipeline would leave the desalination plant west along Dolan Road, south along Highway 1, south/southeast along Molera Road, southwest along Monte Road, to a connection point near the intersection of Monte Road, Lapis Road, and Charles Benson Road. The pipeline would then connect to the product water conveyance system described for the proposed project in Chapter 3, Description of the Proposed Project and shown on **Figure 5.4-3**.

Hydroacoustic Monitoring System

Alternative 3 would also include the construction and operation of a hydroacoustic monitoring system. The hydroacoustic information link (HAIL) monitoring system would allow for the collection of continuous water quality data for Project monitoring, and may also be useful for other research and/or academia needs that may be of interest pertaining to the Monterey Submarine Canyon. The system would repurpose an existing, abandoned Dynegy oil pipeline in Monterey Bay and consist of three primary components: transmitter(s), receiver; and, onshore processor. The transmitter would send low-rate hydroacoustic data to the receiver located at the end of the Dynegy pipeline. The onshore computer processor would receive the data from the receiver. The HAIL system would provide a reliable underwater data link for instruments located up to approximately 6 miles from the system receiver.

This component of DeepWater Desal’s application is not substantively related to the proposed project objectives or purpose and need and therefore, the hydroacoustic monitoring system and associated facilities are not analyzed in this EIR/EIS.

5.4.5.2 Construction

Open Ocean Intake System

The 42-inch-diameter dual intake pipelines would be constructed subsurface using HDD from the intake pump station site to the offshore seawater intake structure location in Monterey Bay. The installation of the pipelines would include anchoring in place and installation of ballast.

The HDD entry pit would be within the footprint of the intake pump station on Dolan Road. Prior to installation of the intake pipelines, the railroad spur and underlying embankment would be removed, and the site graded to the final elevation of the intake pump station.

The HDD segment of the intake pipelines would traverse subsurface along the north side of Dolan Road, cross under Highway 1, the Moss Landing Harbor Channel, and Moss Landing Sand

Spit within the discharge tunnel easement of the MLPP, and then to a point offshore where the pipelines would surface on the seafloor. The pipelines would also be at least 80 feet below the MLPP discharge pipe. Both intake pipelines would have similar elevations and would be separated by 10 to 20 feet along the alignment.

The HDD method uses a drill rig launched from an onshore location to drill a pilot bore to the intake structure location. The pilot bore would be enlarged by one or more back reamers to the size required for the intake pipe. It is assumed that the pipes would be assembled on barges, lowered to the seafloor and pulled back through the borehole during the final reaming process.

Construction of the intake structure would occur after installation of the pipelines has been completed. The bed of the intake structure may need to be prepared below the concrete pads. This would be accomplished using diver-assisted or lead dredging using suction and/or mechanical techniques. The amount of seafloor materials to be removed would depend on the local changes in bathymetric grade, but should be confined within the planned 120- by 50-foot area to accommodate the intake structure. Excavated materials would be transferred to a barge and disposed of in a suitable area onshore or offshore.

Embedment type anchors would be set into the seafloor to secure the concrete pads and would extend 10 feet below the seafloor. Given that sub-seafloor materials are soft, screw-type anchors would be installed and the intake structure would be placed on the seafloor. The entire assembly would be built off site and transported to the intake structure location, then lowered to the seafloor by crane and set into place by divers. Alternatively, the intake structure could be assembled in place by divers as needed using modular components that are fabricated off site then barged to the site. Once the intake structure has been installed, a prefabricated section of stiff or flexible pipe would be used to connect the intake structure to the sub-seafloor pipelines.

The 36-inch diameter transfer pipelines from the intake pump station to the desalination facility would be installed along the defined Dolan Road alignment within a conventional trench that is approximately 10 feet wide and 15 feet deep. Approximately 5 to 10 feet of cover would be provided between the top of the pipeline and roadway.

Brine Discharge Facilities

Installation of the five-jet linear diffuser would be similar to the intake structure since the diffuser structure would be supported on prefabricated concrete pads placed on the seafloor. The diffuser structure would be buried in riprap protective cover and ballast stone. The discharge pipelines would be constructed entirely subsurface except in the “breakout” location in the vicinity of the outfall structure on the shoulder of the Monterey Submarine Canyon. The same HDD pit used for the intake pipelines (within the intake pump station site) would be used to install the offshore portions of the discharge pipelines. Using conventional trench methods (as described above), the pipelines would be buried under Dolan Road between the desalination facility and the HDD site.

The onshore pipeline segments would be constructed of fiberglass-reinforced plastic or similar non-metal material onshore and high-density polyethylene (HDPE) or flexible polyvinyl chloride (PVC) for the offshore pipeline segments.

Desalination, Data Center, and Substation Construction

Construction of the data center, desalination facility, and substation on the main facility site would take approximately 2 years to complete. Activities would include site mobilization, demolition, site preparation and grading, paving for parking and access routes, trenching and backfilling for underground yard piping, excavation and installation of foundations, construction of all structures, interior finishing, equipment installation, testing, and commissioning. Construction equipment used would be very similar to equipment used for the proposed project, as listed in **Table 3-4** of Chapter 3, Description of the Proposed Project. Approximately 60 acres of land on the main facility site could be disturbed during construction. The remainder of the 110-acre main facility site is located within a PG&E easement across the site, which would be subject only to improvements related to the interconnections of the substation with the PG&E transmission system and existing natural gas pipeline.

Product Water Conveyance

The product water distribution systems would also involve site mobilization, site preparation and grading, trenching and backfilling for underground piping, and paving where pipeline alignments would be located in paved roads to the connection point with the proposed project conveyance system. Construction activities for the product water conveyance system would be the same as described for the proposed project in Section 3.3 of Chapter 3, Description of the Proposed Project in addition to the 25 miles of pipeline needed to serve Salinas and areas in Santa Cruz County.

5.4.5.3 Operation and Maintenance

Seawater Intake System

The intake system would operate 24 hours a day, 365 days a year. Redundant screens on the intake structure and the dual intake pipelines would allow for the intake system to operate continuously, even during maintenance activities.

Screen sections for the intake structure could be removed entirely for maintenance purposes when needed and the end of each intake pipe could be removed to facilitate cleaning or pigging. The intake screens would be manually cleaned by divers once per year, which would take two days to complete.

Dual-intake pipes are proposed to provide for system redundancy and to maintain source water flows during pipeline maintenance. One screen/pipeline could be out of service for maintenance while the other screen/pipeline system is in service. Annual pipeline maintenance would involve pigging to remove accumulated sediment and bio-growth. The pig has an abrasive coating that scrubs the pipeline walls, removing any buildup of ocean sediments, mineral deposits, and bio-growth.

Material removed during intake screen and pipeline maintenance would be released into the ocean at the screen location where manual screen cleanings are taking place or at the end of the intake pipeline where the pig is released. Wastes would not be disposed of elsewhere.

Brine Discharge Facilities

The brine discharge system would also operate 24 hours a day, 365 days a year. The dual discharge pipelines would allow for the discharge system to operate continuously even during routine inspections using closed-circuit television video. No other chemical- or mechanical-type cleaning system would be required.

Desalination Facility

The desalination facility would operate 24 hours a day, 365 days a year. The facility would be centrally operated from a computerized control system that would assist the facility staff in operating and monitoring the process equipment. The desalination facility would contain redundancy to facilitate periodic on-line maintenance of the individual treatment components with no reduction in facility output. However, approximately 18 days throughout the year, the facility could require reduced or no capacity for major maintenance or inspection purposes, such as those needed for State Water Resources Control Board, Division of Drinking Water Programs, compliance. This would result in an approximate annual plant availability of 95 percent, similar to the proposed project.

Chemical Storage and Use/Safety Procedures

Chemical use and storage would be similar to the proposed project (see Section 3.2.2.4 in Chapter 3, Description of the Proposed Project). Chemicals certified for use in drinking water treatment would be used in the desalination process to optimize pre-treatment filtration, ensure the correct water quality standards are met, and maintain the reverse osmosis membrane elements in a clean condition. Chemicals would also be used for stabilization and disinfection of the desalted product water to allow for distribution in a regulated potable water supply.

The chemicals would be delivered to the site in bulk quantities and stored in fully contained bulk storage tanks prior to use. All chemical storage, handling, and feed facilities would be designed, constructed, and maintained in compliance with all applicable governmental codes and regulations to ensure safe storage and handling.

Staffing

The desalination facility would be fully automated, but would be continuously staffed with a total of approximately 18 full-time employees spread over three shifts. Additionally, outside services would be required from electrical, equipment, and instrumentation contractors, and the service industry.

Data center core staffing would require 20 employees during each 8-hour shift. Additional contracted staff and client visitors could add up to an additional 20 people during any 8-hour shift. If required, staggering shifts to avoid peak-hour traffic times could be accommodated as most scheduled maintenance would take place during non-peak load times late at night, on weekends, or during holiday shutdowns to minimize disruption.

Solid Waste Generation

The proposed desalination facility would generate waste from the solids produced in the pre-treatment process. These solids would be settled, dewatered, and ultimately disposed of in a solid waste landfill or other approved land application method. Approximately 8.5 tons per day, or 3,102 tons per year, of sludge would be generated from the pre-treatment process and would be hauled off the site for disposal. The solids would contain naturally occurring organic and inorganic matter removed from the raw seawater during the pre-treatment process and precipitated iron from coagulation dosing with ferric chloride, if needed. Other solid wastes generated would include used cartridge filters generated during routine maintenance activities. Spent reverse osmosis membranes are non-hazardous waste and would be disposed of in a landfill. The administrative activities at the facility and the data center would generate typical office wastes.

Electrical Power Consumption

The operating desalination facility would consume 12 to 16 MW of electric power to provide for desalination facility, intake system, discharge system, and product water distribution system operation. The data center would require 150 MW of electrical power to operate.

Water Use and Wastewater Generation

Potable water would be required for the main facility site breakroom/kitchen and restrooms, which would result in the demand for 2,300 gallons per day of water. Potable water would be supplied via a new water line connection to an existing potable water line located in Dolan Road. Product water from the desalination facility would not be used on site for domestic purposes. Sanitary waste would be routed to the Castroville Community Services District for delivery to MRWPCA. Peak flows associated with the discharge of water from the closed-loop cooling system would be expected to occur once a year and would be approximately 588,000 gallons.

Stormwater Drainage

Stormwater detention ponds would be installed along the north side of the main facility site to provide approximately 3.6 acre-feet of water quality treatment. The ponds would be planted with native plantings.

Fencing, Access, and Parking

The main facility site is surrounded by a 7-foot-high chain-link fence. The perimeter of the desalination facility would be similarly fenced and would include three-strand barbed wire. Facilities within the main facility site perimeter, such as the electrical substation, could have additional fencing for both safety and security reasons. The main entrance for the facility site would be through the existing access via controlled automatic gates, located on the south side of the site at the western terminus of Via Tanques Road near its intersection with Dolan Road. A new secondary entrance would be located on the western side of the site off of Via Tanques Road. Two parking lots would also be installed at the main facility site, with a total of 158 spaces for employee and visitor parking.

Lighting and Landscaping

Outdoor area lighting for the main facility site would consist of permanently mounted fixtures secured to structures, equipment, walls, and poles as required, providing access lighting for personnel and for security. The lighting system would be designed to provide nighttime lighting levels consistent with applicable standards.

The landscaping plan for the main facility site includes planting tall native screening trees around the perimeter of the site and around major buildings. Low to medium-height native grasses and shrubs would also be planted.

Product Water Conveyance

The product distribution pipelines would likely be owned by the water agency purchasing water from the project; CalAm would own the pipelines to the Monterey Peninsula and others would own the pipelines to Salinas and Santa Cruz County. Annual flushing, valve operation, and system integrity inspection would be expected. Product water distribution system maintenance activities would be the same as for the proposed project (see Section 3.4.3 of Chapter 3).

5.4.5.4 Ability to Meet Project Objectives

Alternative 3 would meet all of the project objectives and would produce the required volume of product water, but its permitting complexity may delay the availability of the supply relative to the State Board's Cease and Desist Order. The alternative includes an open-water intake and the placement of ballast rock on the seafloor, and the desalination facilities would be co-located with a data center. The alternative would produce more water than is needed for CalAm's Monterey District and those contracts would need to be negotiated. An additional 6.5 miles of product water pipeline would be required to connect the alternative to the proposed project's pipelines in Marina; 25 additional miles of product water pipelines are also required to deliver water to other customers. DeepWater Desal would need to complete its own project-specific EIR/EIS process, develop mitigation for the impingement and entrainment losses associated with the open water intake, receive the required permits (including authorizations from MBNMS) and enter into a water purchase agreement with CalAm. The water purchase agreement would need to be approved by the CPUC prior to delivery of product water to CalAm's customers in the Monterey District service area. The increased permitting complexity may delay the ability to serve water to meet project objectives 1 through 7.

5.4.6 Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 is the People's Moss Landing Water Desalination Project (People's Project), which is proposed by Moss Landing Green Commercial Park, LLC (MLGCP). The People's Project will be evaluated in a separate EIR that is being prepared for the Moss Landing Harbor District as the CEQA Lead Agency. The Moss Landing Harbor District issued a Notice of Preparation[9] for the People's Project on June 25, 2015 (Moss Landing Harbor District, 2015). It is possible that a joint EIR/EIS will be prepared for the project, with MBNMS as lead federal agency, if a complete application is submitted to the Sanctuary.[10] For the purposes of this EIR/EIS, this project is considered as an alternative to the proposed project and the description herein is based on information received from MBNMS in June 2016. The evaluation of this alternative in this EIR/EIS is based on information that was publically available, information provided by MBNMS, and the independent judgement of the analysts based on the available information. More detailed analyses of the People's Project will be forthcoming in the separate environmental review document(s) and will be based on technical studies that were not available at the time this EIR/EIS was being prepared. The approach to analysis of the impacts of the People's Project in this EIR/EIS is based on available information, and draws conservative conclusions where information is currently unavailable.

5.4.6.1 Overview

Alternative 4 includes decommissioning the test slant well at CEMEX, and the construction and operation of an open ocean intake system, a 12 mgd desalination plant and associated components to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula area. The People's Project applicant has used CalAm's required need for replacement supplies and water needs of the General Plan Build-out to size this alternative. None of the project components would be the same as the proposed project except for the product water pipelines south of Neponset Road, at the point marked "connection to CalAm" on **Figure 5.4-4**. Alternative 4 would include the following new components:

- Open ocean intake system in the same vicinity as Alternative 3;
- Desalination plant including source water receiving tanks; pretreatment, reverse osmosis, and post-treatment systems; chemical feed and storage facilities and associated non-process facilities.
- Brine discharge system consisting of rehabilitating and extending an existing 51-inch diameter discharge pipeline; and

9 State Clearinghouse number 2015061103
10 The project proponent submitted permit application materials to MBNMS in October 2015 and the application was deemed incomplete. A revised application has not yet been submitted, as of October 2016.

SOURCE: ESA, 2015

205335.01 Monterey Peninsula Water Supply Project

Figure 5.4-4

Alternative 4 - Peoples' Moss Landing Water Desalination Project

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- All of the desalinated product water would be delivered from the desalination plant site to the Monterey Peninsula via a new 36-inch diameter pipeline. The pipeline would leave the desalination plant west along Dolan Road, then south along Highway 1, then south/southeast along Molera Road, then southwest along Monte Road, to a connection point near the intersection of Monte Road, Lapis Road, and Charles Benson Road. The almost 8-mile-long pipeline would then connect to the product water conveyance system described for the proposed project in Chapter 3, Description of the Proposed Project and shown on Figure 5.4-4.

As shown in **Figure 5.4-4**, the components of Alternative 4 would be located in the Moss Landing area of unincorporated Monterey County and offshore in the Monterey Bay. Each component is described below.

Open Ocean Intake System

The screened open ocean intake system in Monterey Bay would draw seawater for use as source water for the desalination plant. Approximately 30 mgd of source water would be needed to produce approximately 12 mgd of desalinated product water. The intake would use an existing 20-foot-diameter intake pump caisson structure located on the beach adjacent to the Monterey Bay Aquarium Research Institute on Sandholt Road in Moss Landing. The existing caisson was originally built in the 1940s and used as an open intake facility and pump house. The previous intake pipeline was removed and does not currently exist. The intake structure would be rehabilitated to include a new 40-inch diameter intake pipe that would extend approximately 1,400 feet out from the existing caisson into MBNMS. The near shore portion of the pipe (the first 300 feet) would be drilled under the seafloor and the remaining 1,100 feet would be laid on the seafloor and covered with riprap armoring.

Two wedgewire screens (one active and one stand-by) would be attached at the end of this new pipeline extension and would be located on the seafloor approximately 120 feet below mean sea level (msl). Each screen structure would be 96-inches in diameter, would be designed with 1.0 mm wedgewire slots for a maximum through-screen velocity of 0.5 feet per second and would be fabricated from copper nickel alloy to minimize the potential for biofouling.

A new 10-foot-high pump house would be built on top of the existing caisson structure with a first-floor elevation of approximately 17 feet above msl. Vertical turbine pumps would be used, with pumps submerged in the intake structure and motors in the pump house above. From the pump house, a new 40-inch diameter underground pipeline would convey the seawater under the island and beneath the Moss Landing Harbor and State Route 1 (or Highway 1) and deliver it to the proposed desalination plant at the Moss Landing Green Commercial Park.

Brine Discharge Facilities

An existing 2,750-foot outfall pipeline originates at the Moss Landing Green Commercial Park, goes under the marina and the marina parking lot island, under the commercial harbor, under the island, and extends approximately 800 feet from shore to a water depth of approximately 43 feet in Monterey Bay (Landmark Realty, 2011). The 51-inch-diameter concrete pipe is buried with approximately 25 feet of cover over the entire length (Miller, 2012). Due to the age and condition of the existing 51-inch-diameter pipeline, a new 36-inch-diameter pipeline would be slip-lined within the existing pipeline and extended approximately 700 feet on the seafloor to a water depth of approximately 120 feet at the edge of the submarine canyon (see **Figure 5.4-4**). The discharge would include two new 16-inch-diameter diffuser ports. Alternative 4 would discharge approximately 17.5 mgd of brine effluent with a maximum concentration of 62.5 ppt.

Desalination Facility (Moss Landing Green Commercial Park)

The desalination plant for Alternative 4 would be located at the Moss Landing Green Commercial Park, located on the southeast corner of Dolan Road and Highway 1. The approximately 200-acre site is zoned under the Monterey County General Plan for Heavy Industrial Coastal Dependent use. Of the total site, a 16.5-acre parcel is being proposed for developing the Alternative 4 desalination plant and would be fenced off from the rest of the property.

The desalination plant would include: (1) an equalization basin to receive and store the incoming source water; (2) an inlet pump station to convey source water from the equalization basin to a pretreatment system; (3) a pretreatment system; (4) a reverse osmosis system; (5) a post treatment system; (6) a return flow pipeline that would convey brine and washwater back to the disengaging basin; (7) chemical feed and storage facilities; and (8) facilities for residuals management. The desalination plant site would also contain a 5 million gallon treated water storage tank, as well as non-process administrative facilities.

Equalization Basin

The source water pipeline would terminate at a series of existing open top, partially buried, concrete storage tanks to serve as an equalization basin. The equalization basin would stabilize volume and temperature of the source water received from the intake facility prior to entering the desalination pretreatment process. The equalization basin would include rehabilitating two existing partially buried concrete open tanks to provide some equalization of the seawater, adequate retention time for coagulation of chemicals (as described below: *Pretreatment*) to react with the raw seawater to provide settling of large particulates and solids that may have made it through the passive screens. Each of these two tanks would have a capacity of 1.8 million gallons and plate settlers would be installed in the tanks to enhance sedimentation and settling. A coagulant dosing system would be used upstream of the contact tanks to inject chemicals such as ferric chloride into the seawater in order to improve the efficiency of downstream treatment processes. These tanks would be equipped with hopper bottoms for solid collection. A mechanical rotating sludge collector would be installed in each tank to remove deposited solids.

Inlet Pump Station

An inlet pump station would be located at the desalination plant and would pump raw seawater from the equalization basin to the pretreatment system. The pump station would be sized for a lift of approximately 30 feet and would have a capacity of 30 mgd.

Pretreatment System

The proposed pretreatment system would have a capacity of 30 mgd, and would consist primarily of flocculation, dissolved air flotation, media filtration, ultra-filtration, and cartridge filtration.

Reverse Osmosis System

The desalination plant would utilize a RO system similar to that described for the proposed project in Section 3.2.2.2 of Chapter 3, Description of the Proposed Project. The RO membranes would be housed in a new approximately 20,000 square-foot building. The system would utilize a “first pass” and partial “second pass” process to meet water quality requirements. Hardness, alkalinity, and pH of the product water would be adjusted after the RO process to meet water quality standards. Disinfection, as required to meet regulatory requirements, would take place using hypochlorite.

Byproducts and Residual Management

The following is a summary of the types and estimated quantities of byproducts and residuals produced at the proposed facility:

- Concentrate (brine) from the RO system. This stream would essentially have all the salts and ions present in the source water but at higher concentration. At the proposed RO recovery rate of 45 percent, the concentration of salts and ions would be 1.8 times that of seawater. At this recovery rate, the concentrate would contain total dissolved solids (TDS) in the range of 63,000 to 64,000 mg/L depending on the seawater temperature and salinity.
- Recovered and Treated backwash water from the Media Filters. The back wash water from the Media Filters and UF would be transferred to backwash collection tanks and pumped to the backwash treatment system consisting of sludge tank and centrifuges. The sludge would be collected and sent to a sludge treatment facility, while the clear supernatant would be mixed with the concentrate and sent to the outfall.
- Recovered and Treated Clean Backwash from Post Treatment. Similarly recovered clean backwash from post treatment would be mixed in the outfall blend tank and sent to the outfall. **Table 5.4-5** is a summary and expected quality of the combined outfall.

TABLE 5.4-5
OUTFALL WATER QUALITY AND QUANTITY

Product	Flow (MGD)	TDS (mg/L)
Concentrate (Brine) from RO	15.46	65,000
Recovered and Treated Backwash from Media Filtration	1.98	35,800
Recovered and Treated Clean Backwash from Post Treatment	0.06	400
Combined Total	**17.5**	**61,500**

- Clean-in-Place (CIP) Wastes. All three types of membranes used in Alternative 4 would require CIP systems. A CIP involves two steps: 1) circulating cleaning chemicals through the membranes; and 2) flushing the membranes with clean water to remove the waste-cleaning solutions. Neutralization systems would be included in the membrane facility with a neutralization tank placed under the building floor. The appropriate chemical, typically either sodium bisulfite acid or sodium hydroxide, would neutralize the cleaning chemicals so the waste can be properly sent to the sanitary sewer. A vertical chemical resistant pump would serve as mixing the chemicals as well as pumping the neutralized content of the tank gradually to the sewer system. The CIP events would be scattered throughout a week to reduce peak waste flows.

- Miscellaneous Wastes. Miscellaneous drains from analyzers, wash-downs, sample panels, etc., would be connected to the sanitary sewer system.
- Bathroom and Indoor Plumbing Wastes. Bathroom, showers and other building plumbing wastes would be connected to the sanitary sewer system. **Table 5.4-6** shows the estimated peak volumes and continuous flows to the sanitary system. A sewage pump station would be included adjacent to the desalination plant site and flow would be discharged into the Castroville Sanitation District sewer at the intersection of Dolan Road and Highway 1.

TABLE 5.4-6
OTHER RESIDUALS DISPOSAL

Residual	Total Volume per Event (gallons)	Frequency	Continuous flow (gpd)	Comment	To
RO CIP Cleaning	300,000	Once per month	50,000	Neutralized	Sanitary Sewer
BWRO Cleaning	80,000	Once every 2 months	20,000	Neutralized	Sanitary Sewer
Floor Drain, Analyzers, and Wash Waters	N/A	Continuous	3,000	Neutralized	Sanitary Sewer
Sanitary Sewer from Buildings and Offices	N/A	Continuous	1,500	Neutralized	Sanitary Sewer
Combined Total			74,500	Neutralized	Sanitary Sewer

- All process solid wastes would be combined and sent to the sludge tanks and sludge treatment facility. The sludge treatment would consist of sludge conditioning, centrifuges, thickeners, belt presses and chemical treatment for production of 30-35 percent solid content sludge, which would be sent off site by dump trucks. **Table 5.4-7** shows estimated volume of sludge to be hauled offsite.

TABLE 5.4-7
ESTIMATED SLUDGE PRODUCTION

Item	Units	Design
Dry Sludge Volume (30% Solids)	Gal/Day	407
Weight of Dry Sludge	Pounds/Day	4,070
Number of Hauling Trucks per Week		<2

Product Water Conveyance

Alternative 4 would include a 5 million gallon treated water storage tank at the desalination plant site, and a product water pipeline to connect to the CalAm Monterey District distribution system. The desalinated water would be delivered from the desalination plant site to the Monterey Peninsula via a new 8-mile-long, 36-inch-diameter pipeline that would proceed south along Highway 1, south/southeast along Molera Road, southwest along Monte Road, to a connection point near the intersection of Monte Road, Lapis Road, and Charles Benson Road. At this point, the new pipeline would connect to the product water pipelines described for the proposed project in Chapter 3, Description of the Proposed Project.

The People's Project would produce more water than is needed to meet the project objectives of the MPWSP. After meeting current customer demand of approximately 12,500 afy, the People's Project, in addition to existing supplies, would result in an excess of 6,000 afy for potential growth in the region.

5.4.6.2 Construction

Construction activities would take approximately 24 months and would include site grading and excavation; installation of prefabricated and onsite fabricated components (e.g., pretreatment and RO equipment, storage tanks, etc.); construction of buildings, electrical system, pump station and pipelines; and disposal of construction waste and debris. Construction equipment and materials associated with the open ocean intake system and desalination plant would be stored within the respective construction work areas. Construction equipment and materials associated with pipeline installation, including stockpiling of material, would be stored along the pipeline easements and at nearby staging areas. Staging areas would not be sited in sensitive areas such as riparian or critical habitat for protected species. To the extent feasible, parking for construction equipment and worker vehicles would be accommodated within the construction work areas and on adjacent public roadways complying with public parking signs.

Construction estimates are presented below in **Table 5.4-8**.

TABLE 5.4-8
ASSUMPTIONS FOR CONSTRUCTION ACTIVITIES

Alternative Components	Total Excess Spoils and construction Debris (Cubic Yards)	Construction Equipment	Construction Duration and Work Hours
Open Ocean/Bay Intake	150	Barge, Excavators, HDD Drilling Equipment, Dozers, Divers, Trucks	Overall schedule is approximately 6 months. Typical construction hours are from 7am to 4pm M-F.
Desalination Plant Facilities	40,000	Excavator, Backhoe, Grader, Crane, Dozer, Compactor, Trencher/Boring Machine, Front-end Loader, Water Truck, Flat-bed Truck, Forklift	Overall schedule is approximately 24 months. Typical construction hours are from 7 am to 4 pm - Monday through Friday
Outfall Pipeline and Diffuser	100	Barge, Excavators, HDD Drilling Equipment, Dozers, Divers, Trucks, etc.	Overall schedule is approximately 3 months. Typical construction hours are from 7 am to 4 pm - Monday through Friday
Product Water Pipeline	50,000	Excavator, Backhoe, Grader, Crane, Dozer, Compactor, Trencher/Boring Machine, Front-end Loader, Water Truck, Flat-bed Truck, Forklift, Compressor Jack Hammer, Asphalt Paver/Roller, Street Sweeper	Refer to proposed project in Chapter 3. Product water would be delivered to CalAm at Marina, then same as proposed project

Open Ocean Intake Pipeline

The existing caisson intake facility would be rehabilitated to withdraw the required 30 mgd of source water. Horizontal directional drilling or another trenchless technique would be used for the near shore portion of the new intake pipe (from caisson to approximately 300 feet offshore) and the remaining 1,100 feet of new pipe would be laid on the seafloor, ballasted with concrete collars and protected with riprap armoring. Two passive wedgewire screens would be mounted on a riser. Construction would require a combination of barges and scuba divers.

From the rehabilitated caisson and new pump house, a new 40-inch diameter pipeline would be installed using horizontal directional drilling methods to transfer the seawater to the desalination plant. The intake pipeline would be horizontally directional drilled under the Moss Landing Harbor and would then cross Highway 1 using pipe bursting methods to insert the new pipe into an existing 36inch pipeline crossing Highway 1. The pipe bursting process consists of advancing a conical-shaped bursting head that has a diameter 50 to 100 mm larger than the new replacement pipe, through the existing pipe. The product pipe immediately follows the bursting head as it is simultaneously pulled or pushed into the newly formed cavity.

Construction of the open ocean intake facility would be completed within approximately six months. During peak construction, five to ten construction workers may be employed.

Brine Discharge Pipeline

A new 36-inch diameter pipeline would be slip-lined within the existing 51-inch-diameter outfall pipeline. From the end of the existing outfall pipeline, 700 feet of new, 36-inch diameter pipeline would be laid on the ocean floor at a depth of approximately 120 feet below mean sea level and would include two 16-inch diameter diffuser ports. A combination of barges and scuba divers would be required to install the outfall extension on the ocean floor. The new outfall location would be at the same elevation as (120 feet below msl) and would be approximately 630 feet away from the open ocean intake.

Desalination Plant

Construction of the desalination plant and appurtenant facilities would include site preparation, equipment delivery, and building construction. Ground clearing and excavation of the site would be performed using heavy construction equipment such as bulldozers, backhoes, cranes, and graders. Heavy equipment would be used to construct connections with existing water conveyance systems, and to construct footings of tanks and other support equipment. Upon completion of excavation, construction activities would also include pouring concrete footings for tanks, laying pipeline and making connections, installing support equipment such as control panels and fencing the perimeter of the site.

Product Water Conveyance

Construction activities associated with the product water conveyance pipelines would be the same as described for the proposed project in Section 3.3.4 in Chapter 3, Description of the Proposed Project.

5.4.6.3 Operation and Maintenance

Open Ocean/Bay Intake Pipeline

The intake screens would be provided with an automatic airburst connection from a boat for occasional cleaning. A buoy would mark the spot of the screens to help avoid potential problems with boaters and anchoring.

Brine Discharge

The People's Project has not provided any information about the maintenance of the brine discharge system.

Desalination Plant

Chemical Feed and Storage Facilities

Various chemicals to be used during treatment would be stored and processed onsite, similar to the proposed project. The chemicals include:

- Coagulant (Ferric Chloride or Ferric Sulfate)
- Flocculant/Polymer/Filter Aid
- Sulfuric Acid
- Antifoulant
- Lime
- Caustic
- CO2
- Hypochlorite
- Ammonia
- Sodium Metabisulfite

The listed chemicals are non-flammable, and would be stored in tanks that meet applicable regulatory requirements and are located within the new pre-treatment, reverse osmosis and post-treatment building. The design of this building would incorporate the regulatory requirements for hazardous materials storage. In addition, two lime saturation tanks, situated adjacent to the chemical building, would contain a bed of calcite for post treatment after the RO process. Chemicals may be purchased in bulk and then processed on site.

Power Usage

Estimated power usage is between 8 and 9 kWh, assuming average water temperatures.

The primary source of electricity would be either direct service from Moss Landing Power Plant through an over-the-fence agreement with Dynegy, or from PG&E provided from an existing 12 kV electrical system. An independent secondary power supply (if available) or emergency backup generator would be required to operate the entire facility during power shortages. The emergency generator could run on diesel fuel or natural gas (preferred, if available).

Product Water Conveyance

Operation and maintenance activities associated with the product water conveyance facilities under Alternative 4 would be the same as under the proposed project.

5.4.6.4 Ability to Meet Project Objectives

Alternative 4 would meet all of the project objectives and would produce the required volume of product water, but its permitting process may delay the availability of the supply relative to the State Board's CDO. The alternative includes an open-water intake, a new discharge, and the placement of new pipeline and ballast rock on the seafloor. The alternative would produce more water than is needed for CalAm's current needs and the surplus would be available for growth in the region. An additional 6.5 miles of product water pipeline would be required to connect the alternative to the proposed project's pipelines in Marina. The People's Project would need to complete an EIR (and an EIS) process, develop mitigation (e.g., for the approximately 42,000 ft^2 of seafloor that would be covered in ballast rock and for the impingement and entrainment losses associated with the open water intake), receive the required permits and enter into a water purchase agreement with CalAm. The water purchase agreement would need to be approved by the CPUC prior to delivery of product water to CalAm's customers in the Monterey District service area. The increased permitting complexity may delay the ability to serve water to meet project objectives 1 through 7.

5.4.7 Alternative 5a – Reduced Project 6.4-mgd Desalination Plant *(Intake Slant Wells at CEMEX)*

5.4.7.1 Overview

This alternative is a variation of the proposed project, the implementation of which would be contingent upon the successful implementation of the Pure Water Monterey Groundwater Replenishment Project (GWR). As discussed in Section 1.1, Introduction, CalAm proposes to build a desalination plant with the capacity to produce up to 9.6 mgd of desalinated product water (proposed project), but also seeks authorization to reduce the size of the proposed plant to provide 6.4 mgd, and to purchase product water from the proposed GWR Project if it becomes clear that the GWR Project will be completed and on line in a timeframe that can supply water to meet the proposed project's purpose and needs (CalAm, 2016). Since the GWR Project was approved by the MRWPCA in October 2015, and the CPUC in September 2016 authorized CalAm to purchase 3,500 afy of the GWR supply for extraction from the Seaside Groundwater Basin, the GWR Project is assumed in the No Action alternative and analyzed as a project in the cumulative scenario for several of the alternatives, including Alternatives 5a and 5b. The GWR Project is described in Table 4.1-2 in Section 4.1 of Chapter 4, Environmental Setting (Affected Environment), Impacts, and Mitigation Measures, and a GWR Project Description is included in this EIR/EIS as Appendix H. Additional details on the GWR Project may be found in MRWPCA and MPWMD, 2016b.

Therefore, Alternative 5a includes the construction and operation of the reduced-capacity desalination plant capable of producing 6.4 mgd (compared with 9.6 mgd for the proposed project). Project components would be sited at the same locations as the proposed project and the only differences are the number of slant wells and the size of the desalination plant; all other facilities would be the same as for the proposed project. The GWR Project is addressed in the cumulative impacts analysis for this alternative.

Description of the Reduced Project

Figure 5.4-5 presents an overview of Alternative 5a. **Table 5.4-9** provides a detailed list of the facilities. Except for the number of slant wells (reduced to seven from 10) and the capacity of the desalination plant (reduced to 6.4 mgd from 9.6 mgd), the facilities are the same as described for the proposed project in Chapter 3, Description of the Proposed Project. Alternative 5a would include the following facilities:

- An intake system, which would consist of seven subsurface slant wells (five active and two on standby; these would consist of the converted test slant well and six new wells) located at the CEMEX site extending seaward of the mean high water line (MHWL) into MBNMS, and a source water pipeline.
- A 6.4 mgd desalination plant and appurtenant facilities, including source water receiving tanks; pretreatment, reverse osmosis (RO), and post-treatment systems; chemical feed and storage facilities; brine storage and facilities; and other associated non-process facilities.
- Desalinated water conveyance facilities, including pipelines, pump stations, and treated water storage tanks; same as the proposed project.
- An expanded ASR system, including two additional injection/extraction wells (ASR-5 and ASR-6 Wells), two parallel ASR Conveyance Pipelines to convey water to and from the ASR-5 and ASR-6 Wells, and an ASR Pump-to-Waste System; same as the proposed project.

Construction

Construction of Alternative 5a would be similar to the proposed project as described in Section 3.3 of Chapter 3, Description of the Proposed Project, and summarized in **Table 3-4**. The Alternative 5a facilities are expected to be constructed over approximately 24 months (same as the proposed project), from July 2019 through June 2021. See Section 3.3.10, Construction Schedule.

5.4.7.2 Operation and Maintenance

The Alternative 5a facilities would be operated in the same manner as for the proposed project (refer to Section 3.4, Operations and Maintenance).

Subsurface Slant Wells

Up to five subsurface slant wells would be operated at any given time, producing a combined total of up to 15.5 mgd of source water for the MPWSP Desalination Plant. Two wells would be maintained on standby. The existing test slant well would be converted into a permanent well.

6.4-mgd MPWSP Desalination Plant

The MPWSP Desalination Plant would utilize the 15.5 mgd of filtered source water to produce desalinated product water and approximately 9 mgd of brine. The 9 mgd of brine would be discharged out of the existing MRWPCA ocean outfall and diffuser into Monterey Bay, as described for the proposed project.

Castroville Pipeline

The 4.5-mile-long, 12-inch-diameter Castroville Pipeline (same as the proposed project) would convey desalinated water (Salinas Valley return flows) from the MPWSP Desalination Plant to the CSIP distribution system and the CCSD Well #3.

Pipeline to CSIP Pond

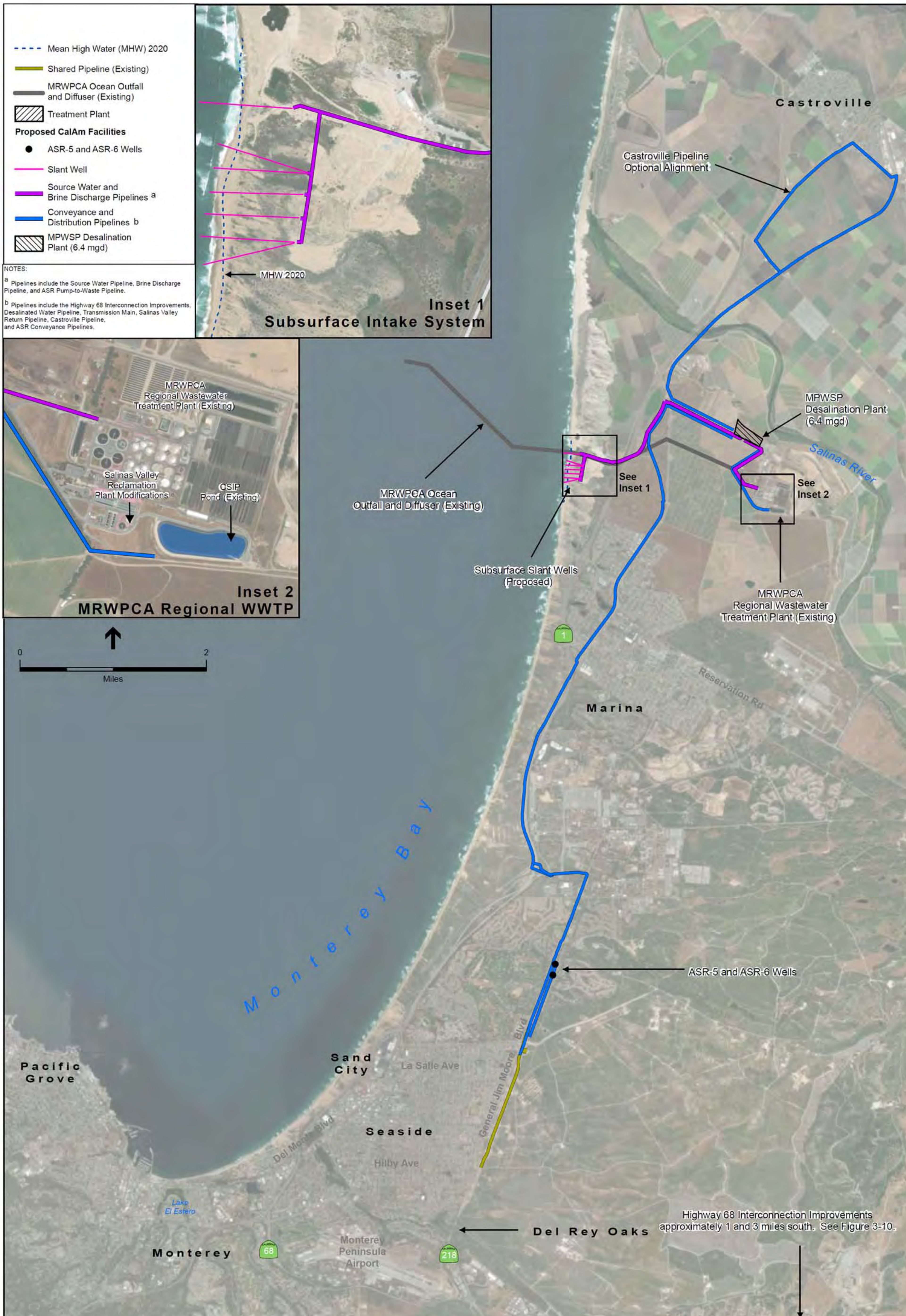
If the Castroville Pipeline is not built, CalAm would pump the Salinas Valley return water from the MPWSP Desalination Plant through a new 1.2-mile-long, 12-inch-diameter pipeline to the existing Castroville Seawater Intrusion Project pond at the southern end of the MRWPCA Regional Wastewater Treatment Plant. From the Castroville Seawater Intrusion Project pond, water would be delivered to agricultural users in the Salinas Valley through existing infrastructure.

Seaside Groundwater Basin ASR System

The Seaside Groundwater Basin ASR system would be operated in a similar manner as under the proposed project.

5.4.7.3 Ability to Meet Project Objectives

The implementation of Alternative 5a on its own and without the GWR project and associated water purchase agreement, would only partially meet the project objectives because the 6.4-mgd project would not develop enough supply to serve the existing land uses and water entitlements [12,845 afy] baseline or associated peak demands in CalAm's Monterey District. The 6.4 mgd desalination plant in combination with other existing sources (Carmel River legal entitlement, Seaside Basin, ASR, and Sand City Desalination) would achieve compliance with Order 95-10 and the Seaside Groundwater Basin Adjudication. However, Alternative 5a would not provide water supply reliability; and would not provide supply to fully serve Pebble Beach water entitlements or anticipated economic recovery at existing businesses. It would not provide enough supply to enable development of vacant legal lots of record. Assuming that the GWR Project is constructed (which is assumed in the cumulative analysis for this alternative), it would provide 3,500 afy of potable supply for the CalAm service area. Alternative 5a in combination with the GWR Project supply would meet the project objectives.



SOURCE: ESA, 2014

205335.01 Monterey Peninsula Water Supply Project

Figure 5.4-5

Alternative 5a - Intake Slant Wells at CEMEX

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TABLE 5.4-9
ALTERNATIVE 5A FACILITIES

Facility	Description
Intake System	
Subsurface Slant Wells (Construction technology is same as proposed project) Approximately 15.5 mgd of water drawn from beneath the ocean floor in MBNMS for use as source water for the desalination plant.	• Seven slant wells located at the CEMEX site, extending offshore beneath Monterey Bay (the conversion of an existing test slant well into a permanent well plus six new wells at five new well sites) into MBNMS, with up to five wells operating at any given time and two wells maintained on standby • The slant wells would be grouped into six well sites: three sites with one well each and two sites with two wells. Each well would have a wellhead and mechanical piping vault (meter, valves, and gauges); each well site would have one electrical enclosure, and one pump-to-waste basin (same as proposed project). • Well length, screens, pumps and concrete pads would be the same as described for the proposed project well sites 1 through 5.
Source Water Pipeline Conveys the combined source water from the slant wells to desalination plant.	• 2.2-mile-long, 42-inch-diameter pipeline • Two hydraulic surge tanks would be located near the collector pipe/Source Water Pipeline connection point, south of the CEMEX access road and inland of the dunes
Desalination Facilities	
Pretreatment System Would treat source water to remove suspended and dissolved contaminants	• Pressure filters or multimedia gravity filters would be housed within a 6,000-square-foot pretreatment building • Two 300,000-gallon backwash supply and filtered water equalization tanks • Two 0.25-acre, 6-foot-deep lined backwash settling basins with decanting system
Reverse Osmosis System Would remove salts and other minerals from pretreated source water	• Dual-pass RO system consisting of four active modules and one standby module, with each module producing 1.6 mgd of "permeate" (the purified water produced through the RO membrane) • UV disinfection system (if required) • The RO and post-treatment systems and chemical storage tanks would be housed within a 30,000-square-foot process and electrical building
Post-treatment System Would adjust the hardness, pH, and alkalinity of the desalinated product water and disinfect the water in accordance with drinking water requirements	• Chemical feed lines and injection stations (for carbon dioxide, lime, sodium hydroxide, phosphate-based corrosion inhibitor, and sodium hypochlorite)
Chemical Storage The capacity would range from less than 5,000 gallons to 20,000 gallons, depending on the treatment chemical	• Chemical storage tanks with secondary containment • Sumps and sump pumps
Administrative Building Would house restrooms, locker rooms, break rooms, conference rooms, electrical controls, laboratory facilities, equipment storage and maintenance, and electrical service equipment	• 4,000- to 6,000-square-foot building

TABLE 5.4-9 (Continued)
ALTERNATIVE 5A FACILITIES

Facility	Description
Brine Storage and Disposal Facilities	
Brine Storage and Disposal Brine concentrate produced during the RO process would be conveyed to the brine storage basin located at the MPWSP Desalination Plant before it is conveyed to the wastewater treatment plant for disposal into waters of MBNMS	• 3-million-gallon brine storage basin • 3,900-foot -long, 36-inch-diameter Brine Discharge Pipeline
MRWPCA Ocean Outfall Pipeline and Diffuser (existing) Would convey brine from the wastewater treatment plant to the existing ocean outfall pipeline in MBNMS, which terminates at a diffuser located offshore that would discharge the concentrate into Monterey Bay	• 2.3-mile long, 60-inch-diameter pipe (onshore portion) • 2.1-mile-long, 60-inch-diameter pipe (offshore portion) • 1,100-foot-long diffuser with 172 ports (129 ports are open and 43 are closed), each 2 inches in diameter and spaced 8 feet apart on alternating sides
Desalinated Water Conveyance and Storage Facilities	
Treated Water Storage Tanks Would serve as holding tanks from which water would be pumped to either the CalAm water system, the existing CSIP pond or the Castroville Pipeline.	• Two 103-foot-diameter, 1,750,000-gallon aboveground storage tanks (providing a total combined storage volume of 3.5 million gallons)
Desalinated Water Pumps Would pump desalinated product water to either the: 1) CalAm water system or; 2) CCSD and/or CSIP as Salinas Valley return flows	• Two 3.2 mgd capacity, 400-horsepower pumps and two 1.6 mgd capacity, 200-horsepower pumps to pump water through the Desalinated Water Pipeline to the CalAm water system • Two 1.4 mgd, 10-horsepower pumps to pump water through the Salinas Valley Return Pipeline CSIP Pond or the Castroville Pipeline to CCSD
New Desalinated Water Pipeline Would convey desalinated product water from the treated water storage tanks at the MPWSP Desalination Plant to the new Transmission Main at Reservation Road	• 3.3-mile-long, 36-inch-diameter pipeline
New Transmission Main Would convey desalinated product water between the Desalinated Water Pipeline at Reservation Road and ASR facilities at General Jim Moore Boulevard	• 6-mile-long, 36-inch-diameter force main
Carmel Valley Pump Station 500-square-foot facility that would provide the additional water pressure needed to pump through the existing Segunda Pipeline into Segunda Reservoir	• 3 mgd, 100 hp pump station

TABLE 5.4-9 (Continued)
ALTERNATIVE 5A FACILITIES

Facility	Description
Desalinated Water Conveyance and Storage Facilities (cont.)	
Castroville Pipeline Would convey desalinated product water from the MPWSP Desalination Plant to the Castroville Seawater Intrusion Project (CSIP) distribution system and the Castroville Community Services District (CCSD) Well #3 ● Product water would be delivered to the CSIP system via a new connection point located approximately halfway along the pipeline alignment at Nashua Road and Monte Road ● At the northern pipeline terminus, product water would be delivered to the CCSD at Del Monte Avenue and Merritt Street	4.5-mile-long, 12 inch-diameter pipeline extending from MPWSP Desalination Plant to Castroville (see **Figures 3-11** and **3-12**)
Pipeline to CSIP Pond Would convey desalinated product water from the MPWSP Desalination Plant to the CSIP pond for subsequent delivery to agricultural users in the Salinas Valley.	1.2-mile-long, 12-inch-diameter pipeline (see **Figure 3-5**)
Interconnection Improvements for State Route 68 Satellite Systems a) Ryan Ranch–Bishop Interconnection b) Main System–Hidden Hills Interconnection Would allow MPWSP supplies to be conveyed to the Ryan Ranch, Bishop, and Hidden Hills water systems	a) 1.1-mile-long, 8-inch-diameter pipeline b) 1,200-foot-long, 6-inch-diameter pipeline
ASR System	
Six ASR Injection/Extraction Wells (four existing wells and two proposed): ● ASR-1 and ASR-2 Wells (existing) ● ASR-3 and ASR-4 Wells (existing) ● ASR-5 and ASR-6 Wells (proposed) Would be used to inject Carmel River supplies and desalinated product water into the Seaside Groundwater Basin for storage; during periods of peak demand, would be used to extract the stored water for delivery to customers	● Two proposed 1,000-foot-deep injection/extraction wells (ASR-5 and ASR-6 Wells) with a combined injection capacity of 2.2 mgd and extraction capacity of 4.3 mgd ● Four existing injection/extraction wells (Phase I and II wells)

TABLE 5.4-9 (Continued)
ALTERNATIVE 5A FACILITIES

Facility	Description
ASR System (cont.)	
ASR Pipelines: 1. ASR Recirculation Pipeline 2. ASR Conveyance Pipeline 3. ASR Pump-to-Waste Pipeline ASR Recirculation pipeline would be used to convey water from existing conveyance pipelines and infrastructure at Coe Avenue and General Jim Moore Boulevard to the new ASR-5 and ASR-6 Wells for injection ASR Conveyance Pipeline would be used to convey extracted ASR water supplies to the existing infrastructure at Coe Avenue/General Jim Moore Boulevard ASR Pump-to-Waste Pipeline would convey backflush effluent produced during routine maintenance of the ASR-5 and ASR-6 Wells to the existing Phase I ASR settling basin.	● Three parallel 0.8-mile-long, 16-inch-diameter pipelines

5.4.8 Alternative 5b – Reduced Project 6.4-mgd Desalination Plant (*Intake Slant Wells at Potrero Road*)

5.4.8.1 Overview

This alternative, like Alternative 5a, is a variation of the proposed MPWSP, the implementation of which would be contingent upon the successful implementation of the GWR Project. Furthermore, Alternative 5b (**Figure 5.4-6**) is similar to Alternative 5a described above, except that the intake slant wells would be located at the Potrero Road site (same as Alternative 1 but fewer wells) instead of at the CEMEX site. Alternative 5b therefore, includes the decommissioning of the test slant well at CEMEX, and the construction and operation of the reduced-capacity desalination plant capable of producing 6.4 mgd (compared with 9.6 mgd for the proposed project), with the intake wells at Potrero Road. The effects of Alternative 5b in combination with the GWR project are discussed in the evaluation of cumulative impacts.

Only the following facilities would be different from Alternative 5a (refer to Section 5.4.7 for a description of other facilities):

- An intake system consisting of seven subsurface slant wells (five active and two on standby at any given time) located at the Potrero Road site (described in Alternative 1) extending 220 to 535 feet offshore into MBNMS.
- A 42-inch-diameter source water pipeline as described under Alternative 1 would connect the slant wells to the 6.4 mgd desalination plant at the Charles Benson Road site.

5.4.8.2 Construction

Construction methods for the intake wells and source water pipeline would be similar to those described for Alternative 1 except that only seven intake wells would be needed (five active and two on standby). The source water pipeline alignment would be the same as described under Alternative 1. All other components (i.e., desalination plant, brine discharge, ASR and product water pipelines) would be the same as described under Alternative 5a.

5.4.8.3 Operation and Maintenance

Operation and maintenance requirements would be the same as described under Alternative 5a.

5.4.8.4 Ability to Meet Project Objectives

Just like Alternative 5a, the implementation of Alternative 5b alone, without the GWR Project, would not meet project objectives because the 6.4 mgd project would not produce enough supply to meet the annual or peak demands in CalAm's Monterey District. Similar to Alternative 5a, this alternative would meet all project objectives if the GWR Project is operational and able to deliver water to CalAm.

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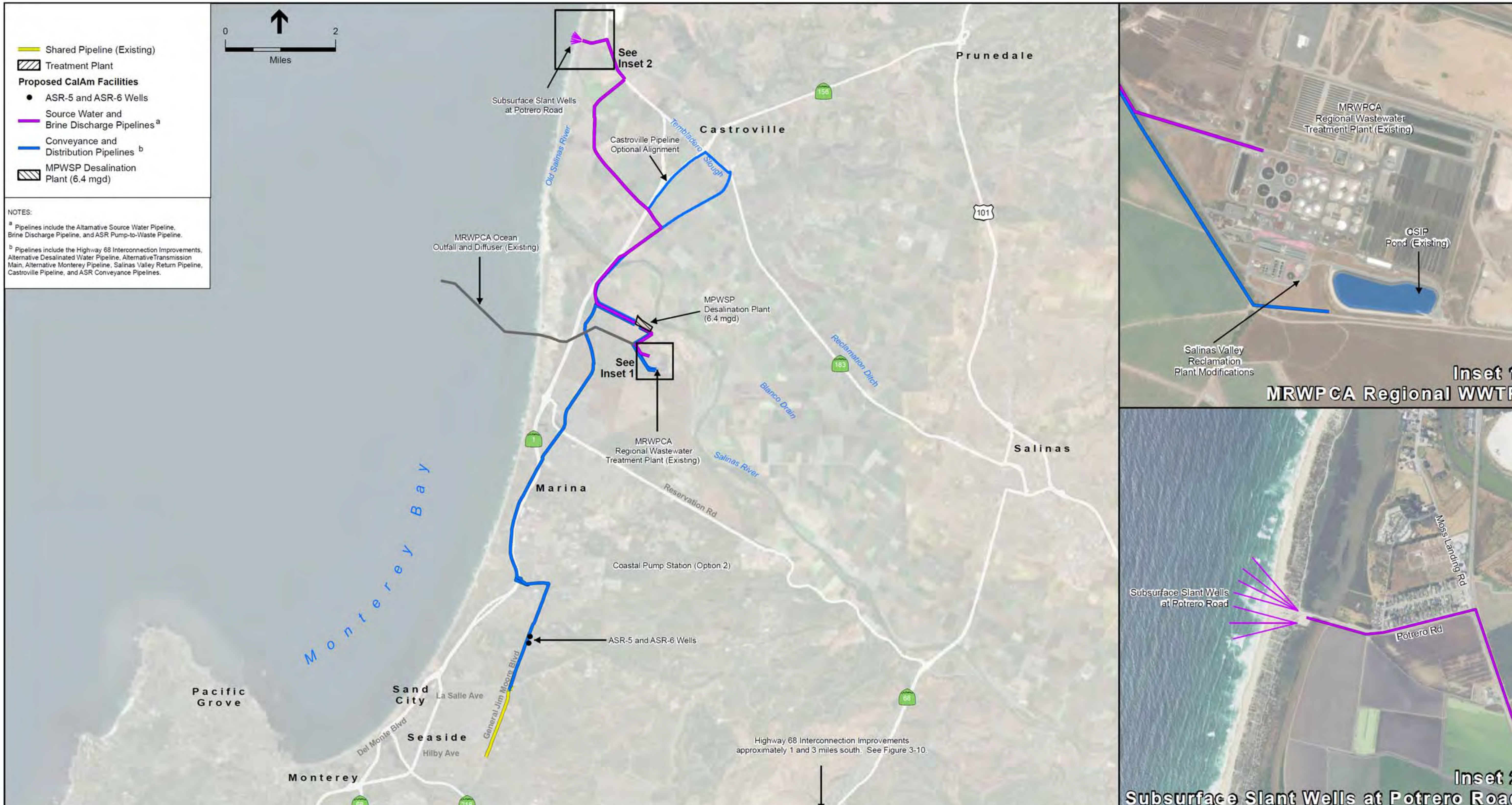

SOURCE: ESA, 2015

205335.01 Monterey Peninsula Water Supply Project

Figure 5.4-6
Alternative 5b - Intake Slant Wells at Potrero Road

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5.5 Alternatives Impact Analysis

Sections

Tables

Figures

Figures

5.5.1 Overview

This section evaluates the comparative environmental impacts of the alternatives that are described in detail in Section 5.4 of this EIR/EIS, including the “No Project” (No Action) Alternative. Section 5.6 presents the comparative environmental impacts in summary tables. Text in this Section 5.5 is intended to be reviewed with the comparative tables in Section 5.6 that provide a summary for each relevant significance criterion.

Information about each alternative, including the No Project alternative, is provided to facilitate a meaningful evaluation, analysis, and comparison of alternatives with the proposed project, including those not within the jurisdiction of the lead agencies. A description of the CEQA and NEPA guidelines related to alternatives evaluations is included in Section 5.1.1. The analyses that follow in this section present the same topical areas, and in the same order, as those presented in Chapter 4 of this EIR/EIS. Each section includes the following:

- **Setting/Affected Environment** – Baseline information is provided for those resources where the study area for alternatives is different from the proposed project’s study area. For most issue areas, the proposed project onshore study area is south of the intersection of Nashua Road and Highway 1. Several alternatives have locations in areas north of the intersection of Nashua Road and Highway 1, or in Moss Landing. Reference is made to the setting for the proposed project in Chapter 4 where the setting/affected environment is the same.

- **Direct and Indirect Effects** – A brief recap of the proposed project effects described in detail in Chapter 4 is provided for the reader’s convenience. An analysis of each alternative is then provided, starting with the No Project Alternative, followed by Alternatives 1 through 5a and 5b. While providing impact conclusions required by CEQA and NEPA, the analyses focus on the differences in impacts of each alternative compared to the proposed project. Similar to the impact analysis in Chapter 4, each of the alternatives is evaluated using the following primary analysis categories:

  - Construction Impacts
  - Operational and Facility Siting Impacts
  - Cumulative Impact Analysis (refer to Section 4.1 and **Table 4.1-2** for a description and list of projects considered in the cumulative scenario)

  Within each analysis category, the impacts are summarized in the text. For specific impact statements that correspond to individual significance criteria, see the comparative tables in Section 5.6.

Reference is made to analysis in Chapter 4 for impacts that would be the same as, or similar to, the impacts of the proposed project. Each of the alternatives shares some components of the proposed project, and the impacts for those shared components would be the same as the proposed project. For instance, Alternative 1 shares all project components except the location for the slant wells, and has an additional 5.5 miles of source water pipeline to connect the slant wells at the alternative location to the desalination plant. In each resource section, the impact analysis for the shared components is in the corresponding resource section in Chapter 4, and the conclusions by resource are also summarized in 5.6. The impacts for each alternative incorporate the combined impacts of the shared and different components into the overall analysis and impact conclusion for each resource and accounts for any synergistic or accumulative impacts from all components.

Where applicable, mitigation measures that are applied to the proposed project in Chapter 4 are applied to potentially significant impacts of the alternatives. When an alternative's impact is determined to be increased in severity compared to the significant impact of the proposed project, that conclusion is being drawn from the information about the alternative that was available at the time this EIR/EIS was being prepared. In some circumstances, further analysis and technical studies could conclude that the impact could be mitigated to a less-than-significant level. In those instances, however, until such time as that information is developed and made available, the impact is declared to be significant and unavoidable.

The analysis of each alternative identifies a significance conclusion for each evaluation criterion, based on comparison to the affected environment or no action condition[1], and discusses the severity of impact compared to the proposed project. Impact significance determinations include No Impact (NI), Less than Significant (LS), Less than Significant with Mitigation (LSM), and Significant and Unavoidable (SU). For purposes of CEQA, the impacts of the alternatives compared to those of the proposed project are described using the following terms:

- ***Same impact conclusion*** – impacts would be identical to those of the proposed project or would be of the same general magnitude such that the level of significance does not change (e.g., for both the proposed project and the alternative, the impact is less than significant);
- ***Increased impact conclusion*** – impacts would be notably greater than the proposed project such that the level of significance is increased (e.g., from less than significant to less than significant with mitigation); or
- ***Reduced impact conclusion*** – impacts would be notably less than the proposed project such that the level of significance is reduced (e.g., from less than significant to no impact).

[1] The purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project (see Section 15126.6(e)(1) of the CEQA Guidelines). Pursuant to NEPA regulations (40 CFR 1502.14) the EIS "should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public" and Section 1502.14(d), which requires that the alternatives analysis in the EIS "include the alternative of no action."

Finally, all of the projects that could contribute to cumulative impacts are listed in **Table 4.1-2**. The projects in Table 4.1-2 have occurred[2] or are anticipated to occur in the reasonably foreseeable future within the study area. Of those projects, the water supply projects that are included within the cumulative scenario for each alternative are described with additional detail in Section 4.1.7.2 and summarized below in **Table 5.5-1** for purposes of clarification. In summary, the Proposed Project, Alternatives 1, 2, and 4 are designed to meet the full project objectives and assume that GWR would not be operational, and as such, GWR is not considered in the cumulative impacts scenario for those alternatives. Whereas the reduced capacity option reflected in Alternative 5a and 5b assumes that GWR would be operational, and GWR is considered in the cumulative impacts scenario. GWR is also considered in the cumulative impacts scenario for the No Project Alternative, as CalAm intends to purchase 3,500 acre-feet/year (afy) from the GWR Project under this alternative. The project proponent for Alternative 3, DeepWater Desal, intends to serve Santa Cruz County and Salinas even if other alternatives, and/or the GWR Project are implemented, and as such, GWR is assessed in the cumulative scenario for this alternative, and for the same reason, Deepwater Desal is considered in the cumulative scenario for all other action alternatives.

TABLE 5.5-1
WATER SUPPLY PROJECTS RELEVANT TO THE CUMULATIVE SCENARIO FOR EACH ALTERNATIVE

	Cumulative Water Supply Project		
Alternative	**DeepWater Desal Project (No. 34)**	**People's Project (No. 57)**	**Pure Water Monterey Groundwater Replenishment (GWR) Project (No. 59)**
No Project Alternative	No	No	Yes
Proposed Project	Yes; serving Santa Cruz County and Salinas	No	No
Alternative 1: Slant Wells at Potrero Road	Yes; serving Santa Cruz County and Salinas	No	No
Alternative 2: Open-Water Intake at Moss Landing	Yes; serving Santa Cruz County and Salinas	No	No
Alternative 3: Monterey Bay Regional Water Project (DeepWater Desal)	N/A	No	Yes; serving Monterey District with 3,500afy. If this occurs, Alternative 3 would serve the Monterey District with 6.4 mgd instead of 9.6 mgd, and would serve Santa Cruz County and Salinas with the balance.
Alternative 4: People's Moss Landing Water Desalination Project (People's Project)	Yes; serving Santa Cruz County and Salinas	N/A	No
Alternatives 5: Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)	Yes; serving Santa Cruz County and Salinas	No	Yes; serving Monterey District with 3,500 afy.

[2] While a cumulative analysis includes past, present and reasonably foreseeable future projects, the category of past projects is captured within the existing setting, or baseline, against which impacts are judged throughout the EIR/EIS, including the cumulative analysis. However, where projects were implemented after 2012 (the baseline year), those projects are set forth within Table 4.1-2 and included in the cumulative analysis.

5.5.2 Geology, Soils, and Seismicity

The evaluation criteria for Geology, Soils, and Seismicity address: erosion and loss of topsoil; exposure of people or structures to effects of fault rupture, seismically-induced groundshaking, ground failure, or landslides; expansive or corrosive soils; subsidence; soils incapable of supporting alternative wastewater systems; coastal erosion/dune retreat; and the potential to degrade marine geologic resources or oceanographic processes. The study area is susceptible to seismic activity, but none of the components intersect active faults. Components proposed near the shoreline are susceptible to coastal erosion.

5.5.2.1 Setting/Affected Environment

The regional geologic setting and general information on seismicity, faults, geologic hazards and seismic hazards in Section 4.2, Geology, Soils, and Seismicity, would apply to the alternatives. Components of the alternatives similar to the proposed project located south of the Nashua Road/Highway 1 intersection would occur within the same local geologic, soils, and seismic setting as that presented in Section 4.2 and the reader is referred to that section for a detailed description. For components unique to the alternatives that are located north of the Nashua Road/Highway 1 intersection, the local geologic setting is presented below.

Local Geology and Seismicity

North of the Nashua Road/Highway 1 intersection, pipeline alignments for the alternatives would extend within or alongside segments of Molera Road, Highway 1, Potrero Road, and Dolan Road in unincorporated Monterey County and occur adjacent to active farmland. The pipelines would be located mostly on Quaternary floodplain (Qfl) and basin (Qb) deposits (see far northern coastal area on **Figure 4.2-1**, Geologic Map of Project Area). The Moss Landing area is also mostly on floodplain and basin deposits with some of the Dolan Road area on marine terrace (Qmt) deposits. No active faults pass through this area and the nearest active fault is the San Andreas Fault Zone, about 12 miles to the northeast (see **Figure 4.2-4**).

Soil Properties

Most of the components of the alternatives would be constructed in developed areas with disturbed ground consisting of an indeterminate mix of fill materials and underlying native sandy loam soil. The location for the Alternative 3 desalination facility is on soil composed mostly of Santa Inez fine sandy loam with some Diablo Clay (NRCS, 2015). The locations for pipelines that would be built on or under the seafloor within Monterey Bay are further characterized in Section 5.5.4, Marine Biological Resources.

The soil properties of linear extensibility (shrink-swell or expansion), corrosion of unprotected concrete, and corrosion of unprotected steel are defined in Section 4.2. The following alternatives' components would be located on expansive soils with a high potential for corrosion of steel: the eastern portion of the parking lot at Potrero Road and the portion of Potrero Road between Alisal Slough and Laguna Road where pipelines would be constructed for Alternatives 1 and 5b, and the desalination facility in the Moss Landing area for Alternative 3. The alternative components in the Potrero Road and Moss Landing area would not be located on soils with a high potential for corrosion.

5.5.2.2 Direct and Indirect Effects of the Proposed Project – Slant Wells at CEMEX

As described in detail in Chapter 3, Description of the Proposed Project, the proposed project (see **Figure 3-2**) would include construction of a desalination plant on 25 acres along Charles Benson Road northeast of the City of Marina that would create approximately 15 acres of impervious surfaces, up to nine new subsurface slant wells at the CEMEX active mining area, and conversion of the existing test slant well to a permanent well. The proposed project would also include improvements to the existing Seaside Groundwater Basin aquifer storage and recovery (ASR) system facilities, pump stations, storage tanks, and about 21 miles of new water conveyance pipelines. No construction or placement of facilities on the seafloor would occur.

The following paragraphs briefly summarize the impacts of the proposed project with respect to geology, soils, and seismicity. The detailed impact analysis of the proposed project is provided in Section 4.2.

Impact 4.2-1: Soil erosion or loss of topsoil during construction.

Project construction would involve localized, short-term ground disturbance activities (e.g., grading, excavation, trenching, and drilling). The potential for soil erosion during construction activities would be minimal because project facilities and all conveyance pipelines would be located in relatively flat areas with little topographic relief. Furthermore, project construction activities would be subject to compliance with the state Construction General Permit, the Monterey County Grading Ordinance, and Monterey County Erosion Control Ordinance, which would require the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) and best management practices (BMPs) that would reduce or prevent soil erosion that ensure erosion is minimized. Therefore, soil erosion impacts would be less than significant for all project components.

Grading, excavation, and backfill activities in vegetated areas, including sensitive natural vegetation communities as well as agricultural lands, could result in the loss of topsoil. For the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline, ASR-5 and ASR-6 Wells, and the Carmel Valley Pump Station, the impact would be potentially significant due to the presence of a well-developed topsoil horizon and the potential for it to be lost during excavation and backfilling. The impact associated with topsoil loss would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.6-2b** (**Avoid, Minimize, and Compensate for Construction Impacts on Sensitive Communities**) and **4.16-1** (**Minimize Disturbance to Farmland**). These measures require that topsoil be salvaged, stockpiled separately from subsoils, and returned to its appropriate location in the soil profile during backfilling activities. Surface soils at the slant wells and MPWSP Desalination Plant site are sandy and do not have a well-developed soil horizon and there are no sensitive natural communities or crop production. The pipelines and interconnection improvements south of

Reservation Road would be constructed within existing roadways and highly disturbed areas and would have no effect related to the loss of topsoil. Therefore, construction of the subsurface slant wells, MPWSP Desalination Plant and pipelines and interconnection improvements south of Reservation Road would have no impact related to loss of topsoil.

Impact 4.2-2: Exposure of people or structures to substantial adverse effects related to fault rupture.

Faults mapped as inactive by the State of California because they do not display evidence of recent displacement, intersect the proposed new Transmission Main, and the Ryan Ranch-Bishop Interconnection Improvements. This impact would be less than significant, and no impact would result for all other components of the proposed project.

Impact 4.2-3: Exposure of people or structures to substantial adverse effects related to seismically induced groundshaking.

Monterey County will likely experience a large regional earthquake within the operational life of the MPWSP. However, because of the location of project facilities relative to the faults and the limited potential for ground surface rupture associated with these faults, the potential is low for the groundshaking to cause injury, loss of life, or substantial property damage. Completion of a comprehensive geotechnical investigation, adherence to the current building ordinances, and the application of standard engineering practices would ensure that structures are designed to withstand seismic events without sustaining substantial damage or collapsing. This impact would be less than significant.

Impact 4.2-4 Exposure of people or structures to substantial adverse effects related to seismically induced ground failure, including liquefaction, lateral spreading, or settlement; Impact 4.2-5 Exposure of people or structures to landslides or other slope failures.

The potential for ground failure[3] is higher in areas composed of granular soils with a shallow depth to groundwater. The Castroville Pipeline and the Source Water Pipeline would be located on soils with a moderate to high potential for liquefaction; the Carmel Valley Pump Station would be located on soils mapped with a moderate liquefaction potential. The other project components would not be located in areas susceptible to liquefaction-induced ground settlement. Only the Main System-Hidden Hills Interconnection Improvements (consisting of a 100-foot-long, 6-inch-diameter buried pipeline) would be located in an area characterized as having a moderate to high susceptibility to earthquake-induced landslides. There are no existing active landslides in the area and the project does not propose activities that would exacerbate an otherwise unstable slope condition. The impact from seismically induced ground failure would be less than significant for all components of the proposed project due to required engineering practices and construction methods.

3 Ground failure includes liquefaction, lateral spreading, or settlement, which would cause the foundation of a structure to be damaged, or pipelines to rupture.

Impact 4.2-6, 4.2-7: Exposure to expansive or corrosive soils.

Unless properly removed or reconditioned, expansive soils (such as clay loam, fine sandy loam, or loamy fine sand) could exert additional pressures on foundations and below-grade facilities, which could lead to pipeline rupture or structural damage. Soils with a high conductivity can corrode unprotected underground metal pipes, electrical conduits, and concrete, which could lead to pipeline failure. Proposed components that would be placed on or in soils with potential for moderate to high expansion potential include the Castroville Pipeline, Carmel Valley Pump Station, the Main System-Hidden Hills Interconnection Improvements, and the Ryan Ranch–Bishop Interconnection Improvements. Project components that would be on or in soils with moderate to high corrosion potential include the MPWSP Desalination Plant, ASR-5 and ASR-6 Wells, ASR Pipelines, and the Ryan Ranch–Bishop Interconnection Improvements. The structural elements would be required to undergo appropriate design-level geotechnical evaluations prior to final design and construction. If expansive and/or corrosive soils are identified during the final geotechnical design study, the project geotechnical engineer would recommend remedies to eliminate damage from expansive and corrosive soils, and those industry-standard recommendations would be implemented, including avoidance and/or removal of expansive and corrosive soils, or the use of cathodic protection. Given all of the existing building requirements and standards, the potential for expansive or corrosive soils to adversely impact project components is low and these impacts are less than significant.

Impact 4.2-8: Exposure of people or structures to substantial adverse effects related to land subsidence.

Overdrafting (long-term withdrawal in excess of recharge) of the Salinas Valley Groundwater Basin has taken place over an extended time, and saltwater has replaced the freshwater in those affected areas, thereby preventing subsidence. The proposed slant wells would be screened in aquifer units composed predominantly of sand and gravel which are less prone to subsidence because of their granular structure. Seawater would replace the water pumped from the slant wells and the continuous replacement of water would keep the pore spaces between the grains filled with water, further supporting the granular structure. Consequently, the soil structure above the slant wells would be unable to subside as a result of pumping and there would be no impact from subsidence associated with the subsurface slant wells.

The proposed ASR-5 and ASR-6 Wells would be located about 1,000 feet below ground surface in the sandstone portions of the Santa Margarita Formation in the Seaside Groundwater Basin. The sandstone structure would be expected to support the granular structure during groundwater pumping, especially considering the depth. Furthermore, for the first 25 years of the proposed project, 700 acre-feet annually would be left in the Seaside Groundwater Basin to restore water extracted in years prior to this project. This means that the overall groundwater levels in the Seaside Groundwater Basin would increase as a result of the proposed project, thus decreasing the potential for subsidence and resulting in no subsidence impacts.

Impact 4.2-9: Have soils incapable of supporting the use of alternative wastewater disposal systems.

The construction of the subsurface slant wells and the ASR wells would require the disposal of water from well drilling and development. The high permeability of the sandy materials at the proposed locations would be suitable for the infiltration of water and the impact would be less than significant. For all other project components, there would be no impact.

Impact 4.2-10: Accelerate and/or exacerbate natural rates of coastal erosion, scour, or dune retreat, resulting in damage to adjoining properties or a substantial change in the natural coastal environment.

The Monterey Bay coastline is expected to retreat due to rising sea level and would result in a beach and surf zone that is inland of its current location. Under a conservative predicted erosion rate, the proposed slant wells would not become exposed during their operational life (anticipated to be 20 to 25 years) and would not contribute to further coastal erosion or changes in the beach environment. However, it is possible that the existing test slant well (that would be converted to a permanent well) might become exposed on the beach during its operational life. If exposed, the subsurface slant well could accelerate and/or exacerbate natural rates of coastal erosion, scour, and dune retreat that could alter the natural coastal environment. The anticipated future presence of this slant well on the beach due to coastal retreat could result in a significant impact. **Mitigation Measure 4.2-9** (**Slant Well Abandonment Plan**) would reduce the impact to a less-than-significant level by requiring CalAm to monitor coastal retreat rates and initiate well decommissioning if coastal retreat threatens the slant wells.

Impact 4.2-C: Cumulative impacts related to geology, soils, and seismicity.

Proposed project construction would not have a significant contribution to cumulative erosion-related impacts. Project operations would not have a significant contribution to cumulative effects associated with fault rupture, seismic ground shaking, ground failure, landslides, or expansive/corrosive soils. Cumulative effects on topsoil could be significant, but the proposed project's potentially significant contribution to this impact would be reduced to a level that is less than significant with implementation of mitigation measures identified in Impact 4.2-1. Similarly, although cumulative impacts related to coastal erosion could be significant, implementation of the mitigation measures identified in Impact 4.2-10 would reduce the proposed project's contribution to cumulative coastal erosion impacts to less than significant.

5.5.2.3 Direct and Indirect Effects of No Project Alternative

Under the No Project Alternative, no new facilities would be constructed and the test slant well would be decommissioned. Consequently, there would be no ground disturbance or placement of new structures that could affect or be affected by soils or seismic activity, and thus no construction- or operation-related direct or indirect impacts relative to geology, soils, and seismicity associated with the No Project Alternative. Because the No Project Alternative would have no direct or indirect impacts with respect to geology, soils, and seismicity, it could not contribute to cumulative effects related to these topics.

5.5.2.4 Direct and Indirect Effects of Project Alternative 1 – Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.4.3). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**). Therefore, the geologic impact analysis of Alternative 1 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 1.

Construction Impacts

All construction activities and disturbance for the slant wells would occur in the parking lot at the western terminus of Potrero Road in northern Monterey County, near the southern border of the unincorporated community of Moss Landing. The Potrero Road beach parking lot is owned and operated by the California Department of Parks and Recreation (California State Parks) and the 10 slant wells would be buried 5 feet below the hardened sand parking surface. The approximately 4-foot-wide, 12-foot-long, and 6-foot-high electrical control building, the only above-ground structure at this location, would be located at the edge of the parking lot.

Slant well construction, using similar materials, pipe sizes, and construction methods to those described for the proposed project, would occur year-round at the Potrero Road parking lot. Construction of the slant wells would require short-term ground disturbance activities (e.g., grading, excavation, drilling, and the construction of structures) and the entire 1-acre parking lot would be closed during construction. The potential for erosion would be reduced from the 9 acres of disturbed area at CEMEX and construction at Potrero Road would not disturb the dunes or active beach area. The slant wells would be located in relatively flat areas with little topographic relief, which would minimize the potential for soil erosion during construction.

The 36-inch diameter source water pipeline for Alternative 1 would be constructed within Potrero Road and would continue south along Highway 1, then south/southeast along Molera Road, and southwest along Monte Road to the desalination plant site on Charles Benson Road (**Figure 5.4-1**). The construction of an additional 5.5 miles of source water pipeline could increase the potential for erosion compared to the proposed project. However, construction of both the slant wells and pipeline would be required to comply with the numerous existing State and local regulations described in Impact 4.2-1 that would reduce or prevent soil erosion. Thus, combining the impacts of the proposed project components with the addition of 5.5 miles of source water pipeline and the slant wells at Potrero Road, construction would result in the ***same impact conclusion*** as the proposed project, less than significant.

Like the proposed project at CEMEX, surface soils at the Potrero Road site are sandy and do not have a well-developed soil horizon. The site is covered in rural and disturbed habitat and does not support sensitive natural communities or crop production. Similar to the proposed project, however, pipeline construction activities could disturb vegetated areas adjacent to designated farmland. Grading, excavation, and backfill activities in these areas could result in the loss of topsoil (a fertile soil horizon that typically contains a seed base) during excavation and backfilling. Like the proposed project, the potential significant impact from loss of topsoil on agricultural lands would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.16-1** (**Minimize Disturbance to Farmland**). Thus, combining the impacts of the components common with the proposed project with the addition of 5.5 miles of source water pipeline and the reduction in slant well acreage at Potrero Road, construction of Alternative 1 could result in an increased potential for loss of topsoil, but with mitigation, would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

The impacts of components that are common with the proposed project (i.e., the desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and Carmel Valley Pump Station) would be identical to the impacts identified for the proposed project, as summarized above in Section 5.5.2.2 (additional details in Section 4.2). The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the only components unique to Alternative 1 (see **Figure 5.4-1**) and they are not located on or near an active fault; therefore, for the exposure of people or structures to fault rupture or other ground failure, liquefaction, spreading, or settlement resulting from seismic events and groundshaking, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Only the Main System-Hidden Hills Interconnection Improvements, common with the proposed project, would be located in an area characterized as having a moderate to high susceptibility to earthquake-induced landslides. There are no existing active landslides in the study area and Alternative 1 does not propose activities that would exacerbate an otherwise unstable slope condition. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project relative to exposure of people or structures to landslides or other slope failures because only components shared with the proposed project would be located in an area with moderate to high susceptibility to earthquake-induced landslides, less than significant.

In addition to the Castroville Pipeline, the Carmel Valley Pump Station, the Main System-Hidden Hills Interconnection Improvements, and the Ryan Ranch-Bishop Interconnection Improvements that are shared with the proposed project, the slant wells at the Potrero Road parking lot and the source water pipeline in Potrero Road would be located on or in expansive soils with moderate to high corrosion potential that can corrode unprotected underground metal pipes, electrical conduits, and concrete. Like the proposed project, this alternative would be subject to existing building requirements and standards to minimize effects of expansive or corrosive soils.

Therefore, the presence of expansive or corrosive soils would result in the ***same impact conclusion*** as the proposed project, less than significant.

The slant wells at Potrero Road, like the proposed project slant wells at CEMEX, would be screened in aquifer units composed predominantly of sand and gravel, which are less prone to subsidence because of their granular structure. Seawater would replace the water pumped from the slant wells and the continuous replacement of water would keep the pore spaces between the grains filled with water, further supporting the granular structure. Consequently, the soil structure above the slant wells would be unable to subside as a result of pumping resulting in the ***same impact conclusion*** as the proposed project related to subsidence, no impact.

Alternative 1 would result in a different method of disposing effluent generated during construction and development of the slant wells. Development of the slant wells would require storing water and sandy soil in storage tanks to allow sediment to settle out, and then discharging this water into a buried diffuser system in the parking lot for percolation into the underlying beach sands. Cuttings generated during the drilling process and the well head construction would be drained in a separation unit, with the drainage discharged to the buried diffuser. The high permeability of the sandy materials at Potrero Road would be suitable for the alternative wastewater disposal system for the infiltration of effluent. Like the proposed project, disposal of water from drilling and development of the ASR-5 and -6 wells would occur in sandy soils suitable for the infiltration of water. None of the other Alternative 1 components would require an alternative wastewater disposal system and this alternative would result in the ***same impact conclusion*** as the proposed project, less than significant.

Unlike the proposed project, the slant well insertion points and source water pipeline of Alternative 1 would be located approximately 70 feet inland of the modeled extent of erosion resulting from the 100-year storm event in the year 2060 (ESA, 2014). Therefore, they would not be exposed to coastal retreat during the project lifetime and would not contribute to coastal erosion or scour because of their set back location inland of the dunes. Therefore, Alternative 1 would not require implementation of **Mitigation Measure 4.2-9** (**Slant Well Abandonment Plan**) identified for the proposed project. Alternative 1 would result in a ***decreased impact conclusion*** relative to coastal erosion compared to the proposed project, no impact.

In summary, this alternative would avoid the proposed project’s potential impacts related to coastal erosion at the CEMEX slant well site. Similar to the proposed project, there would be no new facilities on the seafloor and Alternative 1 would not result in impacts on underwater slope stability and landslides. Similar to the proposed project, operation and siting of Alternative 1 would generally result in less-than-significant impacts relative to geology, soils, and seismicity.

Cumulative Analysis

Alternative 1 would avoid impacts related to coastal erosion, and so would have no contribution to cumulative coastal erosion effects.

The geographic scope of analysis for cumulative impacts related to geology, soils, and seismicity for Alternative 1 is defined by the location of the Alternative 1 components, and is the same as that described for the proposed project in Section 4.2.6, with the exception of the different location of the subsurface intake system (Potrero Road, instead of CEMEX), and alternative source water pipeline route. Although the geographic scope generally covers a large area, geologic impacts are localized and site-specific. Section 4.2.6 describes that because of the site-specific nature of these impacts, and because the proposed project and projects within the geographic scope would be subject to the same requirements related to erosion control and adherence to building codes, the components common to the proposed project would not have a significant contribution to significant cumulative impacts related to erosion and soil-related and seismic hazards, and that after implementation of **Mitigation Measure 4.6-2b** and **4.16-1**, these components would not have a significant contribution to cumulative impacts related to the loss of topsoil. Of the projects described in **Table 4.1-2** in Section 4.1, the DeepWater Desal Project (No. 34) is the only additional project in the Alternative 1 geographic scope that would have components located near components that are unique to Alternative 1. However, the DeepWater Desal Project facilities would be located north of Potrero Road at Moss Landing and neither the facilities nor their associated impacts would geographically overlap with impacts of Alternative 1 components; therefore, the geological impacts of these components would not combine with impacts of Alternative 1. No other cumulative projects are located in this Potrero Road area or along the alternative source water pipeline route, so no changes or increases in cumulative impacts would occur compared to the proposed project. Similar to the proposed project, with implementation of **Mitigation Measures 4.6-2b** and **4.16-1**, Alternative 1's contribution to a significant cumulative impact on topsoil would be reduced to a level that is less than significant. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to geology, soils, and seismicity, less than significant with mitigation.

5.5.2.5 Direct and Indirect Effects of Project Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to Castroville Community Services District would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**). Therefore, the geologic impact analysis of Alternative 2 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 2.

Construction Impacts

Similar to the proposed project, construction would involve localized, short-term ground disturbance activities (e.g., grading, excavation, trenching, and drilling). The potential for soil erosion during construction activities would be minimal because facilities on land and all conveyance pipelines would be located in relatively flat areas with little topographic relief. The construction of an additional 6.5 miles of source water pipeline could increase the potential for erosion. However, like the proposed project, Alternative 2 construction activities would be subject to numerous existing State and local regulations that ensure erosion is minimized. Thus, combining the impacts of the proposed project components with the addition of 6.5 miles of source water pipeline and the open water intake system, construction would result in the ***same impact conclusion*** as the proposed project, less than significant.

There is no farmland at the open-water intake pump station site, and the disturbed nature of the area means that loss of topsoil would not be an issue. Similar to the proposed project, however, pipeline construction activities could disturb vegetated areas adjacent to designated farmland. Grading, excavation, and backfill activities in these areas could result in the loss of topsoil during excavation and backfilling. Like the proposed project, the potential significant impact from loss of topsoil on agricultural lands would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.16-1** (**Minimize Disturbance to Farmland**). Therefore, the potential for loss of topsoil from the construction of the components common with the proposed project and the additional 6.5 miles of source water pipeline would be increased compared to the proposed project. However, because the mitigation measure would salvage and return topsoil to its appropriate location after construction, Alternative 2 would result in the ***same impact conclusion*** as the proposed project with respect to topsoil impacts, less than significant with mitigation.

Operational and Facility Siting Impacts

Impacts from components that are common with the proposed project would be identical to the impacts identified for these components in Section 4.2. The location of the intake system components and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**) and they are not located on or near an active fault; therefore, the components of Alternative 2 located on land would result in the ***same impact conclusion*** as the proposed project for the exposure of people or structures to fault rupture or other ground failure, liquefaction, spreading, or settlement resulting from seismic events and groundshaking, less than significant. The potential for groundshaking and liquefaction-related impacts on underwater components of Alternative 2 is discussed below.

Only the Main System-Hidden Hills Interconnection Improvements, common with the proposed project, would be located in an area characterized as having a moderate to high susceptibility to earthquake-induced landslides. There are no existing active landslides in the study area and the components of Alternative 2 located on land do not include activities that would exacerbate an otherwise unstable slope condition. Therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project relative to exposure of people or structures to landslides or other slope failures, less than significant. The potential for underwater landslide and slope failure related to underwater components of Alternative 2 is discussed below.

In addition to the Carmel Valley Pump Station, the Main System-Hidden Hills Interconnection Improvements, and the Ryan Ranch-Bishop Interconnection Improvements that are shared with the proposed project, the Alternative 2 intake system and the portion of the source water pipeline north of Nashua Road/Highway 1 intersection would be located on or in expansive soils with moderate to high corrosion potential that can corrode underground metal pipes, electrical conduits, and concrete. Like the proposed project, this alternative would be subject to existing building requirements and standards to minimize effects of expansive or corrosive soils. Therefore, the presence of expansive or corrosive soils would result in the ***same impact conclusion*** as the proposed project, less than significant.

Like the proposed project, Alternative 2 would extract water from the Seaside Groundwater Basin through the ASR-5 and -6 wells, but would not extract groundwater from the Salinas Valley Groundwater Basin; as described for the proposed project, this extraction from the ASR wells would have no potential to cause subsidence. This would result in the ***same impact conclusion*** as the proposed project, no impact.

Alternative 2 would produce the same amount and type of well development water during development of the ASR-5 and -6 wells, but would not produce well development water associated with the subsurface slant wells. The high permeability of the sandy materials at the ASR wells would be suitable for the infiltration of water; therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project related to the suitability of the locations for wastewater disposal, less than significant.

The subsurface pipeline from the Alternative 2 open water intake system to the pump station on Dolan Road would be installed about 100 feet below ground using horizontal directional drilling (HDD) methods as it crosses under the coastline and beneath Highway 1, an area of the coastline that is anticipated to experience coastal erosion during the project lifetime. However, the pipeline is not anticipated to become exposed within the project lifetime (ESA, 2014) nor would it contribute to coastal erosion; therefore, Alternative 2 would have a ***reduced impact conclusion*** related to coastal erosion compared to the proposed project, no impact.

The underwater components of Alternative 2 (the open water intake system) would have the potential to degrade the physical structure of a geologic resource or alter oceanographic processes, such as sediment transport, such that the result would be measurably different from pre-existing conditions. The Alternative 2 seawater intake structure would be located in Monterey Bay within MBNMS on the slopes of the Monterey Submarine Canyon. No active faults are known to occur in the local area; however, the seawater intake system would be expected to experience seismic shaking during the project lifetime, similar to the proposed project, and could be subject to damage from seismic shaking or seismically induced liquefaction, known to have occurred in the local area. Repairs would be necessary, potentially resulting in impacts on the geologic resources and oceanographic processes at this location on the seafloor, resulting in an increased potential for impact compared to the proposed project. Additionally, because the open-water intake structure in Monterey Bay would be anchored on the slopes of the Monterey Submarine Canyon, the potential for future slope instability and underwater landslide would result in greater potential for adverse impacts on marine geologic resources compared to the proposed project. Also, placement of an open water intake on the seabed of MBNMS could affect seabed substrate and alter oceanographic processes such as sediment transport in the vicinity of Monterey Submarine Canyon. Although mitigation would be required, measures have not been defined and their efficacy cannot be guaranteed; therefore, impacts on slope stability, landslides, and alteration of geologic resources or marine processes within the Monterey Bay would result in an ***increased impact conclusion*** compared to the proposed project because they are considered to be significant and unavoidable.

In summary, Alternative 2 would avoid impacts of the proposed project related to coastal erosion at the slant wells at the CEMEX site, but the open water intake structure on the slopes of the Monterey Submarine Canyon in MBNMS could result in an ***increased impact conclusion*** compared to the proposed project because of the potential degradation of marine geologic resources or oceanographic processes. Alternative 2 would result in a significant and unavoidable impact.

Cumulative Analysis

Cumulative impacts resulting from the components of Alternative 2 that are common with the proposed project would be the same as those described for the proposed project in Section 4.2.6. In summary, these components could have a significant contribution to potentially significant cumulative impacts related to loss of topsoil, but after implementation of mitigation measures, these components would have a less than significant cumulative impact. Alternative 2 would avoid impacts related to coastal erosion, and so would avoid a contribution to cumulative coastal erosion effects.

The geographic scope of analysis for cumulative geology, soils, and seismicity impacts for Alternative 2 is defined by the location of the Alternative 2 components, and is the same as that described for the proposed project in Section 4.2.6, with the exception that the Castroville Pipeline and Pipeline to CSIP are not included, as well as the different location of the open water intake system and alternative source water pipeline. Although the geographic scope generally covers a large area, geologic impacts are localized and site-specific. Section 4.2.6 describes that because of the site-specific nature of these impacts, and because the proposed project and projects within the geographic scope would be subject to the same requirements related to erosion control and adherence to building codes, the components common to the proposed project would not have a significant contribution to significant cumulative impacts related to erosion and soil-related and seismic hazards, and that after implementation of **Mitigation Measure 4.6-2b** and **4.16-1**, these components would have a less than significant cumulative impact related to the loss of topsoil. The DeepWater Desal Project (No. 34) and the Moss Landing Community Plan (No. 37), described in **Table 4.1-2** in Section 4.1, are the only additional projects located near or overlapping the components unique to Alternative 2. Design and construction of these projects would be required to comply with the same requirements as Alternative 2. Therefore, the cumulative impacts related to erosion and geologic impacts on land would be less than significant.

Both Alternative 2 and the DeepWater Desal project would result in the placement of structures (intakes and outfalls) in Monterey Bay that would be anchored on the slopes of the Monterey

Submarine Canyon. Therefore, the cumulative potential for future slope instability and underwater landslide would be increased compared to either project alone, and the cumulative impact would be significant. Although mitigation measures would be required, they have not been defined and their efficacy cannot be guaranteed. Therefore, cumulative impacts from the underwater landslide risk would remain significant and unavoidable, and the open-water intake component of Alternative 2 would have a significant contribution to that significant cumulative impact. Therefore, Alternative 2 would result in an ***increased impact conclusion*** compared to the proposed project for cumulative effects related to geology, soils, and seismicity, significant and unavoidable.

5.5.2.6 Direct and Indirect Effects of the Project Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The pipelines for the intake and discharge systems would be installed using HDD. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-3**, ASR 5 and 6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**). Therefore, the geologic impact analysis of Alternative 3 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 3.

Construction Impacts

Similar to the proposed project, construction would involve localized, short-term ground disturbance activities (e.g., grading, excavation, trenching, and drilling). The potential for soil erosion during construction activities would be minimal because facilities on land and all conveyance pipelines would be located in relatively flat areas with little topographic relief. The construction of larger facilities on land (i.e., the desalination plant and data center) and an additional 31.5 miles of desalinated water pipeline could increase the potential for erosion compared to the proposed project. However, like the proposed project, Alternative 3 construction activities would be subject to numerous existing State and local regulations that ensure erosion is minimized.

Thus, although Alternative 3 construction would have a greater potential for erosion due to the substantial additional area of ground disturbance, compliance with these regulations would ensure that it would result in the ***same impact conclusion*** as the proposed project, less than significant.

There is no farmland at the desalination plant, data center, substation, or open-water intake pump station sites, and the disturbed nature of the area means that loss of topsoil would not be an issue. Similar to the proposed project, however, pipeline construction activities could disturb vegetated areas adjacent to designated farmland. Grading, excavation, and backfill activities in these areas could result in the loss of topsoil during excavation and backfilling. Like the proposed project, the potential significant impact from loss of topsoil on agricultural lands would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.16-1** (**Minimize Disturbance to Farmland**). Therefore, the potential for loss of topsoil from the construction of the components common with the proposed project and the additional 31.5 miles of pipeline would be increased compared to the proposed project. However, because the mitigation measure would salvage and return topsoil to its appropriate location after construction, Alternative 3 would result in the ***same impact conclusion*** as the proposed project with respect to topsoil impacts, less than significant with mitigation.

Operational and Facility Siting Impacts

Impacts from components that are common with the proposed project (i.e., new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and Carmel Valley Pump Station) would be identical to the impacts identified for the proposed project. The location of the intake, discharge, desalination plant, data center, substation, and additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**) and they are not located on or near an active fault; therefore, the components of Alternative 3 located on land would result in the ***same impact conclusion*** as the proposed project related to exposure of people or structures to fault rupture or other ground failure, liquefaction, spreading, or settlement resulting from seismic events and groundshaking, less than significant. The potential for groundshaking- and liquefaction-related impacts from underwater components of Alternative 3 is discussed below.

Only the Main System-Hidden Hills Interconnection Improvements, common with the proposed project, would be located in an area characterized as having a moderate to high susceptibility to earthquake-induced landslides. There are no existing active landslides in the area and the components of Alternative 3 located on land do not include activities that would exacerbate an otherwise unstable slope condition. Therefore, Alternative 3 would result in the ***same impact conclusion*** as the proposed project relative to exposure of people or structures to landslides or other slope failures, less than significant. The potential for underwater landslide and slope failure related to underwater components of Alternative 3 is discussed below.

In addition to the Carmel Valley Pump Station, the Main System-Hidden Hills Interconnection Improvements, and the Ryan Ranch-Bishop Interconnection Improvements that are shared with the proposed project, the intake and discharge systems and the desalinated water pipeline for Alternative 3 north of Nashua Road/Highway 1 intersection would be located on or in expansive soils with moderate to high corrosion potential Like the proposed project, this alternative would be subject to existing building requirements and standards to minimize effects of expansive or corrosive soils. Therefore, the presence of expansive or corrosive soils would result in the ***same impact conclusion*** as the proposed project, less than significant.

Like the proposed project, Alternative 3 would extract water from the Seaside Groundwater Basin through the ASR-5 and -6 wells, but would not extract groundwater from the Salinas Valley Groundwater Basin; as described for the proposed project, this extraction from the ASR wells would have no potential to cause subsidence. This would result in the ***same impact conclusion*** as the proposed project for subsidence, no impact.

Alternative 3 would produce the same amount and type of well development water during development of the ASR 5 and 6 wells but would not produce well development water associated with the subsurface slant wells. The high permeability of the sandy materials would be suitable for the infiltration of water; therefore, Alternative 3 would result in the ***same impact conclusion*** as the proposed project related to the suitability of the locations for wastewater disposal, less than significant.

The four subsurface pipelines between the Alternative 3 open water intake/brine disposal systems and the pump station on Dolan Road would be installed about 100 feet below ground using HDD methods as they cross under the coastline and beneath Highway 1, an area of the coastline that is anticipated to experience coastal erosion during the project lifetime. Due to their depth below ground, the pipelines would not become exposed within the project lifetime nor would they contribute to coastal erosion; therefore, Alternative 3 would have a ***reduced impact conclusion*** related to coastal erosion compared to the proposed project, no impact.

The underwater features of Alternative 3 would have the potential to degrade the physical structure of a geologic resource or alter oceanographic processes, such as sediment transport, such that the result would be measurably different from pre-existing conditions. The Alternative 3 seawater intake and brine disposal systems would be located in Monterey Bay within MBNMS on the slopes of the Monterey Submarine Canyon. No active faults are known to occur in the local area; however, the seawater intake and brine disposal system would be expected to experience seismic shaking during the project lifetime, similar to the proposed project; and could be subject to damage from seismic shaking or seismically induced liquefaction, known to have occurred in the local area. Repairs would be necessary, potentially resulting in impacts on the geologic resources and oceanographic processes at this location on the seafloor. Additionally, because the open-water intake and brine disposal structures in Monterey Bay would be anchored on the slopes of the Monterey Submarine Canyon, the potential for future slope instability and underwater landslide would be increased compared to the proposed project. Also, placement of an open water intake and brine disposal system on the seabed of MBNMS could affect seabed substrate and alter oceanographic processes such as sediment transport in the vicinity of Monterey Submarine Canyon. Although mitigation would be required, measures have not been defined and their efficacy cannot be guaranteed. Therefore, impacts on slope stability, landslides, and alteration of geologic resources or marine processes in the Monterey Bay within MBNMS would be an

increased impact conclusion compared to the proposed project, and are considered to be significant and unavoidable.

In summary, Alternative 3 would avoid impacts related to coastal erosion at the proposed project slant wells at CEMEX, but because of significant and unavoidable impacts related to degradation of marine geologic resources or oceanographic processes as a result of the intake and brine discharge structures on the slopes of the Monterey Submarine Canyon within MBNMS, Alternative 3 would result in an ***increased impact conclusion*** compared to the proposed project.

Cumulative Analysis

Cumulative impacts resulting from the components of Alternative 3 that are common with the proposed project would be the same as those described for the proposed project in Section 4.2.6. In summary, these components could have a cumulatively significant impact related to loss of topsoil, but after implementation of mitigation measures, these components would have a less than significant cumulative impact. Alternative 3 would avoid impacts related to coastal erosion, and so would avoid a contribution to cumulative coastal erosion effects.

The geographic scope of analysis for cumulative geology, soils, and seismicity impacts for Alternative 3 is defined by the location of the Alternative 3 components. Although the geographic scope generally covers a large area, geologic impacts are localized and site-specific. Section 4.2.6 describes that because of the site-specific nature of these impacts, and because the proposed project and projects within the geographic scope would be subject to the same requirements related to erosion control and adherence to building codes, the components common to the proposed project would not have a significant cumulative impact related to erosion and soil-related and seismic hazards, and that after implementation of **Mitigation Measure 4.6**-**2b** and **4.16-1**, these components would have a less than significant cumulative impact related to the loss of topsoil. The Moss Landing Community Plan (No. 37 in **Table 4.1-2** in Section 4.1) and the GWR Project (No. 59) are the only additional projects located geographically near or overlapping the components unique to Alternative 3. Design and construction of these projects would be required to comply with the same requirements as Alternative 3. Therefore, the cumulative impacts related to erosion and geologic impacts on land would be less than significant.

Alternative 3 would result in the placement of structures (intake and outfall) in Monterey Bay that would be anchored on the slopes of the Monterey Submarine Canyon, resulting in a significant and unavoidable impact relative to underwater slope stability and landslides. However, no reasonably foreseeable cumulative projects would include additional structures in this location. Therefore, a cumulative analysis is not applicable to this impact for Alternative 3.

Overall, the project-level significant and unavoidable impact underwater slope stability and landslides notwithstanding (because no cumulative analysis is applicable to this impact), with implementation of mitigation measures identified in Section 4.2, Alternative 3's contribution to significant cumulative impacts would be reduced to a level that is less than significant. Therefore, Alternative 3 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to geology, soils, and seismicity, less than significant with mitigation.

5.5.2.7 Direct and Indirect Effects of Project Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**). Therefore, the geologic impact analysis of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4.

Construction Impacts

Similar to the proposed project, construction would involve localized, short-term ground disturbance activities (e.g., grading, excavation, trenching, and drilling). The potential for soil erosion during construction activities would be minimal because project facilities and all conveyance pipelines would be located in relatively flat areas with little topographic relief. The construction of an additional 6.5 miles of desalinated water pipeline could increase the potential for erosion. However, like the proposed project, Alternative 4 construction activities would be subject to numerous existing State and local regulations that ensure erosion is minimized. Thus, combining the impacts of the proposed project components with the Alternative 4 intake, discharge, and desalination plant and addition of 6.5 miles of desalinated water pipeline and the open water intake system, construction would result in the ***same impact conclusion*** as the proposed project, less than significant.

There is no farmland at the intake, discharge, or desalination plant sites and the disturbed nature of the area means that loss of topsoil would not be an issue. The 16.5-acre parcel would be located within the approximately 200-acre parcel that is currently developed, and as discussed in Section 5.5.2.1, the ground consists of an intermediate mix of fill material and underlying native sandy loam soil. Therefore, no loss of topsoil would result at this site during construction. Similar to the proposed project, however, pipeline construction activities could disturb vegetated areas adjacent to designated farmland. Grading, excavation, and backfill activities in these areas could result in the loss of topsoil during excavation and backfilling. Like the proposed project, the potential significant impact from loss of topsoil on agricultural lands would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.16-1** (**Minimize Disturbance to Farmland**). Thus, combining the impacts of the Alternative 4 components, construction is expected to result in the ***same impact conclusion*** the proposed project with respect to topsoil impacts, less than significant with mitigation.

Operational and Facility Siting Impacts

Impacts from components that are common with the proposed project would be identical to the impacts identified for these components in Section 4.2. The location of the intake, discharge, desalination plant and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**) and they are not located on or near an active fault; therefore, the components of Alternative 4 located on land would result in the ***same impact conclusion*** as the proposed project related to exposure of people or structures to fault rupture or other ground failure, liquefaction, spreading or settlement resulting from seismic events and groundshaking, less than significant. The potential for groundshaking- and liquefaction-related impacts from underwater components of Alternative 4 is discussed below.

Only the Main System-Hidden Hills Interconnection Improvements, common with the proposed project, would be located in an area characterized as having a moderate to high susceptibility to earthquake-induced landslides. There are no existing active landslides in the study area and the components of Alternative 4 located on land do not include activities that would exacerbate an otherwise unstable slope condition. Therefore, Alternative 4 would result in the ***same impact conclusion*** as the proposed project relative to exposure of people or structures to landslides or other slope failures, less than significant. The potential for underwater landslide and slope failure related to underwater components of Alternative 4 is discussed below.

In addition to the Carmel Valley Pump Station, the Main System-Hidden Hills Interconnection Improvements, and the Ryan Ranch-Bishop Interconnection Improvements, the intake/discharge system and the desalinated water pipeline for Alternative 4 north of Nashua Road/Highway 1 intersection would be located on or in expansive soils with moderate to high corrosion potential that can corrode underground metal pipes, electrical conduits, and concrete. Like the proposed project, this alternative would be subject to existing building requirements and standards to minimize effects of expansive or corrosive soils. Therefore, the presence of expansive or corrosive soils would result in the ***same impact conclusion*** as the proposed project, less than significant.

Like the proposed project, Alternative 4 would extract water from the Seaside Groundwater Basin through the ASR-5 and -6 wells but would not extract groundwater from the Salinas Valley Groundwater Basin; as described for the proposed project, this extraction from the ASR wells would have no potential to cause subsidence. This would result in the ***same impact conclusion*** as the proposed project for subsidence, no impact.

Alternative 4 would produce the same amount and type of well development water during development of the ASR-5 and -6 wells but would not produce well development water associated with the subsurface slant wells. The high permeability of the sandy materials would be suitable for the infiltration of water; therefore, Alternative 4 would result in the ***same impact conclusion*** as the proposed project related to the suitability of the locations for wastewater disposal, less than significant.

Alternative 4 intake and outfall pipelines would be located on and under the seafloor, and would extend inland to the desalination facility from the existing caisson on the beach at the end of Sandholdt Road. The caisson itself is currently being subjected to coastal erosion (ESA, 2014) and would be removed at some point soon, re-located inland, or reinforced in place with coastal armoring. A new pump house proposed for on top of the caisson would extend the use of the caisson and postpone the need to remove it. The Coastal Act provides that seawalls and other forms of construction that alter natural shoreline processes “shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply.” The Coastal Act also requires that “new development ... assure stability and structural integrity, and neither create nor contribute significantly to erosion ... or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.” The continued use of the caisson on the beach could result in accelerated erosion, could alter the existing landforms along the coast, and could expose adjacent properties to coastal flooding.

However, the application of shoreline protective measures at the existing caisson could be permitted under the Coastal Act if: (1) there is an existing structure, public beach, or coastal-dependent use that is; (2) in danger from erosion; and (3) the shoreline protection is both required to address the danger (the least environmentally-damaging, feasible alternative) and (4) designed to eliminate or mitigate impacts on sand supply. While the applicant may propose such a measure to protect the caisson during the operations of Alternative 4, the details of the proposed mitigation are unknown and therefore, their efficacy cannot be determined. The impacts identified here would result in an ***increased impact conclusion*** compared to the proposed project and impacts would be significant and unavoidable.

The underwater features of Alternative 4 would have the potential to degrade the physical structure of a geologic resource or alter oceanographic processes, such as sediment transport, such that the result would be measurably different from pre-existing conditions. The Alternative 4 seawater intake and brine disposal systems would be located in Moss Landing in Monterey Bay within MBNMS on the slopes of the Monterey Submarine Canyon. No active faults are known to occur in the local area; however, the seawater intake and brine disposal system would be expected to experience seismic shaking during the project lifetime, similar to the proposed project, and could be subject to damage from seismic shaking or seismically induced liquefaction, known to have occurred in the local area. Repairs would be necessary, potentially resulting in impacts on the geologic resources and oceanographic processes at this location on the seafloor. Additionally, because the open-water intake and brine disposal structures in Monterey Bay would be anchored on the slopes of the Monterey Submarine Canyon, the potential for future slope instability and underwater landslide would be increased compared to the proposed project. Also, placement of an open water intake and brine disposal system on the seabed of MBNMS could affect seabed substrate and alter oceanographic processes such as sediment transport in the vicinity of Monterey Submarine Canyon. Although mitigation measures would be required, they have not been defined and their efficacy cannot be guaranteed. Therefore, impacts on slope stability, landslides, and alteration of geologic resources or marine processes within the Monterey Bay within MBNMS would be an ***increased impact conclusion*** compared to the proposed project, and are considered to be significant and unavoidable.

In summary, Alternative 4 would result in significant and unavoidable impacts related to coastal erosion and degradation of marine geologic resources or oceanographic processes. Therefore, Alternative 4 would result in an ***increased impact conclusion*** compared to the proposed project.

Cumulative Analysis

Cumulative impacts resulting from the components of Alternative 4 that are common with the proposed project would be the same as those described for the proposed project in Section 4.2.6. In summary, these components could have a significant cumulative impact related to loss of topsoil, but after implementation of mitigation measures, the impact would be less than significant.

The geographic scope of analysis for cumulative geology, soils, and seismicity impacts for Alternative 4 is defined by the location of the Alternative 4 components. Although the geographic scope generally covers a large area, geologic impacts are localized and site-specific. Section 4.2.6 describes that because of the site-specific nature of these impacts, and because the proposed project and projects within the geographic scope would be subject to the same requirements related to erosion control and adherence to building codes, the components common to the proposed project would have less than significant cumulative impacts related to erosion and soil-related and seismic hazards, and that after implementation of **Mitigation Measure 4.6-2b** and **4.16-1**, these components would have a less than significant cumulative impact related to the loss of topsoil. The DeepWater Desal Project (No. 34) and the Moss Landing Community Plan (No. 37), described in **Table 4.1-2** in Section 4.1, are the only additional projects located near or overlapping the components unique to Alternative 4. Design and construction of these projects would be required to comply with the same requirements as Alternative 4. Therefore, the cumulative impacts related to erosion and geologic impacts on land would be less than significant.

Alternative 4 would result in an increased risk of coastal erosion compared to the proposed project. However, no reasonably foreseeable cumulative projects would include additional structures in this location. Therefore, a cumulative analysis is not applicable to this impact for Alternative 4.

Both Alternative 4 and the DeepWater Desal project would result in the placement of structures (intakes and outfalls) in Monterey Bay that would be anchored on the slopes of the Monterey Submarine Canyon. Therefore, the cumulative potential for future slope instability and underwater landslide would be increased compared to either project alone, and would be significant. Even with mitigation, cumulative impacts from the risk of underwater landslide would remain significant and unavoidable, and the incremental contribution of the open-water intake component of Alternative 4 would result in a significant cumulative impact. Therefore, Alternative 4 would result in an ***increased impact conclusion*** compared to the proposed project for cumulative effects related to geology, soils, and seismicity, significant and unavoidable.

5.5.2.8 Direct and Indirect Effects of Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction Impacts

The construction of the components of Alternative 5a and 5b would result in erosion impacts similar to those described and analyzed for the proposed project and Alternative 1, respectively, but reduced in scale due to the construction of fewer slant wells, resulting in a decreased potential for soil erosion in proportion to the decreased amount of ground disturbance necessary to construct fewer wells, but with compliance with relevant State and local regulations, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project, less than significant.

The potential significant impact associated with loss of topsoil on agricultural lands is associated with several components that would be the same as the proposed project (i.e., Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline), and so would result in the same effect after implementation of **Mitigation Measure 4.16-1** (**Minimize Disturbance to Farmland**) and the ***same impact conclusion*** as the proposed project; less than significant with mitigation.

Operational and Facility Siting Impacts

For the same reasons described previously for the proposed project and Alternative 1, although components of Alternative 5a and 5b are not located on or near an active fault, they would be expected to experience seismic shaking during the project lifetime. Like the proposed project, the structural elements of these alternatives would be required to undergo appropriate design-level geotechnical evaluations prior to final design and construction. Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project relative to exposure of people or structures to fault rupture or other ground failure, liquefaction, spreading, or settlement; less than significant.

For both Alternative 5a and 5b, only the Main System-Hidden Hills Interconnection Improvements, common with the proposed project, would be located in an area characterized as having a moderate to high susceptibility to earthquake-induced landslides. There are no existing active landslides in the area and the alternatives do not propose activities that would exacerbate an otherwise unstable slope condition. Therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project, less than significant.

Impacts related to expansive and corrosive soils would be the same as described for the proposed project or Alternative 1 because the potentially susceptible facilities would be the same.

Therefore, the presence of expansive or corrosive soils would result in the ***same impact conclusion*** as the proposed project, less than significant.

The slant wells for both Alternative 5a and 5b, like the proposed project and Alternative 1 slant wells, would be screened in aquifer units composed predominantly of sand and gravel, which are less prone to subsidence because of their granular structure. Seawater would replace the water pumped from the slant wells and the continuous replacement of water would keep the pore spaces between the grains filled with water, further supporting the granular structure. Consequently, the soil structure above the slant wells would be unable to subside as a result of pumping resulting in the ***same impact conclusion*** as the proposed project on subsidence, no impact.

As described previously for the subsurface slant wells at CEMEX under the proposed project and at Potrero Road under Alternative 1, the Alternatives 5a and 5b subsurface slant wells would each require an alternative wastewater disposal system for infiltration of development water, each of which would have a less-than-significant impact. The total amount of development water generated would be reduced in proportion to the reduced number of slant wells. Additionally, both Alternatives 5a and 5b would produce the same amount and type of well development water as the proposed project during development of the ASR 5 and 6 wells. The high permeability of the sandy materials would be suitable for the infiltration of water; therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** related to the suitability of the locations for wastewater disposal as the proposed project, less than significant.

Under Alternative 5a, the existing test slant well that would be converted to a permanent well would be the same as under the proposed project. It is possible that this well might become exposed on the beach during its operational life, potentially accelerating and/or exacerbating natural rates of coastal erosion, scour, and dune retreat. This potentially significant impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.2-9** (**Slant Well Abandonment Plan**), and therefore would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation. Under Alternative 5b, unlike the proposed project but similar to Alternative 1, the slant wells at Potrero Road would not be exposed to coastal retreat during the project lifetime and would have no impact related to coastal erosion because of their location inland of the dunes. Alternative 5b would therefore result in a ***reduced impact conclusion*** compared to the proposed project relative to coastal erosion, no impact.

In summary, Alternatives 5a and 5b would result in less-than-significant impacts with mitigation for geology, soils, and seismicity, similar to the proposed project. As with the proposed project, these alternatives would not result in impacts related to underwater slope stability and landslides or the degradation of marine geologic resources or oceanographic processes. Unlike Alternative 5a and the proposed project, Alternative 5b would not be affected by coastal erosion during the project lifetime.

Cumulative Analysis

Combined Impacts with GWR Project

The components of the GWR Project (No. 59 in **Table 4.1-2** in Section 4.1) would overlap with components of Alternatives 5a and 5b, including pipelines and well facilities. As described in the

GWR Project EIR Section 4.8.4.3 (MRWPCA and MPWMD, 2016), standard construction practices to prevent and minimize construction-related erosion would be included in GWR Project contract documents and SWPPPs that are required pursuant to NPDES regulations and permits for construction on 1 acre or more (GWR Impact GS-1). Recommendations of the preliminary geotechnical investigations prepared for the GWR Project will be incorporated into the final design and construction specifications, and construction will comply with applicable codes and requirements of the CBC and applicable ordinances (GWR Impact GS-2). Because the GWR Project will comply with these requirements, and because geologic impacts tend to be localized and site-specific, and most GWR Project components would not overlap geographically with the Alternative 5 components, the combined impacts related to erosion and geologic impacts on land would result in the ***same impact conclusion*** as the proposed project, less than significant. The GWR Project would not contribute to combined impacts related to the loss of topsoil (GWR Impact GS-2); therefore, impacts would be as described for Alternative 5, and would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Alternative 5 and the GWR Project would not create increased combined impacts related to seismic, liquefaction, and expansive and corrosive soil issues; landslides; land subsidence; or wastewater disposal (GWR Impacts GS-3, GS-4, GS-6, and GS-7); therefore, the combined impacts would have the ***same impact conclusion*** as the proposed project, less than significant.

As described in the GWR Project EIR, a segment of the Monterey Pipeline along Del Monte Boulevard could become exposed due to projected sea level rise and associated coastal erosion (GWR Impact GS-5), and **Mitigation Measure GS-5** is required to bury the pipeline at a depth below the 2060 100-year lower profile erosion envelope. Because it would not be located in the same locations that Alternative 5 would experience coastal erosion, this impact would not combine with impacts of Alternative 5 related to coastal erosion to create increased combined impacts; and with implementation of applicable mitigation for the GWR Project and for Alternative 5a (**Mitigation Measure 4.2-9**; not applicable to Alternative 5b), this combined impact would have the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Impacts of Full Cumulative Scenario

The geographic scope of analysis for cumulative geology, soils, and seismicity impacts for Alternatives 5a and 5b is the same as that for the proposed project and Alternative 1, respectively. Although the geologic setting generally covers a large area, geologic impacts tend to be localized and site-specific. The DeepWater Desal Project (No. 34 in **Table 4.1-2** in Section 4.1) is proposed to be located north of Potrero Road at Moss Landing and neither the facilities nor their associated impacts would geographically overlap with the impacts of Alternative 5a or 5b. As described above, some components of the GWR Project would overlap with components of Alternatives 5a and 5b. Various other cumulative projects are located throughout the area. Alternatives 5a and 5b would result in contributions to cumulative impacts that would be similar to the proposed project and Alternative 1, respectively. The cumulative projects would be required to comply with the same requirements as Alternatives 5a and 5b, such as the state Construction General Permit and its required SWPPP that would control and minimize erosion during construction activities. The design of the cumulative projects would be required to comply with the CBC and County ordinances that would require implementation of the recommendations of required geotechnical investigations. Therefore, the cumulative impacts related to erosion and geologic impacts on land would be less than significant.

As described for the proposed project in Section 4.2.6, the components affecting topsoil (listed above under Construction Impacts) would result in a significant cumulative loss of topsoil; however, no additional projects in the geographic scope would further contribute to this cumulative impact. The contribution of Alternatives 5a and 5b would be reduced to a level that is less than significant with implementation of **Mitigation Measure 4.16-1**.

Alternatives 5a and 5b would have no impact on land subsidence, and therefore would not contribute to cumulative subsidence-related impacts. No other projects would overlap with the footprints of Alternatives 5a and 5b to contribute to cumulative impacts related to seismic, liquefaction, and expansive and corrosive soil issues, landslides, or wastewater disposal.

For impacts related to coastal erosion, under Alternative 5a, none of the cumulative projects would combine with the effects of Alternative 5a to result in a cumulative impact; therefore, a cumulative analysis is not applicable to this impact for Alternative 5a. Alternative 5b would not be subject to coastal erosion and so would not contribute to a cumulative coastal erosion-related impact.

In summary, Alternatives 5a and 5b could result in significant contributions to significant cumulative impacts relative to geology, soils, and seismicity, but these contributions would be reduced to a level that is less than significant after implementation of applicable mitigation measures, thus resulting in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

5.5.2.9 References

Environmental Science Associates (ESA), 2014. *Technical Memorandum, Monterey Peninsula Water Supply Project: Analysis of Historic and Future Coastal Erosion with Sea Level Rise*, March 19, 2014.

MPWMD, 2016. Addendum to the Aquifer Storage and Recovery Project Environmental Impact Report/Environmental Assessment and the Pure Water Monterey/Groundwater Replenishment Project Environmental Impact Report for the Hilby Avenue Pump Station. http://www.mpwmd.net/asd/board/boardpacket/2016/20160620/16/Item-16-Exh-A.pdf.

MRWPCA and MPWMD, 2016. Consolidated Final Environmental Impact Report for the Pure Water Monterey Groundwater Replenishment Project, Volume IV, Exhibit B. http://purewatermonterey.org/wp/wp-content/uploads/Volume-IV-EIR-Certification-and-Project-Approval-Jan-2016.pdf.

NRCS, 2015. Soil Map Monterey County, California. July8, 2016.

5.5.3 Surface Water Hydrology and Water Quality

The evaluation criteria used to assess surface water hydrology and water quality impacts from implementation of the alternatives are the same as those used to assess impacts of the proposed project (see Section 4.3.3) and include specific thresholds related to: the degradation of water quality, including impacts on ocean waters within MBNMS from operational discharges; the alteration of drainage patterns in a manner that may result in erosion or flooding; stormwater conveyance capacity; and, flooding and flood risks.

5.5.3.1 Setting/Affected Environment

The study area relevant to the evaluation of surface water hydrology and water quality impacts for all alternatives is the same as that described for the proposed project in Section 4.3.1 and comprises the Salinas River watershed, Carmel River watershed, and the southern portion of the Monterey Bay south of Elkhorn Slough, which is a part of Monterey Bay National Marine Sanctuary (MBNMS). Water quality in the lower Salinas River is impaired by pesticides and nutrients. Excess sediment, which occurs due to various land uses and road designs, is a key issue in the Carmel River. The seawater in Monterey Bay is a mixture of water masses from different parts of the Pacific Ocean and water quality in Monterey Bay is a function, in part, of different constituents present in the water, as well as the seasonal ocean climate which affects ocean temperature and salinity. The waters of Monterey Bay contain numerous legacy pesticides such as organochlorine pesticides, Dieldrin and dichloro-diphenyl-trichloroethane (DDT), as well as chemical products in current use such as organophosphate pesticides, polynuclear aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). The waters of Monterey Bay exceeded the Ocean Plan 30-day average PCB water quality objective of 1.9×10^{-5} micrograms per liter (µg/L)[4] for most of the years between 2004 and 2013. Monterey Bay also receives point source discharges from pipelines and other structures. Such permitted discharges into Monterey Bay are subject to prohibitions under MBNMS regulations as well as NPDES permit regulations and water quality requirements established by the Central Coast RWQCB. Flooding and flood hazard risks, including those from tsunami, dam failure, and sea level rise, vary throughout the study area depending on location. FEMA 100-year flood hazard zones in the study area are shown in **Figure 4.3-2**. Areas that are subject to coastal flooding and sea level rise are shown in **Figure 4.3-3**.

5.5.3.2 Summary of Direct and Indirect Effects of the Proposed Project (Slant Wells at CEMEX)

As described in detail in Chapter 3, Description of the Proposed Project, the proposed project (see **Figure 3-2**) would include construction of a desalination plant on 25 acres along Charles Benson Road northeast of the City of Marina that would create approximately 15 acres of impervious surfaces, up to nine new subsurface slant wells at the CEMEX active mining area and conversion of the existing test slant well to a permanent well. The slant well construction at the CEMEX site would result in 9 acres of disturbance during construction with approximately 0.7 acres of permanent land alteration associated with the wells. The proposed project would also include

[4] This objective for protection of human health is listed in the Ocean Plan and is discussed further in Section 4.3.2.1, State Regulatory Framework.

improvements to the existing Seaside Groundwater Basin aquifer storage and recovery (ASR) system, pump stations, storage tanks, and about 21 miles of new water conveyance pipelines. No construction or placement of facilities on the seafloor would occur.

The direct and indirect effects of the proposed project have been grouped and summarized below, in the context of the project construction phase, the operational phase and effects resulting from facility siting. For a more detailed analysis and discussion of the following summarizes refer to Section 4.3.5. Overall, the surface hydrology and water quality related impacts of the proposed project would be less than significant with mitigation.

Construction Impacts

Construction activities have the potential to degrade water quality as a result of soil erosion as a result of soil disturbance from grading and excavation as well as the accidental release of hazardous chemicals; from the discharge of dewatering effluent associated with excavations and drilling, and; from discharges associated with cleaning/flushing newly installed pipelines. Construction activities can also permanently or temporarily result in altered drainage patterns that can result in on- and off-site erosion, siltation, and flood risk increases.

Impact 4.3-1: Degradation of water quality associated with increased soil erosion and inadvertent releases of hazardous chemicals during general construction activities.

Soil disturbing activities could result in soil erosion and the migration of soil and sediment in stormwater runoff to downgradient water bodies and storm drains. The temporary storage and use of construction chemicals such as adhesives, solvents, fuels, and petroleum lubricants could, if not managed appropriately, result in an accidental release or spills. For all project facilities, mandatory compliance with NPDES Construction General Permit requirements would involve implementation of erosion and stormwater and water quality control measures, which would prevent substantial adverse effects on water quality during construction. The impact would be less than significant for all project components.

Impact 4.3-2: Degradation of water quality from construction-related discharges of dewatering effluent from open excavations and from water extracted during drilling and development of the subsurface slant wells, the ASR-5 and ASR-6 Wells.

The majority of general construction dewatering effluent associated with excavations would be disposed of in accordance with the General Waste Discharge Requirements (Central Coast RWQCB Order R3-2011-0223). However, discharges of dewatering effluent exceeding the water quality limitations in the General WDRs would result in a significant impact. This impact would be reduced to a less-than-significant level with implementation of the **Mitigation Measure 4.7-2b** (**Soils and Groundwater Management Plan**). Water produced during the drilling and development of the slant wells and ASR-5 and 6 Wells would be disposed of in accordance with the MRWPCA's NPDES permit (for discharges via the ocean outfall) and General Waiver. All discharges of water produced during well drilling and development would occur in compliance with regulatory requirements that are protective of the receiving waters. Therefore, the impact associated with discharges of water produced during drilling and development of the subsurface slant wells and

ASR-5 and ASR-6 Wells would be less than significant. Overall, impacts associated with discharges of dewatering effluent during construction would be less than significant with mitigation.

Impact 4.3-3: Degradation of water quality from discharges of treated water and disinfectant from existing and newly installed pipelines during construction.

Prior to constructing the connections between existing and new pipelines, segments of existing pipelines would need to be drained and disinfected before being returned to service. Newly installed pipelines (i.e., Source Water Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Brine Discharge Pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR pipelines, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements) would also be disinfected before being put into service. Adherence to the General Waste Discharge Requirements (WDRs) would ensure this impact would be less than significant.

Impact 4.3-8: Alteration of drainage patterns such that there is a resultant increase in erosion, siltation, or the rate or amount of surface runoff resulting in flooding on- or offsite or the exceeding of the stormwater drainage system capacity.

For all project facilities, mandatory compliance with NPDES Construction General Permit requirements and local regulations would involve implementation of erosion and stormwater control measures to minimize and avoid erosion, siltation, and increased runoff on- and off-site. Implementation of the proposed facilities would not result in substantially altered drainage patterns or increased stormwater runoff as a result of increased impervious surfaces. The subsurface slant wells, MPWSP Desalination Plant, would be required to implement Low Impact Development elements into the final site design, ensuring stormwater runoff is not increased and that flood risks on- or offsite are avoided and that stormwater conveyance structure capacity is not exceeded. The impact would be less than significant. No changes in drainage patterns would result from implementation of the proposed pipelines because they would be underground. This negligible increase in impervious surfaces would not result in substantial impacts related to changes in drainage patterns, erosion or siltation, flooding, or flows in excess of the stormwater drainage system.

Operational Impacts

Operational activities that would result in potential water quality related impacts would include the discharge of desalination brine (either alone, or blended with varying volumes of secondary-treated wastewater depending on the time of year) into the waters of MBNMS. Discharges related to well maintenance activities could degrade the water quality of receiving waters. Summaries of the water quality impacts are provided below.

Impact 4.3-4: Violate water quality standards or waste discharge requirements or degrade water quality from increased salinity as a result of brine discharge from the operation of the MPWSP Desalination Plant.

The modeling and analysis of salinity concentrations, mixing, and dilution at the outfall indicates that for all operational scenarios, and assuming a continuous brine discharge stream, the brine-only discharges and discharges of brine blended with varying volumes of wastewater will meet Ocean Plan salinity and dissolved oxygen standards and will not result in salinity related toxicity or hypoxia on the ocean floor. Specifically, the discharges would result in salinity levels that would not exceed 2 ppt above ambient salinity levels at the edge of the ZID (located 10 feet to 39 feet from the diffuser depending on discharge scenario). The proposed project, therefore, would not exceed or violate the Ocean Plan salinity standards or degrade water quality in terms of salinity. Therefore, operational discharges from the MPWSP would not increase salinity levels or impact Dissolved Oxygen (hypoxia) in a manner that violates water quality standards or waste discharge requirements or otherwise degrades the water quality of receiving waters in MBNMS. Impacts would be less than significant. While impacts related to water quality from increased salinity have been determined to be less than significant based on model analyses, and although it is likely that monitoring would occur based on the Ocean Plan requirements and associated NPDES permit requirements, implementation of **Mitigation Measure 4.3-4** (**Operational Discharge Monitoring, Analysis, Reporting, and Compliance**) would ensure compliance with the Ocean Plan monitoring requirements as well as consistency with MBNMS guidelines for operation of desalination facilities that are protective of the beneficial uses (including aquatic wildlife and habitat) of Monterey Bay.

Impact 4.3-5: Violate water quality standards or waste discharge requirements or otherwise degrade the water quality of receiving waters in Monterey Bay as a result of brine discharge from the operation of the MPWSP Desalination Plant.

The model-based analyses of water quality constituent concentrations, mixing, and dilution at the outfall diffuser for all operational scenarios concluded constituent concentrations could become elevated to levels greater than 80 percent of the Ocean Plan water quality objectives for ammonia and cyanide for some operational discharge scenarios (when low wastewater volumes are co-mingled with the brine). For an additional thirteen constituents, there is not enough information to assess concentrations at the edge of the ZID due to differences in Method Reporting Limits (MRLs) used to assess the source waters or due to MRLs being higher than Ocean Plan objectives. Therefore, it is conservatively concluded that Ocean Plan water quality objectives could potentially be exceeded during operations for some operational discharge scenarios, resulting in a significant impact. Significant impacts would be reduced to a less-than-significant level by implementing **Mitigation Measure 4.3-5** (**Implement Protocols to Avoid Exceeding Water Quality Objectives**). Mitigation Measure 4.3-5 would require CalAm to perform an extensive water quality assessment using protocols defined in Appendix II “Minimum Levels” of the 2015 California Ocean Plan prior to implementation of the MPWSP. Operational discharges that cannot be demonstrated to conform to the Ocean Plan water quality objectives may only be released following implementation of additional design features, engineering solutions, and/or operational measures that ensure compliance with objectives. Additionally, future water quality testing and analysis, as required under the NPDES permit process, would ensure that operational discharges under the MPWSP would fully comply with Ocean Plan water quality objectives and NPDES effluent limitations, including limits for toxicity and radioactivity.

Impact 4.3-6: Degrade water quality due to discharges associated with maintenance of the subsurface slant wells and the ASR-5 and ASR-6 Wells.

Routine maintenance activities of the subsurface slant wells would disrupt roughly 6 acres at the CEMEX active mining area for 9 to 18 weeks every 5 years. Further, the effluent produced during slant well cleaning could carry sediment or other contaminants that, if discharged directly to the beach area, could adversely affect water quality in Monterey Bay. As part of routine maintenance of the ASR-5 and ASR-6 Wells, CalAm facility operators would regularly backflush accumulated sediment and turbid water from the two wells. Water produced during routine backflushing would be conveyed to the existing Phase I ASR Pump-to-Waste System. Discharges and land disturbance activities related to periodic maintenance of the subsurface slant wells and routine maintenance of the ASR-5 and ASR-6 Wells would be conducted in accordance with regulatory requirements, such as the General Waiver and the Construction General Permit, designed to protect water quality. Any water quality related impacts would be avoided or minimized to a less-than-significant level.

Facility Siting Impacts

The addition of impervious surfaces or the alteration of drainage patterns (such as through grading) can increase peak stormwater flows, causing erosion or siltation onsite or downstream, increase flood potential, and exceed the capacity of stormwater systems. The subsurface slant wells and portions of the Source Water Pipeline, Castroville Pipeline, and new Transmission Main would be constructed in a 100-year flood hazard area. The near-shore margins of Monterey County, including coastal portions of Marina, Seaside, and Monterey, are subject to flooding in the event of a tsunami. Siting facilities in flood hazard areas can increase the risk of exposing people or structures to loss, injury, or death. The subsurface slant wells, the northernmost portion of the MPWSP Desalination Plant site, and portions of the Source Water Pipeline would be located in areas that could be subject to sea level rise.

Impact 4.3-7: Alteration of drainage patterns such that there is a resultant increase in erosion, siltation, or the rate or amount of surface runoff or an increase in flooding on- or offsite or the exceeding of storm drain capacity.

Implementation of the subsurface slant wells at the CEMEX active mining area would result in a total increase in impervious surface area of approximately 0.7 acres (30,000 square feet). The proposed MPWSP Desalination Plant site would disturb approximately 25 acres of a 46-acre undeveloped parcel, and would add approximately 15 acres (653,400 square feet) of impervious surfaces. The proposed ASR-5 and ASR-6 Wells at the Fitch Park military housing area would add a total or approximately 0.05 to 0.06 acres (2,000 to 2,500 square feet) of impervious surface. The subsurface slant wells, MPWSP Desalination Plant, ASR-5 and ASR-6 Wellswould be subject to the post-construction stormwater management requirements of the municipal stormwater permit and CalAm would be required to implement post-construction stormwater BMPs into the final site designs. With adherence to the post-construction requirements, the existence and operation of these facilities would result in a less than significant impact related to drainage pattern alteration, storm runoff volume, stormwater conveyance capacity, increased soil erosion, and siltation. The Carmel Valley Pump Station would add approximately 600 feet of impervious surfaces and would result in a less than significant impact. No impact would result from implementation of the proposed pipelines.

Impact 4.3-9: Impedance or redirection of flood flows following construction due to the siting of project facilities in a 100-year flood hazard area.

Portions of the Source Water Pipeline, new Transmission Main, and Castroville Pipeline would be constructed in a 100-year flood hazard area. However, these facilities would be placed underground and would not impede or redirect flood flows. The electrical control cabinet at the slant wells would divert flood flows to the sandy areas immediately surrounding the cabinet, still within the CEMEX active mining area, and would not affect other properties or structures. No impact would result from implementation of all other proposed facilities because none of the other components would be located within a 100-year flood hazard area. Therefore, the impact would be less than significant.

Impact 4.3-10: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to a tsunami.

The subsurface slant wells at CEMEX, and the Castroville Pipeline would be located in areas subject to flooding from a tsunami. Because the presence of onsite personnel would be minimal, operation of the subsurface slant wells and pipeline operations and maintenance would not expose personnel or structures to significant risks from flooding in the event of a tsunami. The impact would be less than significant.

Impact 4.3-11: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise.

The subsurface slant wells, the northernmost portion of the MPWSP Desalination Plant site, and portions of the Source Water Pipeline would be located in areas that could be subject to sea level rise. However, because the subsurface slant wells and the two pipelines would be constructed underground and designed to withstand inundation, these facilities would not be subject to a significant risk of damage from flooding due to sea level rise. The aboveground facilities at the proposed Desalination Plant site would be constructed on the upper terrace of the site, at an elevation higher than the predicted year 2100 sea level. It would not expose people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise. The impact would be less than significant for the subsurface slant wells, MPWSP Desalination Plant, and Source Water Pipeline, and Castroville Pipeline. All other proposed facilities would have no impact.

Cumulative Impacts

The geographic scope for potential cumulative surface hydrology and water quality impacts consists of the project area and surrounding Salinas River and Carmel River watershed lands as well as marine waters in Monterey Bay. The analysis of potential cumulative impacts on hydrology and water quality considers those cumulative projects listed in **Table 4.1-2** and shown in **Figure 4-1**.

Nearly every project in the cumulative scenario would be subject to the construction general permit, General Waiver, General WDRs, and other local regulations. With implementation of **Mitigation Measure 4.7-2b** (**Soil and Groundwater Management Plan**) and mandatory compliance with the NPDES Construction General Permit, General Waiver, and General WDRs, residual effects of MPWSP discharges of water extracted during well drilling and development would not be expected to combine with those of projects in the cumulative scenario to cause a significant cumulative impact. Therefore, with implementation of mitigation, the proposed project's contribution to any cumulative impact would be less than significant.

The requirements of NPDES permits, which incorporate the Ocean Plan water quality objectives in the case of operational discharges from the MRWPCA outfall, are designed and intended to protect beneficial uses of receiving waters (i.e., Monterey Bay) from the effects of numerous potential sources of pollution, and are therefore protective against significant adverse cumulative impacts. With mandatory compliance with the regulatory requirements and the NPDES effluent limitations, and implementation of **Mitigation Measure 4.3-4** (**Operational Discharge Monitoring, Analysis, Reporting, and Compliance**) and **Mitigation Measure 4.3-5** (**Implement Protocols to Avoid Exceeding Water Quality Objectives**), the cumulative impact from the discharges resulting from MPWSP and the projects in **Table 4.1-2** is considered less than significant. Additionally, with implementation of mitigation measures, the proposed project's contribution to any cumulative water quality impact in Monterey Bay would be reduced to a level that is less than significant.

Regional alterations to site drainage from multiple projects in the region could cause increased peak flows in creeks, exacerbate erosion and sedimentation, and result in greater non-point source pollution in downstream water bodies. Increased areas of impervious surfaces could also increase flooding of downstream waterways and cause runoff volumes to exceed stormwater conveyance system capacities. Such developments would be required to comply with the Central Coast RWQCB Resolution No. R3-2013-0032, as implemented through the Monterey Regional Stormwater Management Program and NPDES Municipal Stormwater Permit. Further, stormwater requirements are part of a regional program designed to address the potential cumulative effects of past, present, and foreseeable projects within the region; adherence to these requirements would ensure that the alteration of drainage patterns would not cause a significant cumulative impact and the proposed project would result in a less than significant contribution to any cumulative impact.

5.5.3.3 Direct and Indirect Effects of No Project Alternative

Under the No Project Alternative, no construction would occur and no desalination facility would be built and operated. As such, there would be no construction related hydrology and water quality impacts, such as erosion or dewatering discharges. However, decommissioning of the existing test slant well could result in impacts on water quality, including increased soil erosion and the potential for a hazardous chemical release. See Impact 4.3-1, in Section 4.3.5.1. Mandatory compliance with the NPDES Construction General Permit requirements would require the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which would prevent significant construction-related impacts on water quality. The Plan would be required to identify standard Best Management Practices to be implemented to control erosion and reduce sedimentation. Site monitoring by the applicant's erosion-control specialist would be undertaken and a follow-up report would be prepared that documents the progress and/or completion of required erosion-control measures both during and after slant well decommissioning activities. No synthetic plastic mesh products could be used in any erosion control materials. All plans would be required to show that sedimentation and erosion control measures are installed prior to any other ground disturbing work.

Also, no brine would be discharged from the MRWPCA outfall and no impacts related to water quality standards, waste discharge requirements, or water quality would occur as a result of operational discharges. Because no facilities would be constructed, there would be no facility siting impacts related to altered drainage patterns, impervious surfaces, flooding, and flood risks.

Under the No Project Alternative, current diversions from the Carmel River would continue consistent with existing conditions in the short-term. However, under the No Project Alternative, CalAm would not meet Milestone 3 by September 30, 2018 (receipt of a CPCN from the CPUC), nor would it meet the subsequent annual milestones associated with the construction and implementation of the MPWSP. CalAm's Effective Diversion Limit (EDL) from the Carmel River would be reduced under the terms of the Cease and Desist Order (CDO) by 1,000 afy in October 2018, and by an additional 1,000 afy in each subsequent year until October 2021. Beginning in January 2022, as with the Proposed Project, CalAm would only be allowed to divert its legal entitlement of 3,376 afy from the Carmel River. See Section 5.4.2 for details on the amounts of water allowed by the CDO to be diverted each year until the CDO expiration. Therefore, under the No Project Alternative, diversions from the Carmel River would be reduced sooner than under the proposed project and Carmel River flows would be restored with a total of an additional 10,000 acre-feet compared to the proposed project, over the period of October 2018 through 2021. The increases to Carmel River flows under the No Project Alternative compared to the proposed project would be beneficial to Carmel River hydrology, water quality, and aquatic habitat (as determined by the RWQCB as part of Order 95-10). For a more detailed discussion regarding the benefits to Carmel River aquatic habitat and species see Section 5.5.6, Terrestrial Biology.

Cumulative Analysis

In addition to the beneficial effect of increased streamflows in the Carmel River that would occur under the No Project Alternative compared to existing conditions, the GWR Project (No. 59 in **Table 4.1-2**) would provide water supply to CalAm that would further reduce CalAm's diversions from the Carmel River, per the terms of the CDO (SWRCB, 2016a). Specifically, for every acre-foot of GWR Project water supply that CalAm is able to deliver to the Monterey District, CalAm must reduce its Carmel River system diversions by one acre-foot. Therefore, if GWR Project water becomes available to CalAm prior to 2022 (when Carmel River diversions would be limited to the 3,376 afy legal limit regardless of other water sources), CalAm's diversions from the Carmel River would be reduced compared to those described in **Table 5.4-3**, leaving more streamflow in the Carmel River than under the No Project Alternative alone. This would be a cumulative beneficial less than significant effect on streamflows in the Carmel River.

5.5.3.4 Direct and Indirect Effects of Alternative 1 – Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.4.3). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**). Therefore, the surface water hydrology and water quality impact analysis of Alternative 1 focuses primarily on the intake system and source water pipeline that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 1. Components that are common to both Alternative 1 and the proposed project are assessed in Section 4.3, Surface Water Hydrology and Water Quality.

Construction Impacts

Components unique to Alternative 1 would have a smaller disturbance area at the Potrero Road parking lot (1 acre) as compared to the proposed project at CEMEX (9 acres), but Alternative 1 would also include an additional 5.5 miles of source water pipeline. Overall, based on the additional 5.5 miles of pipeline under Alternative 1, the construction footprint would be increased as compared to the proposed project. Therefore, Alternative 1 would result in an increased potential for soil erosion and risk of inadvertent releases of hazardous chemicals during general construction activities. Alternative 1 would also have an increased potential for eroded soil and sediment to be transported down gradient via stormwater runoff and degrade the water quality of receiving water bodies, including the Salinas River and Monterey Bay. Mandatory compliance with NPDES Construction General Permit and local grading requirements would involve implementation of a SWPPP, including stormwater BMPs as well as erosion and stormwater control measures, which would prevent substantial adverse effects on water quality during construction. Alternative 1 construction impacts related to the degradation of water quality associated with increased soil erosion and inadvertent releases of hazardous chemicals during general construction activities would result in the ***same impact conclusion*** as the proposed project, less than significant.

Construction-related discharges of dewatering effluent from open excavations and water produced during well drilling of the slant wells would be increased under Alternative 1 because of the increased number of new wells at Potrero Road compared to the proposed project (10 new wells versus 9 new wells and the converted test well at CEMEX) and the 5.5 miles of additional source water pipeline. Most of the dewatering effluent produced during construction excavation is considered a low threat and would be discharged to land or the stormwater drainage system provided it complies with the *General WDRs for Discharges with a Low Threat to Water Quality.* The development water produced during well installation would be pumped to holding tanks to allow sediment to settle out and effluent would be discharged to a buried diffuser system in the parking lot for percolation into underlying beach sands in accordance with the requirements of the General Waiver of WDRs (General Waiver). Impacts from discharges of contaminated dewatering effluent from open excavations and well development that do not meet General Waiver requirements would be reduced to a less-than-significant level with implementation of the same mitigation prescribed for the proposed project, **Mitigation Measure 4.7-2b: Soil and Groundwater Management Plan**. Alternative 1 construction impacts related to the degradation of water quality from construction-related discharges of dewatering effluent from open excavations and water produced during well drilling and development would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Degradation of water quality from discharges of treated water and disinfectant during construction of Alternative 1 could be increased compared to the proposed project because of the additional 5.5 miles of new pipeline. Like the proposed project however, adherence to the General Waste Discharge Requirements would ensure the degradation of water quality from discharges of treated water and disinfectant from existing and newly installed pipelines during construction would result in the ***same impact conclusion*** as the proposed project, less than significant.

During construction of Alternative 1, the potential for grading and earthmoving operations to alter local drainage patterns and redirect or concentrate stormflows would be increased due to the additional 5.5 miles of pipeline. Such an increased potential for altered drainage patterns could result in increased risks related to onsite and/or downstream (offsite) erosion, siltation, and flooding, especially if stormwater conveyance capacity is exceeded. Mandatory compliance with NPDES Construction General Permit requirements and local regulations would involve implementation of erosion and stormwater control measures which would ensure the potential for impacts related to altered drainage patterns during construction would result in the ***same impact conclusion*** as the proposed project, less than significant.

Operational Impacts

Operation and maintenance of Alternative 1 would include the same activities as the proposed project. The source water would be the same as the proposed project in terms of water quality characteristics. The brine discharge system and volume of discharge would be the same as the proposed project, and, therefore, impacts would be the same as described in Section 4.3. Discharges would not increase salinity levels in violation of water quality standards or waste discharge requirements, nor otherwise degrade the water quality of receiving waters in Monterey Bay as a result of increased salinity.

Alternative 1 would be subject to the same mitigation as defined for the proposed project, which requires development and approval of a monitoring and reporting plan, consistent with the requirements of the Ocean Plan and MBNMS guidelines, prior to construction and operation. **Mitigation Measure 4.3-4** (**Operational Discharge Monitoring, Analysis, Reporting, and Compliance**) would ensure compliance with the monitoring requirements and regulatory standards that are protective of the beneficial uses (including aquatic wildlife and habitat) of Monterey Bay. The monitoring and reporting plan would set forth appropriate response thresholds as well as corrective actions (defined in **Mitigation Measure 4.3-5**) that would be required if the acquired data indicated deleterious effects on receiving water quality or marine resources from discharges. **Mitigation Measure 4.3-4** would minimize or avoid any potential adverse effects from increased salinity (including hypoxia); therefore, Alternative 1 would result in the ***same impact conclusion*** related to increased salinity as the proposed project, less than significant with mitigation.

Like the proposed project, no heating mechanism or process would increase the temperature of the source water as it passes through the desalination process. Alternative 1 would not increase the temperature of the discharged effluent in a manner inconsistent with the requirements of the SWRCB Thermal Plan and impacts relating to temperature would be the same as the proposed project. However, as described for the proposed project, because constituent concentrations could become elevated to levels greater than 80 percent of the Ocean Plan water quality objectives for ammonia and cyanide for some operational discharge scenarios (when low wastewater volumes are co-mingled with the brine), and there is not enough information to assess concentrations at the edge of the ZID for an additional thirteen constituents due to differences in MRLs used to assess the source waters or due to MRLs being higher than Ocean Plan objectives, it is conservatively concluded that Ocean Plan water quality objectives could potentially be exceeded during operations for some operational discharge scenarios, resulting in a significant impact. With the implementation of **Mitigation Measure 4.3-5** (**Implement Protocols to Avoid Exceeding Water Quality Objectives,** described in detail in Section 4.3.5.3), impacts related to the violation of regulatory standards and discharge requirements or the degradation of water quality under Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

As described for the proposed project, the routine maintenance of subsurface slant wells and the ASR-5 and ASR-6 Wells would be conducted in accordance with regulatory requirements, such as the General Waiver and Construction General Permit, designed to protect water quality. Alternative 1 impacts related to the degradation of water quality due to discharges associated with maintenance of wells would result in the ***same impact conclusion*** as the proposed project, less than significant.

Facility Siting Impacts

Under Alternative 1, the disturbance area for maintenance of the slant wells at Potrero Road would be less than that of the proposed project (less than 1 acre at Potrero Road compared to 9 acres at CEMEX) and impervious surfaces for the slant wells would also be reduced (1,250 square feet compared to approximately 30,000 square feet for the proposed project). Therefore, Alternative 1 impacts related to the alteration of drainage patterns such that there is a resultant increase in erosion, siltation, flooding on- or offsite or the exceeding of storm drain capacity would result in a slightly reduced level of impact as compared to the proposed project. With adherence to post-construction stormwater management requirements and post-construction stormwater BMPs, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Under Alternative 1, impacts related to flooding and flood risks, including those from tsunami and sea level rise would result in a slightly reduced level of impact than the proposed project due to the slant wells at Potrero Road not being located in a 100-year flood hazard area (whereas the proposed project slant wells at CEMEX would be within the 100-year flood zone) and also being set further inland behind the coastal dunes. Alternative 1 would result in the ***same impact conclusion*** associated with flooding and flood risks compared to the proposed project, less than significant.

Cumulative Analysis

Cumulative impacts from construction and operation of Alternative 1 would be the same as those described for the proposed project (which includes consideration of the Deep Water Desal Project), as analyzed in Section 4.3.6, Surface Water Hydrology and Water Quality. Like the proposed project, Alternative 1 could contribute to significant cumulative surface water hydrology and water quality impacts, but with implementation of **Mitigation Measures 4.7-2b**, **4.3-4** and **4.3-5**, would have a less than significant contribution to such cumulative impacts (*less than significant with mitigation*).

5.5.3.5 Direct and Indirect Effects of Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a screened open-water intake system consisting of an intake structure located offshore on the seafloor in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station that would be constructed on 3,600 square feet at Dolan Road (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to Castroville Community Services District would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**). Therefore, the analysis of Alternative 2 hydrology and water quality impacts focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 2. Components that are common to both Alternative 2 and the proposed project are assessed in Section 4.3, Surface Water Hydrology and Water Quality.

Construction Impacts

Components unique to Alternative 2 would have a reduced onshore construction disturbance area compared to the proposed project. While the open-water intake system and an additional 6.5 miles of source water pipeline are proposed under Alternative 2, pipelines required for the return of source water that originated in the Salinas Valley Groundwater Basin would not be implemented. Like the proposed project, Alternative 2 would have 21 miles of total pipeline. Further, the land-based construction area of the intake system pump station (0.08 acres) would be less than the 9 acres associated with the slant wells at CEMEX. For land-based construction, mandatory compliance with NPDES Construction General Permit and local grading requirements, including implementation of a SWPPP and stormwater BMPs as well as erosion and stormwater control measures, would prevent substantial adverse effects on water quality during land-based construction. Alternative 2 construction impacts related to the degradation of water quality associated with soil erosion and inadvertent releases of hazardous chemicals during general land-based construction activities would result in the ***same impact conclusion*** as the proposed project, less than significant.

Construction of the open-water intake on the seafloor (versus the proposed project's subsurface intake system) would result in an increased level of impact for construction related water quality impacts within MBNMS because the proposed project would not involve any construction on the seafloor. Water quality impacts associated with construction of the open water intake would include direct disturbance of the seafloor and associated water quality degradation in the form of increased turbidity and the potential release of drilling fluids where the Horizontal Directional Drilling technique of the intake pipeline breaks through the seafloor, and where the seafloor is prepared/graded for the placement of the intake structure. However, any disturbance of the seafloor and resulting increased turbidity would be temporary and short-term in nature (i.e. not chronic or ongoing), occurring only during the construction period, and would be highly localized in extent, occurring only within and immediately adjacent to the construction area at the intake pipeline terminus and where the seafloor is prepared for the intake structure. Any drilling fluids released would be environmentally inert and biodegradable. Water quality would return to ambient conditions following completion of construction activities as a result of the settling of suspended sediment and mixing and dilution driven by wave action and tidal current. Therefore, Alternative 2 would result in an increased level of impact compared to the proposed project because the proposed project would not have any in-water construction. However, because of the temporary and localized nature of the in water construction impacts, Alternative 2 would result in an ***increased impact conclusion*** compared to the proposed project, less than significant.

Construction-related discharges of dewatering effluent from open excavations would be the same under Alternative 2 as the proposed project since the 21 total miles of pipeline constructed would be the same (the additional 6.5 additional miles of source water pipeline and the elimination of the pipelines related to return water). Most of the dewatering effluent produced during construction excavation would be discharged to land or the stormwater drainage system in compliance with the *General WDRs for Discharges with a Low Threat to Water Quality*. Impacts from discharges of contaminated dewatering effluent from open excavations that do not meet requirements of the General WDRs would be reduced to a less-than-significant level with implementation of the same mitigation prescribed for the proposed project, **Mitigation Measure 4.7-2b** (**Soil and Groundwater Management Plan**). Alternative 2 impacts related to the degradation of water quality from construction-related discharges of dewatering effluent from open excavations would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Degradation of water quality from discharges of treated water and disinfectant during construction of Alternative 2 would be the same as the proposed project. Like the proposed project, adherence to the General WDRs would ensure impacts related to the degradation of water quality from discharges of treated water and disinfectant from existing and newly installed pipelines during construction would result in the ***same impact conclusion*** as the proposed project, less than significant.

During construction of Alternative 2, the potential for grading and earthmoving operations to alter local drainage patterns and redirect or concentrate stormflows would be reduced due to the intake pump station resulting in less land disturbance than the 9 acres for the slant wells under the proposed project. As with the proposed project, mandatory compliance with NPDES Construction General Permit requirements and local regulations would involve implementation of erosion and stormwater control measures which would ensure the potential for impacts related to altered drainage patterns during construction would result in the ***same impact conclusion*** as the proposed project, less than significant.

Operational Impacts

Under Alternative 2, the salinity of the brine would be the same as that described for the proposed project and the brine would be mixed with MRWPCA wastewater, when available, in the same volumes as described for the proposed project. Operational discharges would be discharged via the existing diffuser and subject to the same mixing and dilution dynamics as described for the proposed project.

Alternative 2 would be subject to the same mitigation as defined for the proposed project, which requires development and approval of a monitoring and reporting plan, consistent with the requirements of the Ocean Plan and MBNMS guidelines, prior to construction and operation. **Mitigation Measure 4.3-4** (**Operational Discharge Monitoring, Analysis, Reporting, and Compliance**) would ensure compliance with the monitoring requirements and regulatory salinity standards that are protective of the beneficial uses (including aquatic wildlife and habitat) of Monterey Bay. The monitoring and reporting plan would set forth appropriate response thresholds as well as corrective actions (defined in **Mitigation Measure 4.3-5**) that would be required if the acquired data indicated deleterious effects on receiving water quality or marine resources from discharges. **Mitigation Measure 4.3-4** would minimize or avoid any potential adverse effects from increased salinity (including hypoxia); therefore, Alternative 2 would result in the ***same impact conclusion*** related to increased salinity compared to the proposed project, less than significant with mitigation.

As with the proposed project, no heating mechanism or process would increase the temperature of the source water as it passes through the desalination process, and Alternative 2 would not increase the temperature of the discharged effluent in a manner inconsistent with the requirements of the SWRCB Thermal Plan and impacts relating to temperature would be the ***same*** as the proposed project; no impact.

As described for the proposed project, because constituent concentrations could become elevated to levels greater than 80 percent of the Ocean Plan water quality objectives for ammonia and cyanide for some operational discharge scenarios (when low wastewater volumes are co-mingled with the brine), and there is not enough information to assess concentrations at the edge of the ZID for an additional thirteen constituents due to differences in MRLs used to assess the source waters or due to MRLs being higher than Ocean Plan objectives, it is conservatively concluded that Ocean Plan water quality objectives could potentially be exceeded during operations for some operational discharge scenarios, resulting in a significant impact. With the implementation of Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives, described in detail in Section 4.3.5.3), impacts related to the violation of regulatory standards and discharge requirements or the degradation of water quality under Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Furthermore, as described in Section 4.3, Surface Water Hydrology and Water Quality, the concentration of polychlorinated biphenyls (PCBs) in Monterey Bay currently exceeds Ocean Plan water quality objectives under baseline conditions. Unlike the proposed project's use of subsurface slant wells, the open water intake under Alternative 2 would not pre-filter the PCBs through the seafloor and concentrations of the existing PCB-levels would expectedly increase in the brine discharge as compared to the proposed project. Because brine-only discharges form a dense sinking plume with low minimum dilution, increased concentrations of PCBs in the brine discharges would result in an increased level of impact compared to the proposed project. Unlike the proposed project, Alternative 2 could potentially exceed the Ocean Plan water quality objective for PCBs at the edge of the ZID. However, with the implementation of Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives) impacts related to the violation of regulatory standards and discharge requirements or the degradation of water quality under Alternative 2 would result in the same impact conclusion as the proposed project, less than significant with mitigation.

Under Alternative 2, maintenance activities would be the same as those described for the proposed project, except for the new open-water intake in MBNMS. Maintenance of the new open-water intake structure and pipeline would be conducted annually and would result in a temporary short-term disturbance to the seafloor in the area immediately surrounding the intake structure, resulting in localized increases in turbidity. The material removed during intake screen cleaning and pipeline maintenance would be released into the ocean at the well screens and at the end of the intake pipeline, and could also contribute to temporary and localized increased turbidity. Water quality would return to ambient conditions following completion of maintenance activities as a result of the settling of suspended sediment and mixing and dilution driven by wave action and tidal current. Therefore, this would result in an increased level of impact compared to the proposed project because the proposed project proposes no in-water maintenance activities. However, while the impact on water quality would be localized and temporary, Alternative 2 would result in an ***increased impact conclusion*** compared to the proposed project, less than significant.

Facility Siting

Under Alternative 2, the total impervious area would be reduced compared to the proposed project (0.08 acres for the Dolan Road intake pump station compared to 9 acres for slant wells at CEMEX). Therefore, Alternative 2 would result in a reduced level of impact compared to the proposed project on the alteration of drainage patterns such that there is a resultant increase in erosion, siltation, flooding on- or offsite or the exceeding of storm drain capacity. With adherence to post-construction stormwater management requirements and post-construction stormwater BMPs, Alternative 2 would result in the ***same impact conclusion*** compared to the proposed project, less than significant.

Under Alternative 2, impacts related to flooding and flood risks, including those from tsunami and sea level rise would have a similar level of impact as the proposed project due to the intake pump station being located in the coastal zone, similar to the slant wells at CEMEX. Subsurface pipelines would have the same level of impact as the proposed project regarding flood hazards. Impacts associated with flooding and flood risks under Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

Cumulative impacts from construction of Alternative 2 would be the same as those described for the proposed project, with the exception of the construction of the open-water intake facility and longer source water pipeline; Alternative 2, like the proposed project, would use the existing MRWPCA outfall. The DeepWater Desal Project (No. 34 in **Table 4.1-2** in Section 4.1) also would include construction of a new open-water intake and new outfall pipelines at Moss Landing that would result in the same type of localized water quality degradation described for Alternative 2. It is unlikely that both open water intake facilities would be constructed at the same time, but conservatively assuming this would occur, it is unlikely that in-water construction activities could result in a significant cumulative impact on surface water quality. Like Alternative 2, the DeepWater Desal Project would result in elevated turbidity and disturbance of the sea floor in a localized area (i.e. the area comprising the construction footprint and immediate surroundings). Further, any disturbance of the seafloor and increased associated turbidity would be temporary and short-term in nature (i.e. not chronic or ongoing), occurring only during the construction period, and would be highly localized in extent, occurring only within and immediately adjacent to the construction area at the intake pipeline terminus and where the seafloor is prepared for the intake structure. Water quality would return to ambient conditions following completion of construction activities as a result of the settling of suspended sediment and mixing and dilution driven by wave action and tidal current. The potential contribution to cumulative surface water quality impacts from construction of Alternative 2 would be increased compared to the proposed project, but the impact of Alternative 2's contribution would be less than significant.

The increased concentration of PCBs in the brine discharge from Alternative 2 may exceed the Ocean Plan water quality objective for PCBs at the edge of the ZID and would result in a potentially significant impact; however, as described for the proposed project, all existing and proposed outfalls associated with the cumulative projects (same as listed in Section 4.3.6) are greater than 0.26 mile from the MRWPCA outfall. Therefore, the likelihood of discharge plumes from different outfalls or their ZIDs intersecting (the ZID for the proposed project extends up to 39 feet from the outfall, as would occur under Alternative 2) or merging and resulting in exceedances of Ocean Plan defined water quality objectives and adversely affecting beneficial uses of receiving waters (Monterey Bay) is very low. Similar to the proposed project, the impact of Alternative 2's contribution would be significant, but this contribution would be minimized to a level that is not cumulatively significant with implementation of **Mitigation Measure 4.3-4** (**Operational Discharge Monitoring, Analysis, Reporting, and Compliance**) and **Mitigation Measure 4.3-5** (**Implement Protocols to Avoid Exceeding Water Quality Objectives**) (*less than significant with mitigation*).

The contribution to less than significant cumulative surface water quality impacts from maintenance of Alternative 2 would be increased compared to the proposed project. Maintenance of the open-water intake would contribute to temporary and localized increased turbidity. Similarly, maintenance of the DeepWater Desal Project open water intake could result in additional turbidity. However, given the size and volume of Monterey Bay, any temporary increases in turbidity associated with maintenance activities would result in a less than significant cumulative impact.

5.5.3.6 Direct and Indirect Effects of Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. Under Alternative 3, a new 22 mgd desalination plant and co-located data center (110 acres) at “East Tank Farm Parcel” off Dolan Road would be constructed. The pipelines for the intake and brine discharge systems would be installed using HDD. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the “Connection to CalAm” Point on **Figure 5.4-3**, ASR-5 and 6 wells and ASR pipelines, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**). Therefore, the surface water hydrology and water quality impact analysis of Alternative 3 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 3. Components that are common to both Alternative 3 and the proposed project are assessed in Section 4.3, Surface Water Hydrology and Water Quality.

Construction Impacts

Components unique to Alternative 3 would have a larger disturbance area as compared to the proposed project (110 acres for the desalination facility and data center with 31.5 miles of additional pipeline compared to 25 acres for the proposed project desalination facility and 21 miles of pipeline). Therefore, construction of Alternative 3 would have an increased potential for soil erosion and risk of inadvertent releases of hazardous chemicals during general construction activities. Alternative 3 would also have an increased potential for eroded soil and sediment to be transported down gradient via stormwater runoff and degrade the water quality of receiving water bodies, including Monterey Bay. As with the proposed project, mandatory compliance with NPDES Construction General Permit and local grading requirements would involve implementation of a SWPPP, including stormwater BMPs as well as erosion and stormwater control measures, which would prevent substantial adverse effects on water quality during construction. Impacts from land-based construction would be increased compared to the proposed project, and, Alternative 3 would result in the ***same impact conclusion*** compared to the proposed project related to the degradation of water quality associated with increased soil erosion and inadvertent releases of hazardous chemicals during general construction activities, less than significant.

Further, offshore in MBNMS, Alternative 3 would result in approximately 16,700 square feet (about 0.4 acre) of disturbance on the seafloor from construction of an open-ocean intake (3,300 square feet) and brine discharge pipeline and diffusers (13,400 square feet); this would be an increased level of impact compared to the proposed project which proposes no construction on the seafloor. Further, since Alternative 3 would include four pipes, intake structures, and a brine discharge structure, the volume of drilling fluids required for HDD installation would be increased compared to the proposed project (which proposes no in-water construction activities) and Alternative 2 (which proposes only one pipe and one intake structure). Discharges of water produced during installation of the open-water intake would be conducted in accordance with the General Construction Waiver. Due to the substantial size of the Alternative 3 in-water seafloor construction area compared to Alternative 2 (16,700 square feet including an intake and a brine discharge structure versus 3,300 square feet for an intake structure; the proposed project would have no seafloor construction), the two subsurface brine and two subsurface intake pipelines that break through the seafloor in MBNMS (compared to none for the proposed project), and the current lack of available details regarding construction methods, techniques designed to avoid or minimize the degradation of water quality and timing of construction, Alternative 3 would result in an ***increased impact conclusion*** compared to the proposed project related to the degradation of water quality associated with increased soil erosion and inadvertent releases of hazardous chemicals during general construction activities, significant and unavoidable.

Construction-related discharges of dewatering effluent from open excavations would be increased under Alternative 3 because of the larger disturbance area associated with the desalination facility (110 acres versus 25 for the proposed project) and increased pipeline length (31.5 miles in addition to the 21 miles for the proposed project). Most of the dewatering effluent produced during construction excavation is considered a low threat and would be discharged to land or the stormwater drainage system provided it complies with the *General WDRs for Discharges with a Low Threat to Water Quality*. Impacts from discharges of contaminated dewatering effluent from open excavations and well development that do not meet General Waiver requirements could be reduced to a less-than-significant level with implementation of mitigation similar to that prescribed for the proposed project, **Mitigation Measure 4.7-2b** (**Soil and Groundwater Management Plan**). Therefore, Alternative 3 would result in the ***same impact conclusion*** related to construction impacts and degradation of water quality from construction-related discharges of dewatering effluent from open excavations as the proposed project, less than significant with mitigation.

Degradation of water quality from discharges of treated water and disinfectant during construction of Alternative 3 would be increased compared to the proposed project because of the additional miles of new pipeline (31.5 miles in addition to 21 miles for the proposed project). Like the proposed project however, adherence to the General Waste Discharge Requirements would ensure the degradation of water quality from discharges of treated water and disinfectant from existing and newly installed pipelines during construction. Therefore, Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant.

During construction of Alternative 3, the potential for grading and earthmoving operations to alter local drainage patterns and redirect or concentrate stormflows would be increased compared to the proposed project due to the larger disturbance area associated with the desalination facility (110 acres versus 25 for the proposed project) and increased pipeline length (31.5 additional miles). Such an increased potential for altered drainage patterns could result in increased risks related to onsite and/or downstream (offsite) erosion, siltation, and flooding, especially if stormwater conveyance capacity is exceeded. Mandatory compliance with NPDES Construction General Permit requirements and local regulations would involve implementation of erosion and stormwater control measures which would ensure the potential for impacts related to altered drainage patterns during construction would result in the ***same impact conclusion*** as the proposed project, less than significant.

Operational Impacts

Operational discharges would be released into MBNMS through a new diffuser structure without blending with wastewater. Discharge volumes would be greater than the proposed project (26 mgd versus 14 mgd) and the co-located data center would increase the temperature of the brine by about $+10^0$ C (the discharge from the proposed project would not gain heat). Impacts on water quality were assessed for salinity, temperature, and other Ocean Plan constituents.

Salinity Impacts

Alternative 3 would operate a 25-mgd desalination facility with a 46 percent recovery rate; it would need 55-mgd of source water and would produce a maximum of 27-mgd of brine with a maximum salinity of 66 ppt (compared to 58 ppt for the propose project). The brine would be discharged via a new outfall diffuser with five high velocity duckbill diffuser nozzles (**Appendix D1** provides a discussion of diffuser nozzles). Operational discharges from Alternative 3 would locally increase salinity levels within the BMZ and could violate water quality standards or waste discharge requirements or otherwise degrade the water quality of receiving waters (including hypoxia) in Monterey Bay. The result would be an increased level of impact compared to the proposed project that could be mitigated to less than significant.

Approach to Analysis

Jenkins (2016) assessed the potential impacts of the DeepWater Desal Project from increased salinity against Ocean Plan water quality objectives. The analysis of brine dilution and characterization of salinity increases from discharges was performed using two models: a near field mixing zone model certified by the U.S. Environmental Protection Agency for use in ocean outfall design (detailed in Section 4.3, Surface Water Hydrology and Water Quality); and a 3-dimensional far field dispersion model. These models were used to characterize dilution and salinity, based on the mixing dynamics of a single discharge nozzle, to predict the trajectory of the brine plume following initial dilution in the nearfield of the diffuser, and to assess dilution and salinity increases from the interaction of brine plumes simultaneously discharged through five proposed outfall diffuser nozzles. The salinity increases determined by the modeling are worst-case and would occur only along the seabed (the location of the highest and most conservative salinity levels) as a reflection of the negatively buoyant discharge (discussed in detail in Section 4.3, Surface Water Hydrology and Water Quality); salinity levels decrease with height in the water column. Therefore, the model analysis completed by Jenkins (2016) represents conservative (i.e., worst-case) salinity increases from operational discharges associated with Alternative 3; in the majority of the water column, incremental salinities would be much less than the reported values.

The models used long-term records of water quality, ocean climate, bathymetry, and meteorological conditions to reflect baseline conditions and ambient receiving water quality appropriate to assessing impacts from operational discharges. Model analyses were conducted to determine salinity increases as short-term maximum values representative of periods of mixing and transport in the local ocean environment when brine dilution would be expected to occur at lowest rates. The low mixing conditions reflect the three ocean climates: upwelling period, relaxation period, and Davidson period (detailed in Section 4.3, Surface Water Hydrology and Water Quality). Additionally, model analysis determined average incremental salinity increases over the long-term (20+ years).

Salinity Impact Results and Discussion

The model analysis by Jenkins (2016) assumed discharges of brine via five diffuser nozzles, each discharging at 5.45 mgd for a combined discharge of 27.26 mgd with a maximum brine salinity of 66.15 ppt at the diffuser. Ambient ocean salinity was assumed to be 33.4 ppt based on the 20 year average salinity record. The dilution results determined that a single diffuser nozzle would dilute brine to within 2 ppt of natural background salinity at a distance of 105 feet from the point of discharge. Additionally, the analysis determined that a single 5.45 mgd diffuser nozzle would achieve dilution of the brine to within 0.1 percent over natural background salinity of 33.4 ppt at the edge of the BMZ (a distance of 328 feet from the point of discharge); thus, discharges would be within the 2 ppt salinity standard defined in the Ocean Plan.

The 3-dimensional model analysis by Jenkins (2016) for each of the three ocean climates determined that the discharge plume characterized by salinity of 2 ppt or greater would extend to a distance of 312 to 315 feet from the diffuser, slightly less than the perimeter of the BMZ (328 feet). The 3-dimensional model analysis also determined that an area of up to 0.6 acres around the outfall diffuser along the seafloor would be characterized by salinities up to 42 ppt, representing an incremental increase of approximately 8.5 ppt.

Long-term model analysis was also conducted to determine average salinity increases and Ocean Plan compliance. Results determined that the median salinity at the edge of the BMZ would be 33.94 ppt assuming an ambient receiving water salinity of 33.39 ppt, within the Ocean Plan objective of 2 ppt. The model analysis determined that 99.9 percent of the time (based on 8,149 model simulations), salinity at the edge of the BMZ would be equal to or less than 35.39 ppt (representing the 2 ppt Ocean Plan objective). A maximum salinity of 35.54 (0.15 ppt above ambient) at the edge of the BMZ was determined to occur during the Davidson current period worst-case condition, when ambient ocean salinity exceeded the 20-year average (natural background) salinity. The probability of occurrence of this over-limit is less than 0.08 percent, or about 1 day in 3.4 years. As described above, while model simulations have identified short-term minor (0.15 ppt) exceedances of the 2 ppt threshold, such exceedances are based on worst-case model simulations and may not occur under actual operational conditions. Additionally, the salinity increases would occur only along the seabed (the location of the highest and most conservative salinity levels) as a reflection of the negatively buoyant dense operational discharges; salinity levels decrease with height in the water column and would be less than the reported values.

Salinity Impact Summary and Conclusion

Salinity increases would be greater under Alternative 3 compared to the proposed project. Under Alternative 3, a larger desalination facility (22 mgd as compared to 9.6 mgd for the proposed project) would discharge a greater volume of brine (27 mgd of brine as compared to 14 mgd of brine for the proposed project) with a higher maximum salinity (66.2 ppt as compared to 58.2 ppt for the proposed project). The area where salinity levels exceed 2 ppt around the Alternative 3 outfall diffuser would extend up to 315 feet, almost to the boundary of the BMZ (328 feet from the diffuser) and would be greater, as would the potential for hypoxia, than that described for the proposed project (salinity levels would be less than 2 ppt at a distance of up to 39 feet from the diffuser). Model analysis (Jenkins, 2016) identified discharges from Alternative 3 would occasionally (1 day out of 3.4 years) exceed the significance threshold of 2 ppt above natural background salinity at the BMZ boundary by a small margin (i.e., by 0.15 ppt).

As described in detail in Section 4.3.2.2 for the proposed project, the Ocean Plan includes monitoring and reporting requirements for the operation of new desalination facilities (Section III.M.4, “Monitoring and Reporting Program”; SWRCB, 2016b). A monitoring and reporting plan has not been defined and proposed as part of Alternative 3; as such and similar to the proposed project, Alternative 3 would not be consistent with the Plans, Policies, and Regulations described in Section 4.3, Surface Water Hydrology and Water Quality. This would be a significant impact and would result in an increased level of impact compared to the proposed project, which could be reduced to less than significant with the implementation of a monitoring and mitigation plan consistent with Ocean Plan requirements that defines clear performance standards and feasible corrective actions linked to the defined performance standards substantially similar to **Mitigation Measure 4.3-4** (but revised specific to the Alternative 3 project final design and defined operating conditions). Therefore, Alternative 3 would result in the ***same impact conclusion*** for salinity compared to the propose project, less than significant with mitigation.

Temperature Impacts

As described in Section 4.3.2, the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan) contains water quality objectives relevant to operational discharges that may elevate the temperature of receiving waters. The Thermal Plan specifies that the maximum temperature of discharges shall not exceed the natural temperature of receiving waters by more than 20°F, and the discharge of elevated temperature wastes shall not result in increases in the natural water temperature exceeding 4°F at: (a) the shoreline; (b) the surface of any ocean substrate; or (c) the ocean surface beyond 1,000 feet from the discharge system. The surface temperature limitation must be maintained at least 50 percent of the duration of any complete tidal cycle. This impact analysis uses the Thermal Plan’s receiving water temperature limitations as significance thresholds.

Because the desalination source water would be used to cool a data center before entering the desalination facility, the temperature of the brine discharge would be increased up to 10°C (18°F) over ambient receiving ocean water temperature before being released into Monterey Bay (Jenkins, 2016). Based on model analysis, a median temperature difference of 0.11°C (0.2°F) would occur on the seabed at a distance of 328 feet from the outfall diffuser (Jenkins, 2016). The maximum temperature increase near the seabed at a distance of 328 feet from the outfall diffuser would be 0.96°C (1.73°F). The maximum modeled temperature increase is less than the natural temperature variations that occur daily at a depth of 65 feet. This would be an increased level of impact compared to the proposed project since the proposed project (or any other alternatives') discharge would not have any heat gain. Based on the temperature model results for the dispersion of the heated brine effluent, discharges would not exceed temperature related significance thresholds. Therefore, Alternative 3 would result in an ***increased impact conclusion*** for temperature impacts compared to the proposed project, and would be less than significant.

Other Ocean Plan Constituents

Brine discharges from Alternative 3 would not be combined with wastewater effluent, such as described for the proposed project. Therefore, Alternative 3 discharges are unlikely to exceed the numeric Ocean Plan objectives provided in **Table 4.3-4** for most of the listed water quality constituents because most of the listed constituents originate in wastewater. However, as described in Section 4.3, Surface Water Hydrology and Water Quality, the concentration of polychlorinated biphenyls (PCBs) in Monterey Bay exceeds Ocean Plan water quality objectives under baseline conditions. Unlike the proposed project's use of subsurface slant wells, the open water intake would not pre-filter the PCBs through the seafloor. As such, the source water for the desalination process would be out of compliance with the Ocean Plan numeric Water Quality Objectives (WQO) for PCBs prior to processing at the desalination facility. The nature of reverse osmosis treatment results in the concentration of existing constituents (such as salinity). Therefore, the concentration of the existing PCB-levels through the desalination process would be expected to further increase the PCB-levels in the brine discharge and therefore, exceed the Ocean Plan WQO upon discharge. Also, because brine discharges form a sinking plume and minimum dilution values are typically low, increased concentrations of PCBs in the brine would result in an increased level of impact compared to the proposed project and unlike the proposed project, Alternative 3 could potentially exceed the Ocean Plan water quality objective for PCBs at the edge of the ZID. The average concentration of PCBs observed in receiving the ocean waters of Monterey Bay is 2.32 nanograms per liter (ng/L) as determined through the CCLEAN program. This PCB concentration is already greater under baseline conditions than the Ocean Plan objective of 0.019 ng/L (**Table 4.3-4**). Assuming a concentration factor of 1.85, representing a recovery rate of 46 percent for the Alternative 3 desalination facility, an in-pipe brine PCB concentration of 4.29 ng/L was calculated. This concentration of PCB in the desalination brine would result in a concentration at the edge of the ZID of 2.68 ng/l based on a dilution factor of 20:1 (parts seawater to effluent). Therefore, Alternative 3 would have the potential of a 15.5 percent increase at the edge of the ZID compared to ambient ocean conditions, causing an exceedance of the Ocean Plan water quality objective for PCBs, resulting in an increased level of impact compared to the proposed action and a potentially significant impact. However, with implementation of mitigation substantially similar to **Mitigation Measure 4.3-5** (**Implement Protocols to Avoid Exceeding**

Water Quality Objectives), but revised specific to the Alternative 3 project final design and defined operating conditions, the significant impact would be reduced to a less-than-significant level and therefore, Alternative 3 would result in the ***same impact conclusion*** on other Ocean Plan constituents compared to the proposed project, less than significant with mitigation.

Maintenance Activities

Under Alternative 3, open water intake facility maintenance would involve regular cleaning from a boat using an automatic airburst connection and would not disturb the ocean floor. Periodic maintenance of the intake pipelines would temporarily increase turbidity in the immediate area surrounding the intake, but dilution, dispersion, and dynamic mixing by waves and tidal currents would result in turbidity levels rapidly reducing to ambient levels. Alternative 3 would therefore, have an increased potential to degrade of water quality due to discharges associated with maintenance of the intake. However, the impacts would be temporary and localized and Alternative 3 would result in the ***same impact conclusion*** as the proposed project; less than significant.

Facility Siting Impacts

Under Alternative 3, impervious surfaces would be increased by approximately 36 acres compared to the 15 acres for the proposed project. Impacts related to the alteration of drainage patterns, the amount of surface runoff, increases in flooding, erosion, siltation, or exceed storm drain capacity on or off-site would result in an increased level of impact compared to the proposed project. As for the proposed project, Alternative 3 would be subject to the post-construction stormwater management requirements of the municipal stormwater permit and the applicant would be required to implement post-construction stormwater BMPs into the final site designs. With adherence to the post-construction requirements, impacts related to drainage pattern alteration, storm runoff volume, stormwater conveyance capacity, increased soil erosion, and siltation associated with Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Under Alternative 3, impacts related to flooding and flood risks, including those from tsunami and sea level rise would result in a slightly reduced level of impact compared to the proposed project due to the inland location of the desalination facility and data center. Impacts associated with flooding and flood risks under Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant.

The MBNMS Desalination Guidelines (NOAA, 2010) state: “project proponents should investigate the feasibility of diluting brine effluent by blending it with other existing discharges.” Although a combined discharge currently is not proposed for Alternative 3, the DeepWater Desal Project proponent is investigating the feasibility of diluting brine effluent by blending it with Moss Landing Power Plant cooling water through a combined discharge. If proposed by DeepWater Desal, the separate EIR/EIS for the DeepWater Desal Project will evaluate this option in detail, but it is not included as part of Alternative 3.

Cumulative Analysis

Construction of Alternative 3 would result in the same types of impacts as the proposed project (for onshore construction) and Alternative 2 (for offshore construction), but would have a larger construction-related disturbance area (both onshore and offshore) compared to the proposed project and Alternative 2. The cumulative impacts from onshore construction would be the same as those described for the proposed project, but the contribution of Alternative 3 would be incrementally greater. Onshore construction-related activities could result in a cumulatively significant impact when combined with the water quality and hydrology effects of construction activities associated with the projects listed in **Table 4.1-2** in Section 4.1. However, as described for the proposed project, mandatory compliance with the NPDES Construction General Permit, General Waiver, and General WDRs as well as implementation of mitigation similar to the management plan described under **Mitigation Measure 4.7-2b**, would reduce the contribution of Alternative 3 to a level that is less than significant.

For offshore construction, no other reasonably foreseeable projects would result in offshore disturbance. Therefore, although Alternative 3 would have a significant and unavoidable impact related to offshore construction, a cumulative analysis is not applicable to impacts of offshore construction disturbance for Alternative 3.

Maintenance of the open-water intake would contribute to temporary and localized increased turbidity. However, no other reasonably foreseeable projects in the cumulative scenario for Alternative 3 would contribute to such turbidity impacts. Therefore, although Alternative 3 would have a significant and unavoidable impact related to turbidity during maintenance of the open-water intake, a cumulative analysis is not applicable to impacts of intake maintenance for Alternative 3.

The geographic area associated with the assessment of cumulative water quality impacts from Alternative 3 operational discharges is Monterey Bay, and the cumulative projects include the Sand City Coastal Desalination Plant (No. 6), RUWAP Desalination Element (No. 31), RUWAP Recycled Water Project (No. 35), and Pure Water Monterey's GWR Project (No. 59). The Sand City Coastal Desalination Plant was completed in 2010. The significance thresholds identified for the analysis of cumulative water quality impacts from cumulative projects are defined below. Alternative 3 would have a cumulatively significant impact if operational discharges, in combination with other past, current, or future point discharges, would:

- Exceed the receiving water limitation for salinity of 2 ppt at the edge of the BMZ established in the Ocean Plan, or;
- Exceed water quality objectives established in the Ocean Plan at the edge of the zone of initial dilution (ZID).

Implementation of Alternative 3, or ocean discharges related to other projects, would require coverage under a NPDES permit that would be required to meet the Ocean Plan water quality objectives and limitations for salinity. Further, operation of cumulative projects would be required to adhere to all monitoring and reporting requirements prescribed in the Ocean Plan (described in Section 4.3.2) for discharges and receiving water characteristics and for impacts on all forms of marine life.

As discussed in Section 4.3, Surface Water Hydrology and Water Quality, future water quality testing and analysis, required as part of the NPDES permit process, would determine whether operational discharges under Alternative 3 could comply with Ocean Plan water quality objectives.

The most recent amendment to the Ocean Plan (SWRCB, 2016b) reflects the SWRCB's process of adapting to the need to regulate discharges from desalination projects. Ocean Plan water quality objectives are incorporated into NPDES permits in the form of specific water quality requirements. As discussed above, under some circumstances, Alternative 3 discharges occasionally could exceed the 2 ppt salinity significance threshold by 0.15 ppt, and could exceed Ocean Plan water quality objectives for PCBs. Because proponents of the DeepWater Desalination Project have not proposed a monitoring and reporting plan that demonstrates methods of compliance with the Ocean Plan objectives that are protective of beneficial uses, and feasible mitigation strategies have not yet been identified, Alternative 3 in combination with other cumulative projects could result in significant cumulative impacts on ocean water quality and Alternative 3 would have a significant contribution to such effects. However, with the implementation of a monitoring plan consistent with Ocean Plan requirements that defines clear performance standards and feasible corrective actions linked to the defined performance standards substantially similar to **Mitigation Measures 4.3-4 and 4.3-5** (but revised specific to the Alternative 3 project final design and defined operating conditions), the contribution of Alternative 3 could be reduced to a level that is less than significant because it would comply with Ocean Plan requirements (*less than significant with mitigation*).

5.5.3.7 Direct and Indirect Effects of Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipelines, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water originating from the Salinas Valley Groundwater Basin, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**). Therefore, the surface water hydrology and water quality impact analysis of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4. Components that are common to both Alternative 4 and the proposed project are assessed in Section 4.3, Surface Water Hydrology and Water Quality.

Construction Impacts

Components unique to Alternative 4 would have a reduced land-based disturbance area compared to the proposed project. Land-based construction activities would result in 16 acres of disturbance at the proposed desalination plant site (compared to 25 acres for the proposed project) and the installation of 20 total miles of pipeline (compared to 21 miles of pipeline for the proposed project). Therefore, construction of Alternative 4 would have a *reduced* potential for soil erosion and risk of inadvertent releases of hazardous chemicals during general construction activities on land. For the same reason, Alternative 4 would also have a reduced potential for eroded soil and sediment to be transported down gradient via stormwater runoff and degrade the water quality of receiving water bodies, including Monterey Bay, compared to the proposed project. As with the proposed project, mandatory compliance with NPDES Construction General Permit and local grading requirements would involve implementation of a SWPPP, including stormwater BMPs as well as erosion and stormwater control measures, which would prevent substantial adverse effects on water quality during land-based construction.

However, offshore in MBNMS, Alternative 4 would result in approximately 43,200 square feet (approximately 1 acre) of disturbance on the seafloor from installation of the open ocean intake, outfall pipeline and diffuser, and laying of 1,100 feet of intake pipeline and 700 feet of brine discharge pipeline on the seafloor, ballasted with concrete collars and protected with riprap armoring. This would result in an increased level of impact on water quality from construction activities compared to the proposed project which proposes no construction on the seafloor. Due to the substantially increased size of the Alternative 4 in-water construction area and the lack of details available regarding construction techniques designed to avoid or minimize the degradation of water quality, Alternative 4 would result in an ***increased impact conclusion*** related to the degradation of water quality associated with increased soil erosion and inadvertent releases of hazardous chemicals during general construction activities compared to the proposed project, significant and unavoidable.

Construction-related discharges of dewatering effluent from open excavations would be reduced under Alternative 4 because of the reduced disturbance area associated with the desalination facility (16 acres versus 25 for the proposed project) and reduced total pipeline length (20 miles as compared to 21 for the proposed project). Most of the dewatering effluent produced during construction excavation is considered a low threat and would be discharged to land or the stormwater drainage system provided it complies with the *General WDRs for Discharges with a Low Threat to Water Quality*. Impacts from discharges of contaminated dewatering effluent from open excavations and well development that do not meet General Waiver requirements could be reduced to a less-than-significant level with implementation of mitigation similar to that prescribed for the proposed project, **Mitigation Measure 4.7-2b** (**Soil and Groundwater Management Plan**). Therefore, Alternative 4 would result in the ***same impact conclusion*** related to the degradation of water quality from construction-related discharges of dewatering effluent from open excavations compared to the proposed project, less than significant with mitigation.

Degradation of water quality from discharges of treated water and disinfectant during construction of Alternative 4 would be slightly reduced compared to the proposed project because of the reduced length of new pipeline (20 miles as compared to 21 miles for the proposed project). Like the proposed project however, adherence to the General Waste Discharge Requirements would ensure the degradation of water quality from discharges of treated water and disinfectant from existing and newly installed pipelines during construction and Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant.

During construction of Alternative 4, the potential for grading and earthmoving operations to alter local drainage patterns and redirect or concentrate stormflows would be reduced compared to the proposed project due to the smaller disturbance area associated with the desalination facility (16 acres versus 25 for the proposed project) and decreased pipeline length (20 miles as compared to 21 miles for the proposed project). However, although reduced, altered drainage patterns associated with Alternative 4 could result in increased risks related to onsite and/or downstream (offsite) erosion, siltation, and flooding, especially if stormwater conveyance capacity is exceeded. Mandatory compliance with NPDES Construction General Permit requirements and local regulations would involve implementation of erosion and stormwater control measures which would ensure the potential for impacts related to altered drainage patterns during construction would result in the ***same impact conclusion*** as the proposed project, less than significant.

Operational Impacts

Operational discharges associated with Alternative 4 would be released to Monterey Bay through a rehabilitated diffuser structure without blending with wastewater; there would be no heat gain in the brine. Discharge volumes would be increased (17.5 mgd) compared to the proposed project (14 mgd). Operational impacts on MBNMS water quality are assessed below for salinity and other Ocean Plan constituents.

Salinity Impacts

Alternative 4 would operate a 12 mgd desalination facility at a 45 percent recovery rate (based on 30 mgd of source water), producing a maximum of 17.5 mgd of brine (compared to 14 mgd for the proposed project) with a maximum salinity of 62.5 ppt (compared to 58.2 ppt for the proposed project). Brine would be discharged via an existing outfall, proposed to be rehabilitated and fitted with two, 16-inch diameter diffuser ports that the applicant states would be designed to meet Ocean Plan objectives for receiving water salinity limitations.

The Ocean Plan (SWRCB, 2016b) identifies multiport diffusers as the best method for disposing of brine when the brine cannot be diluted by wastewater and they are described as an end-of-pipe system that can be installed on submerged marine outfalls to discharge effluent through numerous ports or openings to enable rapid turbulent mixing that disperses and dilutes brine within a relatively small area. However, no studies or other information have been provided to support the conclusion that two 16-inch diameter diffuser ports proposed by the Alternative 4 proponent would meet the Ocean Plan objectives, and therefore, the areal extent of potentially increased salinity levels around the proposed diffuser is unknown. Discharges from Alternative 4 could locally increase salinity levels and could violate water quality standards, waste discharge requirements or otherwise degrade the water quality (including hypoxia) in Monterey Bay. Similar to the proposed project, a monitoring and reporting plan, consistent with the requirements of the Ocean Plan has not been defined and proposed. As such, Alternative 4 would not be consistent with the Plans, Policies, and Regulations described in Section 4.3, Surface Water Hydrology and Water Quality.

It is feasible that impacts relating to salinity could be reduced to less-than-significant levels and a monitoring and reporting plan, consistent with the requirements of the Ocean Plan could be proposed; with such measures, impacts could be less than significant. However, while the applicant may propose such measures and provide model analyses to demonstrate compliance with Ocean Plan objectives, compliance with the Ocean Plan objectives cannot be assumed at this time. Therefore, impacts related to operational discharges and impacts on water quality associated with Alternative 4 would have an increased salinity impact and would result in an ***increased impact conclusion*** compared to the proposed project; significant and unavoidable.

Other Ocean Plan Constituents

As described for Alternative 3, above, brine discharges from Alternative 4 would not be comingled with wastewater effluent, such as described for the proposed project. Therefore, Alternative 4 discharges are unlikely to exceed the numeric Ocean Plan objectives provided in **Table 4.3-4** for most of the listed water quality constituents since most of the listed constituent originate in wastewater. However, as described in Section 4.3, Surface Water Hydrology and Water Quality, the concentration of PCBs in Monterey Bay exceeds Ocean Plan water quality objectives under baseline conditions. Unlike the proposed project's use of subsurface slant wells, the open water intake would not pre-filter the PCBs through the seafloor. As such, the source water for the desalination process would be out of compliance with the Ocean Plan numeric WQO for PCBs, the desalination process would concentrate the PCB-levels and the brine discharge would exceed the Ocean Plan WQO. Also, as described in Section 4.3, brine-only discharges are dense and form a sinking or negatively buoyant plume. Such dense plumes are characterized by low dilution and mixing with receiving waters (as compared to brine that is comingled with municipal secondary treated waste water). Therefore, Alternative 4 operational discharges would be characterized by increased concentrations of PCBs in the brine as compared to the proposed project. This increase would result in an increased level of impact compared to the proposed project and unlike the proposed project, Alternative 4 could potentially exceed the Ocean Plan water quality objective for PCBs at the edge of the ZID.

It is feasible that impacts relating to exceedances of Ocean Plan objectives could be reduced to less-than-significant levels with mitigation similar to **Mitigation Measure 4.3-5** (**Implement Protocols to Avoid Exceeding Water Quality Objectives**). However, while the applicant may propose such measures or provide model analyses to demonstrate compliance with Ocean Plan objectives, the effectiveness of the diffuser design is currently unknown and feasible mitigation cannot be designed without additional information related to facility design, operational protocols, and diffuser dynamics. Therefore, Alternative 4 would result in an ***increased impact conclusion*** related to operational discharges and water quality for other Ocean Plan constituents compared to the proposed project, significant and unavoidable.

Maintenance Activities

The screened open water intake facility would involve regular maintenance cleaning from a boat using an automatic airburst connection and would not disturb the ocean floor. Periodic maintenance of the intake would increase turbidity temporarily in the immediate area surrounding the intake compared to the proposed project, but dilution, dispersion, and dynamic mixing by waves and tidal currents would result in turbidity levels rapidly reducing to ambient levels. Therefore, Alternative 4 would result in the ***same impact conclusion*** related to the degradation of water quality due to discharges associated with maintenance of wells and the open water intake compared to the proposed project, less than significant.

Facility Siting Impacts

Under Alternative 4, the desalination facilities would be constructed on 16.5 acres of the Moss Landing Green Commercial Business Park. Because the proposed development area is currently impervious, implementation of the desalination facilities would replace, and not increase, impervious surface area. As a result, there would be no anticipated changes in drainage patterns at the People's Project desalination plant site. When compared to the proposed action, Alternative 4 would reduce the total impervious surfaces by the roughly 15 acres of impervious surfaces that would be created under the proposed project. Impacts related to the alteration of drainage patterns, the amount of surface runoff, increases in flooding, erosion, siltation, or exceed storm drain capacity on or off-site would result in a reduced level of impact compared to the proposed project. As for the proposed project, Alternative 4 would be subject to the post-construction stormwater management requirements of the municipal stormwater permit and the applicant would be required to implement post-construction stormwater BMPs into the final site designs. With adherence to the post-construction requirements, Alternative 4 would result in the ***same impact conclusion*** related to drainage pattern alteration, storm runoff volume, stormwater conveyance capacity, increased soil erosion, and siltation compared to the proposed project, less than significant.

Impacts related to flooding due to the siting of Alternative 4 in a 100-year flood hazard area would result in an increased level of impact compared to the proposed project and all alternatives because a substantial portion of the 16.5-acre desalination plant site is located within a 100-year flood hazard zone. This area is designated as Zone A, indicating the base flood elevations have not been determined (FEMA, 2009). Based on the limited information available at this time regarding project design and flood hazard mitigation, the impact associated with the siting of project facilities in a 100-year flood hazard zone and the impedance or redirection of flood flows, Alternative 4 would result in an ***increased impact conclusion*** related to flooding and flood risks from tsunami and sea level rise compared to the proposed project due to the location of the desalination facility, significant and unavoidable.

The existing caisson, proposed to be rehabilitated for the seawater intake and brine disposal system, is located at the coastline, within the surf zone and within the anticipated extent of ongoing coastal erosion (**Appendix C2**). It can be reasonably expected that the existing caisson would continue to be exposed to ongoing coastal erosion, and would at some point be either removed or armored from the ongoing effects sea level rise. A new pump house on the existing caisson, as proposed by this alternative, would require the caisson to remain in place, potentially exposing adjacent properties to flooding from sea level rise. Mitigation would be required to address the flooding, including a coastal retreat strategy or a plan to armor the caisson, and in so doing, the applicant must demonstrate that flooding will not occur. However, while the applicant may propose such measures or provide model analyses to demonstrate compliance with Coastal Act requirements related to armoring, erosion, and sea level rise resilience, the final design is currently unknown and the feasibility of any proposed mitigation cannot determined at this time. Therefore, impacts related to coastal erosion from facility siting would have an increased level of impact as compared to the proposed project and Alternative 4 would result in an ***increased impact conclusion*** compared to the proposed project; significant and unavoidable.

In addition to physical impacts, Alternative 4 may be inconsistent with MBNMS Desalination Guidelines (NOAA, 2010), with regard to its lack of a combined discharge compared to the proposed project, which would use an existing operating outfall. One of the guidelines states: “project proponents should investigate the feasibility of diluting brine effluent by blending it with other existing discharges.” Alternative 4 would utilize an existing outfall, but the brine discharge would not be combined with other existing discharges.

Cumulative Analysis

The cumulative impacts from onshore construction would be the same as those described for the proposed project, but the contribution of Alternative 4 would be incrementally greater. Onshore construction-related activities could have a cumulatively considerable contribution to a significant cumulative impact when combined with the water quality and hydrology effects of construction activities associated with the projects listed in **Table 4.1-2** in Section 4.1. However, as described for the proposed project, mandatory compliance with the NPDES Construction General Permit, General Waiver, and General WDRs as well as implementation of mitigation similar to the management plan described under **Mitigation Measure 4.7-2b**, would reduce the contribution of Alternative 4 to a level that is not cumulatively significant (less than significant with mitigation).

The DeepWater Desal Project (No. 34 in **Table 4.1-2** in Section 4.1) also would include construction of a new open-water intake in Moss Landing and new outfall pipelines that would result in the type of localized water quality degradation described for Alternative 4. The proximity of these two projects’ in-water construction activities in Moss Landing could result in a significant cumulative impact on surface water quality. Like Alternative 4, the DeepWater Desal Project would be required to adhere to MBNMS regulations and requirements to ensure the protection of the beneficial uses of Sanctuary waters to prevent significant impacts on water quality in the Monterey Bay. However, until those provisions are defined and demonstrated to ensure compliance with the construction-related recommendations detailed in the MBNMS Desalination Guidelines, the cumulative impact would be significant and unavoidable, and the contribution of Alternative 4 to this impact would be cumulatively significant (*significant and unavoidable*).

The contribution to cumulative surface water quality impacts from operation of Alternative 4 would be increased compared to the proposed project. Maintenance of the open-water intake would contribute to temporary and localized increased turbidity. Similarly, maintenance of the DeepWater Desal Project open water intake could result in additional turbidity, potentially resulting in a significant cumulative impact. Like Alternative 4, the DeepWater Desal Project would be required to adhere to MBNMS regulations and requirements to ensure the protection of the beneficial uses of Sanctuary waters to prevent significant impacts on water quality in the Monterey Bay. However, until those provisions are defined and demonstrated to ensure compliance with the construction-related recommendations detailed in the MBNMS Desalination Guidelines, the cumulative impact would be significant and unavoidable, and the contribution of Alternative 4 to this impact would be significant and unavoidable.

The increased concentration of PCBs in the brine discharge from Alternative 4 may exceed the Ocean Plan water quality objective for PCBs at the edge of the ZID. The proposed outfall location for Alternative 4 is near the proposed outfall location for the DeepWater Desal project. Therefore, the discharge plumes from these two outfalls or their ZIDs could intersect or merge and result in exceedances of Ocean Plan defined water quality objectives, thereby adversely affecting beneficial uses of receiving waters (Monterey Bay). This would be a significant cumulative impact, and the contribution of Alternative 4 would be cumulatively significant. Because proponents of the People's Project have not demonstrated methods of compliance with the Ocean Plan objectives that are protective of beneficial uses, and feasible mitigation strategies have not yet been identified, Alternative 4 in combination with other cumulative projects would result in significant and unavoidable cumulative impacts on ocean water quality and Alternative 4 would have a cumulatively significant unavoidable contribution to such effects.

5.5.3.8 Direct and Indirect Effects of Alternative 5 - Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction Impacts

Components unique to Alternative 5a and 5b would have a smaller disturbance area at the CEMEX site (the converted test well and six new wells would disturb 1 less acre) and the Potrero Road Site (seven new wells would disturb 7 fewer acres) compared to the proposed project (the converted test well plus nine new wells). Therefore, the overall construction area for Alternatives 5a and 5b would be reduced compared to the proposed project. However, Alternatives 5a and 5b would still have a potential for soil erosion and risk of inadvertent releases of hazardous chemicals during general construction activities. Under Alternatives 5a and 5b, the potential for eroded soil and sediment to be transported down gradient via stormwater runoff and degrade the water quality of receiving water bodies, including the Salinas River and Monterey Bay, would remain. Mandatory compliance with NPDES Construction General Permit and local grading requirements would involve implementation of a SWPPP, including stormwater BMPs as well as erosion and stormwater control measures, which would prevent substantial adverse effects on water quality during construction. Alternatives 5a and 5b would result in the ***same impact conclusion*** related to the degradation of water quality associated with increased soil erosion and inadvertent releases of hazardous chemicals during general construction activities, less than significant.

Construction-related discharges of dewatering effluent from open excavations and water produced during well drilling of the slant wells would be decreased under Alternatives 5a and 5b because of the reduced number of proposed new wells at CEMEX and Potrero Road compared to the proposed project. Dewatering effluent produced during construction excavation would likely be considered a low threat and would be discharged to land or the stormwater drainage system provided it complies with the *General WDRs for Discharges with a Low Threat to Water Quality*.

The development water produced during well installation would be pumped to holding tanks to allow sediment to settle out and effluent would be discharged to the beach sands (Alternative 5a) or into a buried diffuser system in the parking lot for percolation into underlying beach sands (Alternative 5b) in accordance with the requirements of the General Waiver of WDRs (General Waiver). Impacts from discharges of contaminated dewatering effluent from open excavations and well development that do not meet General Waiver requirements would be reduced to a less-than-significant level with implementation of the same mitigation prescribed for the proposed project, **Mitigation Measure 4.7-2b** (**Soil and Groundwater Management Plan**). Alternative 5a and 5b would result in the ***same impact conclusion*** related to the degradation of water quality from construction-related discharges of dewatering effluent from open excavations and water produced during well drilling and development compared to the proposed project, less than significant with mitigation.

Degradation of water quality from discharges of treated water and disinfectant during construction of Alternative 5a and 5b would be the same as the proposed project and Alternative 1 because proposed pipelines would be the same. Adherence to the General Waste Discharge Requirements would ensure Alternatives 5a and 5a would result in the ***same impact conclusion*** as the proposed project and Alternative 1 and the degradation of water quality from discharges of treated water and disinfectant from existing and newly installed pipelines during construction would be less than significant.

During construction of Alternative 5a and 5b, the potential for grading and earthmoving operations to alter local drainage patterns and redirect or concentrate stormflows would be decreased slightly compared to the proposed project due to the reduced number of proposed wells. Although reduced, the potential for altered drainage patterns could result in increased risks related to onsite and/or downstream (offsite) erosion, siltation, and flooding, especially if stormwater conveyance capacity is exceeded, as compared to existing conditions. Mandatory compliance with NPDES Construction General Permit requirements and local regulations would involve implementation of erosion and stormwater control measures which would ensure the potential for impacts related to altered drainage patterns during construction would be less than significant, which would result in the ***same impact conclusion*** as the proposed project.

Operational Impacts

Impacts on water quality related to discharges of brine would result in a decreased level of impact compared to the proposed project because of the reduced volumes of brine produced from the smaller desalination plant. Under Alternatives 5a and 5b, a 6.4 mgd desalination plant would be constructed at Charles Benson Road (as compared to a 9.6 mgd facility for the proposed project). The reduced-capacity desalination plant would treat 15.5 mgd of source water at a 42 percent recovery rate and would generate approximately 9 mgd of brine (as compared to 14 mgd of brine for the proposed project) that would be discharged through the MRWPCA's existing ocean outfall. Similar to the proposed project, discharges from Alternative 5a and 5b would meet the Ocean Plan objective for salinity but would degrade the water quality in Monterey Bay in a very localized area, discussed below. Because no heating mechanism or process would increase the temperature of the source water as it passes through the treatment units, thermal impacts on receiving waters are not discussed further.

Salinity Impacts

This analysis of impacts related to increased salinity from operational discharges incorporates the significance thresholds, approach to analysis, and methodologies described in detail under Impact 4.3-4 in Section 4.3, Surface Water Hydrology and Water Quality.

Plant Operation and Discharge Scenarios

The reduced-capacity desalination plant proposed under both Alternatives 5a and 5b would treat 15.5 mgd of source water at a 42 percent recovery rate and would generate approximately 9 mgd of brine (as compared to 14 mgd of brine for the proposed project) that would be discharged through the MRWPCA's existing ocean outfall. During the non-irrigation season (November through March), brine would be combined and discharged with varying amounts of secondary treated wastewater. During the irrigation season, only brine would be discharged.

As discussed in detail under Impact 4.3-4, the treated wastewater flow from the MRWPCA Regional Wastewater Treatment Plant varies throughout the year (**Table 4.3-9**). The highest wastewater flows occur during the non-irrigation season (November through March) and the lowest flows during the irrigation season (April through October) when the secondary treated wastewater is processed through the SVRP for tertiary treatment and distributed to irrigators through the CSIP. During the irrigation season, on some days, all of the wastewater flows could be provided to irrigators, and only the brine would be discharged into Monterey Bay through the outfall. The following discharge scenarios are assessed for salinity related water quality impacts (**Table 5.5-2**):

- **Scenario V1, Brine-only**: 8.99 mgd of brine would be discharged alone through the MRWPCA outfall. This operating scenario would occur during the irrigation season.
- **Scenarios V2 toV11, Brine-with-Wastewater**: 8.99 mgd of brine would be discharged with varying volumes of treated wastewater from the MRWPCA Regional Wastewater Treatment Plant. These operating scenarios would occur when treated wastewater is available during the non-irrigation season during typical desalination plant operations.
- **Scenario V12, High Brine Only**: as described in Section 3.4.1, following a shutdown of the desalination facility for repair or routine maintenance, CalAm may temporarily (up to 11 days) operate the desalination facility with one additional reverse osmosis module in service to catch up on production; however, the total annual production would not be increased. As with Scenario V1, brine would be discharged without wastewater into Monterey Bay/MBNMS through the outfall during the irrigation season as a result of the MRWPCA wastewater flows being provided to irrigators.
- **Scenarios V13 toV26, High Brine-with-Wastewater**: as with Scenarios V2 through V11, the analysis accounted for different wastewater flows being combined with the higher volume brine discharges.

Approach to Analysis

The approach to analysis for assessing discharges is consistent with the approach described under Impact 4.3-4 for the proposed project (Section 4.3, Surface Hydrology and Water Quality). A detailed description of the model methodology and conservative assumptions applied for calculating discharge dilution and salinity at the outfall diffuser is provided under Impact 4.3-4, with further details provided in **Appendix D1** and **D2**.

To model the discharge scenarios, Roberts (2016, 2017) combined the ambient conditions for Monterey Bay, the operational scenarios from **Table 5.5-2**, and the effluent water quality characteristics of the brine and the MRWPCA wastewater (**Table 4.3-11**) to calculate flow, salinity, and density for all assessed discharge scenarios (**Table 5.5-3**). The calculated values were then used to compute minimum dilution ratios (Dm) at the edge of the ZID, estimate the gradient of salinity between the diffuser ports and the edge of the ZID, and calculate the salinity beyond the ZID but within the BMZ (see **Appendix D1** for details).

TABLE 5.5-2
ALTERNATIVE 5 DISCHARGE SCENARIOS MODELED

Scenario No.	Discharge Scenario	Constituent Flows (mgd)	
		Secondary Effluent	Desal Brine
Typical Discharge Scenarios			
V1	Brine only	0	8.99
V2	Brine + Low (1) SE	1	8.99
V3	Brine + Low (2) SE	2	8.99
V4	Brine + Low (3) SE	3	8.99
V5	Brine + Low (4) SE	4	8.99
V6	Brine + Moderate (5) SE	5	8.99
V7	Brine + Moderate (5.8) SE	5.80	8.99
V8	Brine + Moderate (7) SE	7	8.99
V9	Brine + High (10) SE	10	8.99
V10	Brine + High (14) SE	14	8.99
V11	Brine + High (19.78) SE	19.78	8.99
High Brine Discharge Scenarios (post-shutdown operations)			
V12	High Brine only	0	11.24
V13	High Brine + Low (0.5) SE	0.5	11.24
V14	High Brine + Low (1) SE	1	11.24
V15	High Brine + Low (2) SE	2	11.24
V16	High Brine + Low (3) SE	3	11.24
V17	High Brine + Low (4) SE	4	11.24
V18	High Brine + Moderate (5) SE	5	11.24
V19	High Brine + Moderate (6) SE	6	11.24
V20	High Brine + Moderate (7) SE	7	11.24
V21	High Brine + Moderate (8) SE	8	11.24
V22	High Brine + Moderate (9) SE	9	11.24
V23	Brine + High (10) SE	10	11.24
V24	Brine + High (12) SE	12	11.24
V25	Brine + High (14) SE	14	11.24
V26	Brine + High (16) SE	16	11.24

NOTES: SE = MRWPCA secondary effluent wastewater

SOURCE: Roberts, 2017.

Salinity Impact Results and Discussion

The potential for a salinity-related water quality impact to occur was analyzed from the diffuser port to the edge of the BMZ (328 feet). Discharge scenarios comprised of only brine (Scenarios V1 and V12) and brine with low to moderate volumes of wastewater (Scenarios V2 to V8 for typical operations and V13 to V21 for post shut-down operations) were determined to be dense (i.e., with salinity levels in excess of ambient conditions) and, thus, negatively buoyant. When the brine is mixed with high volumes of wastewater (Scenarios V9 to V11 for typical operations and V22 to V26 for post shut-down operations), the plume would be positively buoyant because the salinity and density of the effluent is substantially lower than that of receiving waters (**Table 5.5-3**).

TABLE 5.5-3
ALTERNATIVE 5 OPERATIONAL DISCHARGE FLOW, SALINITY AND DENSITY

Scenario No.	Discharge Scenario	Combined effluent		
		Flow (mgd)	**Salinity (ppt)[1]**	**Density (kg/m3)**
Typical Discharge Scenarios				
V1	Brine only	8.99	58.23	1045.2
V2	Brine + Low (1) SE	9.99	52.48	1040.6
V3	Brine + Low (2) SE	10.99	47.78	1036.8
V4	Brine + Low (3) SE	11.99	43.86	1033.6
V5	Brine + Low (4) SE	12.99	40.55	1030.9
V6	Brine + Moderate (5) SE	13.99	37.70	1028.6
V7	Brine + Moderate (5.8) SE	14.79	35.71	1027.0
V8	Brine + Moderate (7) SE	15.99	33.09	1024.9
V9	Brine + High (10) SE	18.99	27.99	1020.8
V10	Brine + High (14) SE	22.99	23.26	1017.0
V11	Brine + High (19.78) SE	28.77	18.75	1013.3
High Brine Discharge Scenarios (post-shutdown operations)				
V12	High Brine only	11.24	58.23	1045.2
V13	High Brine + Low (0.5) SE	11.74	55.78	1043.3
V14	High Brine + Low (1) SE	12.24	53.54	1041.4
V15	High Brine + Low (2) SE	13.24	49.55	1038.2
V16	High Brine + Low (3) SE	14.24	46.13	1035.5
V17	High Brine + Low (4) SE	15.24	43.16	1033.0
V18	High Brine + Moderate (5) SE	16.24	40.55	1030.9
V19	High Brine + Moderate (6) SE	17.24	38.24	1029.1
V20	High Brine + Moderate (7) SE	18.24	36.19	1027.4
V21	High Brine + Moderate (8) SE	19.24	34.35	1025.9
V22	High Brine + Moderate (9) SE	20.24	32.69	1024.6
V23	Brine + High (10) SE	21.24	31.19	1023.4
V24	Brine + High (12) SE	23.24	28.58	1021.3
V25	Brine + High (14) SE	25.24	26.38	1019.5
V26	Brine + High (16) SE	27.24	24.50	1018.0

NOTES: SE = MRWPCA secondary effluent wastewater

SOURCE: Roberts, 2017.

The results of modeled salinity predictions and minimum dilution values for each discharge scenario, and the distance from the diffuser port at which the dense discharge plume makes contact with the seabed, is shown in **Table 5.5-4** for all dense discharge scenarios. The worst case condition for dilution, as expected, would be when only brine is discharged during the irrigation season (Scenarios V1 and V12). The salinity increment in Scenario V1 at the edge of the ZID (approximately 9 feet from the diffuser port) and at the BMZ was modeled to be 1.59 ppt and 1.32 ppt above ambient, respectively. Scenario V12 would be relatively similar due to the Tideflex diffusers, as discussed under Impact 4.3-4 in Section 4.3. All other discharge scenarios evaluated are shown to have lower incremental salinities (and higher Dm) than Scenario V1. In all scenarios modeled, the Ocean Plan salinity limit of 2 ppt would be met within the ZID, the length of which ranges from approximately 9 to 30 feet from the outfall diffuser for the dense scenarios.

Positively buoyant discharge plumes (i.e., those with densities less than the receiving water) require different analytical procedures than are used for negatively buoyant plumes. The plume dynamics for buoyant plume operational scenarios were assessed using the same procedure as that described under Impact 4.3-4 (see Section 4.3, Surface Water Hydrology and Water Quality).

The modeling results for the buoyant plumes are presented in **Table 5.5-5** and indicate that the dilution would be higher for the buoyant scenarios evaluated than for any of the dense plumes and that buoyant operational discharges would not exceed the significance threshold of 2 ppt at the BMZ.

Salinity Impact Summary and Conclusion

The analysis of salinity levels indicates that all discharge scenarios would result in salinity increases of less than 2 ppt above ambient levels at the edge of the ZID (up to 30 feet from the diffuser for Alternative 5a or 5b, as compared to 39 feet for the proposed project, when considering worst-case post shut-down operations) and at the edge of the BMZ (328 feet from the diffuser). Therefore, Alternative 5 (either 5a or 5b) would not exceed or violate the salinity standards. The salinity increases presented here represent conservative values and would occur only along the seabed. For the majority of the water column, incremental salinities would be much lower than reported values. Therefore, Alternative 5 discharges would not violate water quality standards, waste discharge requirements, or otherwise degrade the water quality (including hypoxia) of receiving waters in Monterey Bay by increasing salinity levels, and would result in a slightly reduced level of impact compared to the proposed project due to the reduced volume of brine discharged (9 mgd as compared to 14 for the proposed project) and the reduced extent of the ZID associated with operational discharges (21 feet from the diffuser as compared to 39 feet for the proposed project for typical operations). However, as described in Section 4.3.2.2, the Ocean Plan includes monitoring and reporting requirements for operation of new desalination facilities (Section III.M.4, “Monitoring and Reporting Program”; SWRCB, 2016b). The Monitoring and Reporting Plan must include provisions for monitoring of effluent and receiving water characteristics and impacts on all forms of marine life. The implementation of **Mitigation Measure 4.3-4 (Operational Discharge Monitoring, Analysis, Reporting, and Compliance)** would ensure compliance with Ocean Plan objectives and requirements. Therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** for salinity increases as the proposed project, less than significant with mitigation.

TABLE 5.5-4
DILUTION MODEL RESULTS FOR ALTERNATIVE 5 DENSE DISCHARGE SCENARIOS

Scenario No.	Scenario	Predictions: SEA Dilution	Predictions: VP Dilution	Predictions: VP Distance (ft)	At impact (ZID): Dilution[a]	At impact (ZID): Salinity increment (ppt)	At BMZ: Dilution	At BMZ: Salinity increment (ppt)
Typical Discharge Scenarios								
V1	Brine only	15.7	16.0	8.6	15.7	1.59	18.8	1.32
V2	Brine + Low (1) SE	16.3	16.9	9.6	16.3	1.17	19.6	0.98
V3	Brine + Low (2) SE	17.4	18.1	10.5	17.4	0.83	20.8	0.69
V4	Brine + Low (3) SE	18.8	19.8	12.4	18.8	0.56	22.6	0.47
V5	Brine + Low (4) SE	20.9	21.6	14.4	20.9	0.35	25.0	0.29
V6	Brine + Moderate (5) SE	24.6	24.9	17.5	24.6	0.18	29.5	0.15
V7	Brine + Moderate (5.8) SE	30.3	29.4	21.4	29.4	0.08	35.3	0.07
V8	Brine + Moderate (7) SE	110.2	67.6	51.4	67.6	0.00	81.1	0.00
V9	Brine + High (10) SE[1]	-	-	-	-	-	-	-
V10	Brine + High (14) SE[1]	-	-	-	-	-	-	-
V11	Brine + High (19.78) SE[1]	-	-	-	-	-	-	-
High Brine Discharge Scenarios (post-shutdown operations)								
V12	High Brine only	15.4	16.1	9.3	15.4	1.61	18.5	1.34
V13	High Brine + Low (0.5) SE	15.8	16.5	9.2	15.8	1.42	19.0	1.18
V14	High Brine + Low (1) SE	16.1	16.8	10.3	16.1	1.26	19.3	1.05
V15	High Brine + Low (2) SE	16.9	17.8	11.0	16.9	0.96	20.3	0.80
V16	High Brine + Low (3) SE	18.1	19.0	12.4	18.1	0.71	21.7	0.59
V17	High Brine + Low (4) SE	19.6	20.3	13.9	19.6	0.50	23.5	0.42
V18	High Brine + Moderate (5) SE	21.5	22.0	15.8	21.5	0.33	25.9	0.28
V19	High Brine + Moderate (6) SE	24.7	24.6	18.2	24.6	0.20	29.5	0.17
V20	High Brine + Moderate (7) SE	30.0	28.8	22.0	28.8	0.10	34.6	0.08
V21	High Brine + Moderate (8) SE	42.4	37.4	29.7	37.4	0.03	44.9	0.02
V22	High Brine + Moderate (9) SE[1]	-	-	-	-	-	-	-
V23	Brine + High (10) SE[1]	-	-	-	-	-	-	-
V24	Brine + High (12) SE[1]	-	-	-	-	-	-	-
V25	Brine + High (14) SE[1]	-	-	-	-	-	-	-
V26	Brine + High (16) SE[1]	-	-	-	-	-	-	-

NOTES: SE = MRWPCA secondary effluent wastewater

[1] See Table 5.5-5 for results of buoyant discharges.

SOURCE: Roberts, 2017

TABLE 5.5-5
DILUTION RESULTS FOR BUOYANT ALTERNATIVE 5 DISCHARGE SCENARIOS

Scenario No.	Scenario	Season	Effluent conditions			UM3 simulations		NRFIELD simulations		
			Flow (mgd)	Salinity (ppt)	Density (kg/m^3)	Average dilution	Rise height (centerline) (ft)	Minimum dilution	Rise height (centerline) (ft)	Rise height (top) (ft)
V9	Brine + High (10) SE	Upwelling	18.99	27.99	1020.8	101	28	-	-	-
		Davidson				145	55	-	-	-
		Oceanic				-	-	-	-	-
V10	Brine + High (14) SE	Upwelling	22.99	23.26	1017.0	110	37	-	-	-
		Davidson				172	75	-	-	-
		Oceanic				116	42	-	-	-
V11	Brine + High (19.78) SE	Upwelling	28.77	18.75	1013.3	-	-	100	39	41
		Davidson				-	-	215	97	100
		Oceanic				-	-	134	57	59
V22	High Brine + Mod (9) SE	Upwelling	20.24	32.69	1024.6	91	17	-	-	-
		Davidson				100	15	-	-	-
		Oceanic				138	41	-	-	-
V23	Brine + High (10) SE	Upwelling	21.24	31.19	1023.4	88	20	-	-	-
		Davidson				124	47	-	-	-
		Oceanic				88	18	-	-	-
V24	Brine + High (12) SE	Upwelling	23.24	28.58	1021.3	96	28	-	-	-
		Davidson				133	55	-	-	-
		Oceanic				95	26	-	-	-
V25	Brine + High (14) SE	Upwelling	25.24	26.38	1019.5	100	32	-	-	-
		Davidson				144	64	-	-	-
		Oceanic				104	35	-	-	-
V26	Brine + High (16) SE	Upwelling	27.24	24.50	1018.0	103	36	-	-	-
		Davidson				155	73	-	-	-
		Oceanic				109	41	-	-	-

NOTES: SE = MRWPCA secondary effluent wastewater

SOURCE: Roberts, 2017

Other Ocean Plan Constituents

Consistent with the approach to analysis described under Impact 4.3-5 (see Section 4.3, Surface Water Hydrology and Water Quality), this impact analysis uses the Ocean Plan water quality objectives, applied at the edge of the ZID, as significance thresholds for determining whether or not the discharges would result in a significant impact related to water quality, water quality standards, and waste discharge requirements.

Approach to Analysis

The same approach to analysis was applied to Alternative 5 that was described for the proposed project under Impact 4.3-5 (Section 4.3, Surface Hydrology and Water Quality). Potential water quality impacts were identified by determining whether discharges would exceed the conservative threshold of 80 percent of the Ocean Plan objective. **Appendix D3** documents the data sources and provides further detail on the methodology used to perform the ocean water quality modeling analysis. **Table 4.3-4** provides the suite of constituents and their numeric Ocean Plan water quality objectives.

Results and Impact Discussion

The estimated concentrations for the full suite of Ocean Plan constituents are presented as concentrations at the edge of the ZID and as a percentage of the Ocean Plan numeric water quality objective in **Appendix D3** (**Tables 8** and **10**; **Tables A3** and **A4**). Consistent with the results discussed under Impact 4.3-5 for the proposed project, the model analysis determined that Alternative 5 discharges would not exceed Ocean Plan water quality objectives for the majority of constituents listed in **Table 4.3-4**. Additionally, no exceedances or potential exceedances were determined to occur for discharge scenarios involving brine-only or high volumes of MRWPCA wastewater (see **Appendix D3**, **Table 4**).

However, consistent with impacts assessed for the proposed project (see Impact 4.3-5), when brine is combined with low to moderate volumes of MRWPCA wastewater, ammonia and cyanide are predicted to exceed 80 percent of the Ocean Plan WQOs at the edge of the ZID. Also, specific to Alternative 5, chlordane is predicted to exceed 80 percent of the Ocean Plan WQOs at the edge of the ZID for a single operational scenario when brine is combined with low (4 mgd) volumes of MRWPCA wastewater. For an additional eleven constituents, there is not enough information to assess concentrations at the edge of the ZID due to differences in MRLs used to assess the source waters or due to MRLs being higher than Ocean Plan objectives. Only future water quality testing and analysis, such as that required under the NPDES permit process, would determine whether discharges under Alternative 5 would fully comply with Ocean Plan water quality objectives. Therefore, it must be concluded that Alternative 5 could result in a significant impact that could be reduced to less than significant with the implementation of **Mitigation Measure 4.3-5**. (**Implement Protocols to Avoid Exceeding Water Quality Objectives**), which would require CalAm to perform an extensive water quality assessment prior to implementation; in addition, operational discharges that cannot be demonstrated to conform to the prescribed performance standards may only be released following implementation of additional design features, engineering solutions, and/or operational measures to ensure compliance with provisions of the Ocean Plan.

Impact Summary and Conclusion – Ocean Plan Water Quality Constituents

The model-based analyses concluded that constituent concentrations would become elevated to levels greater than 80 percent of the Ocean Plan objective (established as a conservative significance threshold for determining impacts) under some of the assessed discharge scenarios involving low and moderate volumes of MRWPCA wastewater. For an additional eleven constituents, there is not enough information to assess concentrations at the edge of the ZID due to differences in MRLs used to assess the source waters or due to MRLs being higher than Ocean Plan objectives. Therefore, it was concluded that Alternative 5 could result in a significant impact related to water quality standards, waste discharge requirements and water quality of receiving waters in Monterey Bay. Significant impacts would be reduced to a less-than-significant levels by implementing **Mitigation Measure 4.3-5** (**Implement Protocols to Avoid Exceeding Water Quality Objectives**).

Also, **Mitigation Measure 4.3-4** (**Operational Discharge Monitoring, Analysis, Reporting, and Compliance**), described under Impact 4.3-4 (Section 4.3, Surface Water Hydrology and Water Quality), would further reduce and minimize potential impacts by requiring CalAm to implement a comprehensive Monitoring and Reporting Plan (Plan), following approval by the RWQCB and MBNMS, to obtain field monitoring and marine biological resource data in the area affected by a project. The Plan would set forth appropriate response thresholds and trigger corrective actions (defined in **Mitigation Measure 4.3-5**) that would be required if the acquired data indicated deleterious effects to receiving water quality or marine resources from discharges. Therefore, although Alternatives 5a and 5b would produce less brine because of the reduced capacity desalination plant, they would each result in the ***same impact conclusion*** for meeting Ocean Plan water quality objectives for other constituents compared to the proposed project, less than significant with mitigation.

Facility Siting Impacts

Under Alternative 5a and 5b, the disturbance area for maintenance of the slant wells at the CEMEX site and the Potrero Road site would be slightly reduced as compared to proposed project due to the reduced number of wells at each location (7 wells under Alternatives 5a and 5b as compared to ten wells for the proposed project). Impervious surfaces would remain substantially similar to the proposed project in the context of storm runoff volume generation. Therefore, Alternative 5a and 5b impacts related to the alteration of drainage patterns such that there is a resultant increase in erosion, siltation, flooding on- or offsite or the exceeding of storm drain capacity would be similar as compared to the proposed project. With adherence to post-construction stormwater management requirements and post-construction stormwater BMPs, Alternatives 5a and 5b would result in the ***same impact conclusion*** compared to the proposed project, less than significant.

Under Alternative 5a and 5b, impacts related to flooding and flood risks, including those from tsunami and sea level rise would remain the same as those described for the proposed project due to all project facilities being located at the same sites despite the reduced number of wells and the reduced desalination facility under Alternatives 5a and 5b as compared to the proposed project. Impacts associated with flooding and flood risks under Alternative 5a and 5b would result in the ***same impact conclusion*** compared to the proposed project, less than significant.

Cumulative Analysis

Combined Impacts with GWR Project

The GWR Project would produce between 0.94 mgd and 1.17 mgd of RO treated effluent that would be discharged into Monterey Bay through the MRWPCA's existing ocean outfall. GWR Project discharges could combine with discharges of Alternative 5 and potentially violate water quality standards or degrade water quality in the area immediately surrounding the outfall diffuser.

Salinity Impacts

The discharges of the 6.4 mgd desalination plant, combined with effluent from the GWR Project and varying volumes of treated wastewater from the existing MRWPCA Regional Wastewater Treatment Plant, would be discharged into Monterey Bay through the MRWPCA's existing ocean outfall and would locally increase salinity levels that could violate water quality standards, waste discharge requirements, or otherwise degrade the water quality in Monterey Bay, thus resulting in a significant water quality impact from these combined discharges. The analysis of impacts related to discharges that include GWR effluent presented here incorporates the significance thresholds, approach to analysis, and methodologies described in detail under Impact 4.3-4 in Section 4.3, Surface Water Hydrology and Water Quality, as well as above under the discussion of the operational impacts of Alternative 5.

Combined Desalination Plant and GWR Operation and Discharge Scenarios

Operation of Alternative 5 and the GWR project would result in discharges that would include brine from the Alternative 5 6.4 mgd desalination plant, effluent from the GWR Project, and treated wastewater from the existing MRWPCA Regional Wastewater Treatment Plant. During certain times of the year, a blend of brine and GWR effluent would be discharged. Additionally, the blend of brine and GWR effluent would be further combined with varying amounts of treated wastewater from the MRWPCA Regional Wastewater Treatment Plant, depending on the time of year (see **Table 4.3-8**). A wide range of operational discharge scenarios was assessed for salinity-related water quality impacts (**Table 5.5-6**) as follows:

- **Brine-with-GWR**: 8.99 mgd of brine generated from the Alternative 5 Desalination Plant would be discharged with either 0.94 mgd or 1.17 mgd of GWR effluent under either typical or post shut-down operations. These operating scenarios (C1, C12, C17 from **Table 5.5-6**) would typically occur during the irrigation season when wastewater is not available.
- **Combined Discharge**: The brine and GWR discharge (8.99 mgd of brine and either 0.94 mgd or 1.17 mgd of GWR effluent) would be combined with varying volumes of treated wastewater from the MRWPCA Regional Wastewater Treatment Plant under typical and post shut-down operations. These operating scenarios (**Table 5.5-6**) would typically occur in the non-irrigation season when wastewater is available.

Additionally, potential discharge scenarios would include combinations of treated wastewater with GWR effluent or GWR effluent alone (i.e., without desalination brine). Such discharge scenarios could occur if the GWR Project comes on line before the Alternative 5 Desalination Plant, or if the Alternative 5 desalination plant periodically shuts down. These scenarios would not represent a contribution to combined impacts for Alternative 5, but have been modeled and

TABLE 5.5-6
MPWSP CUMULATIVE DISCHARGE SCENARIOS MODELED

Scenario No.	Discharge Scenario	Constituent Flows (mgd)		
		Secondary Effluent	Desal Brine	GWR
Typical Discharge Scenarios				
C1	Brine + High GWR only	0	8.99	1.17
C2	Brine + High GWR + Low (1) SE	1	8.99	1.17
C3	Brine + High GWR + Low (2) SE	2	8.99	1.17
C4	Brine + High GWR + Low (3) SE	3	8.99	1.17
C5	Brine + High GWR + Low (4) SE	4	8.99	1.17
C6	Brine + High GWR + Mod (5) SE	5	8.99	1.17
C7	Brine + High GWR + Mod (5.3) SE	5.3	8.99	1.17
C8	Brine + High GWR + Mod (6) SE	6	8.99	1.17
C9	Brine + High GWR + Mod (7) SE	7	8.99	1.17
C10	Brine + High GWR + High (11) SE	11	8.99	1.17
C11	Brine + High GWR + High (15.92) SE	15.92	8.99	1.17
C12	Brine + Low GWR only	0	8.99	0.94
C13	Brine + Low GWR + Low (1) SE	1	8.99	0.94
C14	Brine + Low GWR + Low (3) SE	3	8.99	0.94
C15	Brine + Low GWR + Mod (5.3) SE	5.3	8.99	0.94
C16	Brine + Low GWR + High (15.92) SE	15.92	8.99	0.94
High Brine Discharge Scenarios (post-shutdown operations)				
C17	High Brine + High GWR only	0	11.24	1.17
C18	High Brine + High GWR + Low (0.5) SE	0.5	11.24	1.17
C19	High Brine + High GWR + Low (1) SE	1	11.24	1.17
C20	High Brine + High GWR + Low (2) SE	2	11.24	1.17
C21	High Brine + High GWR + Low (3) SE	3	11.24	1.17
C22	High Brine + High GWR + Low (4) SE	4	11.24	1.17
C23	High Brine + High GWR + Mod (5) SE	5	11.24	1.17
C24	High Brine + High GWR + Mod (6) SE	6	11.24	1.17
C25	High Brine + High GWR + Mod (7) SE	7	11.24	1.17
C26	High Brine + High GWR + Mod (8) SE	8	11.24	1.17
C27	High Brine + High GWR + Mod (9) SE	9	11.24	1.17
C28	High Brine + High GWR + High (10) SE	10	11.24	1.17
C29	High Brine + High GWR + High (12) SE	12	11.24	1.17
C30	High Brine + High GWR + High (14) SE	14	11.24	1.17
C31	High Brine + High GWR + High (16) SE	16	11.24	1.17

NOTES: SE = MRWPCA secondary effluent wastewater

SOURCE: Roberts, 2017

impacts comprehensively assessed and documented under Impact HS-5 in Section 4.11.4.4 of the GWR Project Final EIR (MRWPCA and MPWMD, 2016; p. 4.11-78 *et seq*.). Additionally, such scenarios have been further investigated for dilution and mixing at the outfall in EIR/EIS **Appendices D1** and **D3**. Because the salinity of discharges that do not include Alternative 5 Desalination Plant brine would be substantially lower than that of ambient conditions and therefore would not exceed the significance threshold of 2 ppt at the BMZ, impacts would be less than significant and these scenarios are not discussed further.

Approach to Analysis

The approach to analyzing the combined discharges of Alternative 5 and the GWR Project is consistent with the approach described under Impact 4.3-4 for the proposed project (Section 4.3, Surface Hydrology and Water Quality). A detailed description of the model methodology and conservative assumptions applied for calculating operational discharge dilution and salinity at the outfall diffuser is provided under Impact 4.3-4, with further details provided in **Appendices D1** and **D2**.

To revise the brine discharge model analysis for the Alternative 5 with GWR Project operational discharge scenarios, Roberts (2016, 2017) combined the site-specific conditions for Monterey Bay receiving waters, the combined discharge scenarios in **Table 5.5-6** and the effluent water quality characteristics of the brine, GWR effluent, and the MRWPCA wastewater to calculate flow, salinity, and density for all assessed combined discharge scenarios (**Table 5.5-7**). The calculated values (**Table 5.5-7**) were then utilized to compute minimum dilution ratios (Dm) at the edge of the ZID, estimate the gradient of salinity between the diffuser ports and the edge of the ZID, and calculate the salinity beyond the ZID but within the regulatory brine mixing zone (BMZ) (see **Appendix D1** for details). These results are presented and discussed below.

Results and Impact Discussion

Alternative 5 was analyzed for potential water quality impacts as a result of combined discharges from the diffuser port to the edge of the BMZ. Of the Alternative 5 combined discharge scenarios assessed (**Table 5.5-6**), discharges comprising brine and GWR effluent only (Scenario C1 and C12), and combined flows comprising brine and GWR effluent as well as low to moderate volumes of wastewater (Scenarios C2 through C8 and C12 through C15 for typical operations; Scenarios C17 through C25 for post shut-down operations) were determined to be dense (i.e., with salinity levels in excess of ambient conditions) and, thus, negatively buoyant. When the Alternative 5 brine is combined with GWR effluent and a high volume of wastewater (Scenarios C9 through C11 and C16 for typical operations; Scenarios C26 through C31 for post shut-down operations), the plume is positively buoyant because the salinity and density of the effluent is substantially lower than that of receiving waters (**Table 5.5-7**).

Model simulations were run for all of the combined discharge scenarios (discussed in detail in Appendices D1 and D2). The results of the salinity predictions and minimum dilution values, the distance between the diffuser port and the point where the plume contacts the seabed, and the incremental salinity increases above background conditions for each dense cumulative discharge scenario at the edge of the ZID and the BMZ are presented in **Table 5.5-8**.

TABLE 5.5-7
ALTERNATIVE 5 COMBINED OPERATIONAL DISCHARGE FLOW, SALINITY, AND DENSITY

Scenario No.	Discharge Scenario	Combined effluent		
		Flow (mgd)	Salinity (ppt)[1]	Density (kg/m3)
Typical Discharge Scenarios				
C1	Brine + High GWR only	10.16	52.19	1040.3
C2	Brine + High GWR + Low (1) SE	11.16	47.59	1036.6
C3	Brine + High GWR + Low (2) SE	12.16	43.74	1033.5
C4	Brine + High GWR + Low (3) SE	13.16	40.48	1030.9
C5	Brine + High GWR + Low (4) SE	14.16	37.67	1028.6
C6	Brine + High GWR + Mod (5) SE	15.16	35.24	1026.6
C7	Brine + High GWR + Mod (5.3) SE	15.46	34.57	1026.1
C8	Brine + High GWR + Mod (6) SE	16.16	33.11	1024.9
C9	Brine + High GWR + Mod 7) SE	17.16	31.23	1023.4
C10	Brine + High GWR + High (11) SE	21.16	25.48	1018.7
C11	Brine + High GWR + High (15.92) SE	26.08	20.82	1015.0
C12	Brine + Low GWR only	9.93	53.27	1041.2
C13	Brine + Low GWR + Low (1) SE	10.93	48.47	1037.3
C14	Brine + Low GWR + Low (3) SE	12.93	41.09	1031.4
C15	Brine + Low GWR + Mod (5.3) SE	15.23	35.01	1026.4
C16	Brine + Low GWR + High (15.92) SE	25.85	20.95	1015.1
High Brine Discharge Scenarios (post-shutdown operations)				
C17	High Brine + High GWR only	12.41	53.29	1041.2
C18	High Brine + High GWR + Low (0.5) SE	12.91	51.25	1039.6
C19	High Brine + High GWR + Low (1) SE	13.41	49.37	1038.0
C20	High Brine + High GWR + Low (2) SE	14.41	46.00	1035.3
C21	High Brine + High GWR + Low (3) SE	15.41	43.07	1033.0
C22	High Brine + High GWR + Low (4) SE	16.41	40.49	1030.9
C23	High Brine + High GWR + Mod (5) SE	17.41	38.21	1029.0
C24	High Brine + High GWR + Mod (6) SE	18.41	36.18	1027.4
C25	High Brine + High GWR + Mod (7) SE	19.41	34.36	1025.9
C26	High Brine + High GWR + Mod (8) SE	20.41	32.71	1024.6
C27	High Brine + High GWR + Mod (9) SE	21.41	31.22	1023.4
C28	High Brine + High GWR + High (10) SE	22.41	29.87	1022.3
C29	High Brine + High GWR + High (12) SE	24.41	27.48	1020.4
C30	High Brine + High GWR + High (14) SE	26.41	25.46	1018.7
C31	High Brine + High GWR + High (16) SE	28.41	23.73	1017.3

SOURCE: Roberts, 2017.

TABLE 5.5-8
DILUTION MODEL RESULTS FOR ALTERNATIVE 5 COMBINED DENSE DISCHARGE SCENARIOS

Scenario No.	Scenario	Predictions			At impact (ZID)		At BMZ	
		SEA	VP					
		Dilution	Dilution	Distance (ft)	Dilution[a]	Salinity increment (ppt)	Dilution	Salinity increment (ppt)
Typical Discharge Scenarios								
C1	Brine + High GWR only	16.5	17.3	9.9	16.5	1.14	19.8	0.95
C2	Brine + High GWR + Low (1) SE	17.4	18.3	10.8	17.4	0.82	20.9	0.68
C3	Brine + High GWR + Low (2) SE	18.7	19.3	12.3	18.7	0.56	22.4	0.46
C4	Brine + High GWR + Low (3) SE	21.1	21.8	14.5	21.1	0.34	25.4	0.28
C5	Brine + High GWR + Low (4) SE	24.8	24.9	17.5	24.8	0.17	29.8	0.15
C6	Brine + High GWR + Mod (5) SE	33.2	31.7	23.5	31.7	0.06	38.0	0.05
C7	Brine + High GWR + Mod (5.3) SE	37.7	34.3	25.6	34.3	0.04	41.2	0.03
C8	Brine + High GWR + Mod (6) SE	113.5	68.5	53.5	68.5	0.00	82.2	0.00
C9	Brine + High GWR + Mod (7) SE[1]	-	-	-	-	-	-	-
C10	Brine + High GWR + High (11) SE[1]	-	-	-	-	-	-	-
C11	Brine + High GWR + High (15.92) SE[1]	-	-	-	-	-	-	-
C12	Brine + Low GWR only	16.3	16.9	9.5	16.3	1.22	19.6	1.02
C13	Brine + Low GWR + Low (1) SE	17.1	17.8	10.7	17.1	0.88	20.6	0.74
C14	Brine + Low GWR + Low (3) SE	20.6	21.1	13.9	20.6	0.38	24.7	0.31
C15	Brine + Low GWR + Mod (5.3) SE	34.1	32.6	24.1	32.6	0.05	39.1	0.04
C16	Brine + Low GWR + High (15.92) SE[1]	-	-	-	-	-	-	-
High Brine Discharge Scenarios (post-shutdown operations)								
C17	High Brine + High GWR only	16.2	17.0	10.0	16.2	1.23	19.5	1.02
C18	High Brine + High GWR + Low (0.5) SE	16.5	17.3	10.5	16.5	1.09	19.8	0.91
C19	High Brine + High GWR + Low (1) SE	17.0	17.8	11.1	17.0	0.95	20.4	0.79
C20	High Brine + High GWR + Low (2) SE	18.1	18.8	12.4	18.1	0.70	21.7	0.58
C21	High Brine + High GWR + Low (3) SE	19.6	20.2	14.0	19.6	0.50	23.5	0.41
C22	High Brine + High GWR + Low (4) SE	21.7	22.3	16.0	21.8	0.33	26.1	0.27
C23	High Brine + High GWR + Mod (5) SE	24.7	24.7	18.4	24.7	0.20	29.6	0.16
C24	High Brine + High GWR + Mod (6) SE	30.0	28.7	22.0	28.7	0.10	34.4	0.08
C25	High Brine + High GWR + Mod (7) SE	42.9	37.6	29.8	37.6	0.03	45.1	0.02
C26	High Brine + High GWR + Mod (8) SE[1]	-	-	-	-	-	-	-
C27	High Brine + High GWR + Mod (9) SE[1]	-	-	-	-	-	-	-
C28	High Brine + High GWR + High (10) SE[1]	-	-	-	-	-	-	-
C29	High Brine + High GWR + High (12) SE[1]	-	-	-	-	-	-	-
C30	High Brine + High GWR + High (14) SE[1]	-	-	-	-	-	-	-
C31	High Brine + High GWR + High (16) SE[1]	-	-	-	-	-	-	-

NOTES: SE = MRWPCA secondary effluent wastewater

1 See Table 5.5-9 for results of buoyant discharges.

SOURCE: Roberts, 2017.

All combined discharge scenarios under Alternative 5 are shown to have incremental salinities that would be lower than that assessed for the brine-only discharge (worst-case scenario, Scenario V1, **Table 5.5-5**). Dilution is increased and incremental salinity is reduced (as compared to the brine-only discharge scenario) as increasing fresh water in the form of GWR effluent and MRWPCA wastewater are co-mingled with the brine. For all combined discharge scenarios, the Ocean Plan salinity limit of 2 ppt is met within the ZID, the length of which ranges from approximately 10 to 30 feet from the outfall diffuser. Further, the computed salinities presented in **Table 5.5-8** would occur only along the seabed. Salinities decrease with height in the water column (see **Appendix D1** for details) and would only be above ambient close to the seabed. For most of the water column, incremental salinities would be much less than the conservative values in **Table 5.5-8**.

Positively buoyant plumes require different analytical procedures than are used for negatively buoyant plumes. The plume dynamics for these scenarios were assessed using the same procedure as that described under Impact 4.3-4 (see Section 4.3, Surface Water Hydrology and Water Quality). In summary, the internal hydraulics of the outfall diffuser was computed, and then the average diffuser port diameter and discharge flows were calculated. Model analyses were then run, accounting for effluent water quality characteristics and receiving water quality conditions.

The results, summarized in **Table 5.5-9**, show that when brine is combined with GWR effluent and moderate to high volumes of wastewater, dilution is high, the plume is positively buoyant and the discharges would not exceed the significance threshold of 2 ppt at the BMZ. These moderate to high volumes of wastewater flow occur during the non-irrigation season (November through March; **Table 4.3-9**).

Impact Summary and Conclusion for Salinity Impacts under Combined Discharge Scenarios

The analysis of salinity levels indicates that all discharges associated with the Alternative 5 combined discharge scenarios would result in salinity less than 2 ppt above ambient levels at the edge of the ZID (up to approximately 30 feet from the diffuser) and at the edge of the BMZ (328 feet from the diffuser). The Alternative 5 combined operational discharges from the MRWPCA outfall would therefore not exceed or violate the salinity standards or degrade water quality in terms of salinity. For all Alternative 5 combined discharge scenarios involving dense, negatively buoyant plumes (worst case scenarios), discharges would result in salinity increases of less than 2 ppt at the point where the discharge plume makes contact with the sea floor following discharge from the outfall diffuser ports and undergoes rapid mixing and dilution (edge of ZID). As discussed in detail under Impact 4.3-4, areas where salinity levels exceed 2 ppt would be confined to a relatively small area adjacent to each diffuser port and above the sea floor, after which the plumes attenuate rapidly with distance from each port. Also, the salinity increases presented here represent conservative values and would occur only along the seabed. For the majority of the water column, incremental salinities would be much lower than the reported values.

The current NPDES Permit (Order No. R3-2014-0013, NPDES Permit No. CA0048551) regulates the wastewater discharge from the existing outfall and would be amended to incorporate the specific effluent limitations, including salinity limitations for receiving waters. Further, implementation of **Mitigation Measure 4.3-4 (Operational Discharge Monitoring, Analysis, Reporting, and Compliance)** would ensure compliance with the monitoring requirements and regulatory standards protective of the beneficial uses of Monterey Bay.

TABLE 5.5-9
DILUTION MODEL RESULTS FOR ALTERNATIVE 5 COMBINED BUOYANT DISCHARGE SCENARIOS

Scenario No.	Scenario	Season	Effluent conditions: Flow (mgd)	Effluent conditions: Salinity (ppt)	Effluent conditions: Density (kg/m^3)	UM3 simulations: Average dilution	UM3 simulations: Rise height (centerline) (ft)	NRFIELD simulations: Minimum dilution	NRFIELD simulations: Rise height (centerline) (ft)	NRFIELD simulations: Rise height (top) (ft)
C9	Brine + High GWR + Mod (7) SE	Upwelling	17.16	31.23	1023.4	91	20	-	-	-
		Davidson				131	46	-	-	-
		Oceanic				91	18	-	-	-
C10	Brine + High GWR + High (11) SE	Upwelling	21.16	25.48	1018.7	107	33	-	-	-
		Davidson				159	65	-	-	-
		Oceanic				111	37	-	-	-
C11	Brine + High GWR + High (15.92) SE	Upwelling	26.08	20.82	1015.0	115	41	-	-	-
		Davidson				191	89	-	-	-
		Oceanic				124	49	-	-	-
C16	Brine + Low GWR + High (15.92) SE	Upwelling	25.85	20.95	1015.1	115	41	-	-	-
		Davidson				191	89	-	-	-
		Oceanic				124	49	-	-	-
C26	High Brine + High GWR + Mod (8) SE	Upwelling	20.41	32.71	1024.6	92	17	-	-	-
		Davidson				139	41	-	-	-
		Oceanic				101	15	-	-	-
C27	High Brine + High GWR + Mod (9) SE	Upwelling	21.41	31.22	1023.4	91	20	-	-	-
		Davidson				126	64	-	-	-
		Oceanic				91	18	-	-	-
C28	High Brine + High GWR + High (10) SE	Upwelling	22.41	29.87	1022.3	93	24	-	-	-
		Davidson				128	51	-	-	-
		Oceanic				90	21	-	-	-
C29	High Brine + High GWR + High (12) SE	Upwelling	24.41	27.48	1020.4	98	30	-	-	-
		Davidson				138	59	-	-	-
		Oceanic				101	31	-	-	-
C30	High Brine + High GWR + High (14) SE	Upwelling	26.41	25.46	1018.7	101	34	-	-	-
		Davidson				149	68	-	-	-
		Oceanic				106	38	-	-	-
C31	High Brine + High GWR + High (16) SE	Upwelling	28.4	23.73	1017.3	105	37	-	-	-
		Davidson				161	78	-	-	-
		Oceanic				110	43	-	-	-

NOTES: SE = MRWPCA secondary effluent wastewater

SOURCE: Roberts, 2017

Therefore, because all combined discharge scenarios involving GWR effluent under Alternative 5 would comply with salinity objectives after implementation of mitigation, the combined salinity-related water quality impact in Monterey Bay would result in the ***same impact conclusion*** compared to the proposed project, less than significant with mitigation.

Other Ocean Plan Constituents

Discharges through the existing MRWPCA outfall could violate water quality standards or waste discharge requirements, or otherwise degrade the water quality in Monterey Bay. Consistent with the approach to analysis described under Impact 4.3-5 (see Section 4.3, Surface Water Hydrology and Water Quality), this impact analysis uses the Ocean Plan water quality objectives, applied at the edge of the ZID, as significance thresholds for determining whether or not the discharges associated with Alternative 5 in combination with discharges from the GWR Project would result in a significant water quality impacts in Monterey Bay.

Based on the analysis, operational discharges under the combined discharge scenario (i.e., with GWR effluent included) would result in specific exceedances of Ocean Plan water quality objectives for a number of constituents. Exceedances of Ocean Plan water quality objectives were identified to occur for discharge scenarios that include brine-with-GWR effluent without MRWPCA wastewater, and brine-with-GWR effluent combined with low and moderate volumes of MRWPCA wastewater. The constituents that would exceed the Ocean Plan water quality objective (or the conservative 80 percent threshold) are ammonia, cyanide, acrylonitrile, bis(2-ethyl-hexyl)phthalate, chlordane, PCBs, TCDD equivalents, and toxaphene. For an additional eleven constituents[5], there is not enough information to assess concentrations at the edge of the ZID due to differences in MRLs used to assess the source waters or due to MRLs being higher than Ocean Plan objectives. Therefore, it is conservatively concluded that Ocean Plan water quality objectives could potentially be exceeded during operations for some operational discharge scenarios, resulting in a significant impact.

Combined Desalination Plant and GWR Operation and Discharge Scenarios

The combined discharge scenarios including brine and GWR effluent are summarized in **Table 5.5-8** and are assessed in this EIR/EIS. Additionally, potential discharge scenarios could include combinations of treated wastewater with GWR effluent or GWR effluent alone (i.e., without desalination brine). Specifically, it is possible that a GWR-only discharge of 0.94 mgd or 1.17 mgd of effluent could be discharged alone or discharged with varying volumes of treated wastewater from the MRWPCA Regional Wastewater Treatment Plant without brine from the Alternative 5 Desalination Plant. These scenarios have been previously modeled and impacts comprehensively assessed and documented under Impact HS-5 in Section 4.11.4.4 in the Final EIR for the GWR Project (MRWPCA and MPWMD, 2016; p. 4.11-78 *et se*q.). The GWR Project EIR concluded that discharges comprising GWR effluent and varying amounts of MRWPCA wastewater (i.e., discharges without brine present) would comply with the Ocean Plan water quality objectives and would have a less-than-significant impact on water quality in the Monterey Bay and Pacific Ocean. Further, the GWR Project EIR concluded there would be a beneficial impact on Monterey Bay

5 Chlorinated phenolics, 2,4-dinitrophenol, tributyltin, aldrin, benzidine, beryllium, bis(2-chloroethyl)ether, 3,3-dichlorobenzidine, 1,2-diphenylhydrazine, heptachlor, 2,4,6-trichlorophenol

since pollutant loads would be reduced compared to baseline discharges due to diversions of GWR source waters of marginal quality to the Regional Treatment Plant for treatment and disposal that would have otherwise flowed into Monterey Bay. A portion of the pollutants in the new source waters would be removed from the wastewater streams through the treatment processes and disposed of as solids to the adjacent landfill where they would no longer adversely affect Monterey Bay water quality. Therefore, the impact analysis for such discharge scenarios, as well as the results and impact conclusions relating to these scenarios, are not discussed further.

Approach to Analysis

Potential water quality impacts were identified by determining whether cumulative operational discharges would exceed the conservative threshold of 80 percent of the Ocean Plan water quality objective. **Figure 5.5-1** illustrates the approach to analysis and summarizes the water quality data sources for assessing cumulative discharge scenarios associated with Alternative 5.

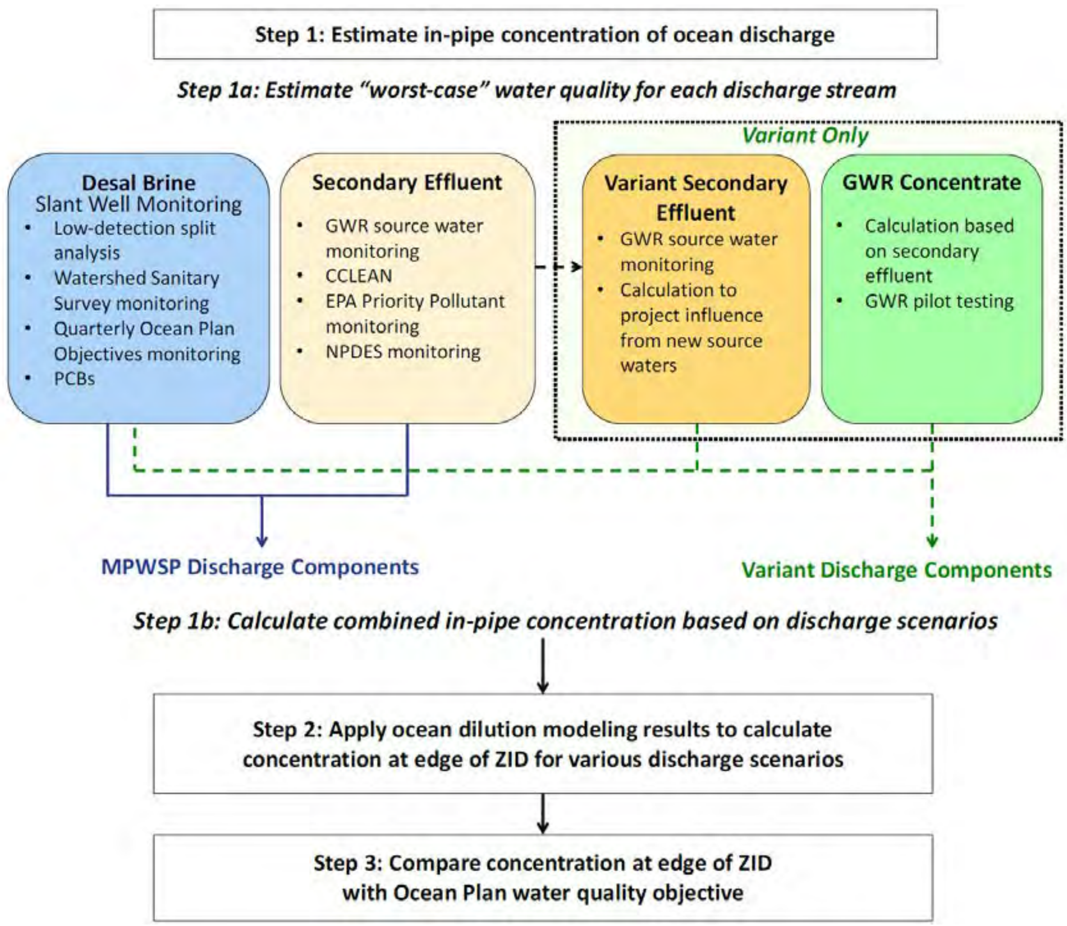

Figure 5.5-1
Summary of Approach to Analysis for
Determining Ocean Plan Compliance for
Alternative 5 and GWR Combined Discharge Scenarios

Results and Impact Discussion

The estimated concentrations for the full suite of Ocean Plan constituents are presented as concentrations at the edge of the ZID and as a percentage of the Ocean Plan numeric water quality objective in the revised **Appendix D3** (**Tables A3** and **A4**) for the combined discharge scenarios assessed under Alternative 5. The model analysis determined that discharges would not exceed Ocean Plan water quality objectives for the majority of constituents listed in **Table 4.3-4**. Most of the constituents in the desalination brine, GWR effluent, and MRWPCA wastewater were detected at levels sufficiently below the Ocean Plan objectives (i.e., were not detected in any of the component discharge source waters) that the operational discharges would pose no risk of exceeding the objectives for these constituents under the assessed discharge scenarios (**Appendix D3**, **Table 4**).

A number of constituents were identified at concentrations that have the potential to exceed the conservative threshold of 80 percent of the Ocean Plan objective (the significance threshold for this analysis) under the combined discharge scenario. The identified constituents of concern detected in the source waters are: ammonia, cyanide, acrylonitrile, bis(2-ethyl-hexyl)phthalate, chlordane, PCBs, TCDD equivalents, and toxaphene. **Table 5.5-10** presents these constituents along with the calculated concentration of each constituent at the edge of the ZID for a representative range of discharge scenarios. **Table 5.5-11** presents these constituents along with the calculated constituent concentration at the edge of the ZID expressed as a percentage of the Ocean Plan objective. Water quality constituents would exceed, or have the potential to exceed, the Ocean Plan objective when brine-with-GWR effluent would be discharged without MRWPCA wastewater or combined with low to moderate wastewater flows. When combined discharges included moderate to high flows of wastewater, no exceedances or potential exceedances were determined to occur.

For an additional eleven constituents, there is not enough information to assess concentrations at the edge of the ZID due to differences in MRLs used to assess the source waters or due to MRLs being higher than Ocean Plan objectives. Only future water quality testing and analysis, such as that required under the NPDES permit process, would determine whether discharges under the combined discharge scenarios associated with Alternative 5 would fully comply with Ocean Plan water quality objectives. Therefore, it must be conservatively concluded that, because the predictive models have shown that certain constituent concentrations would become elevated under combined discharge scenarios in excess of the conservative threshold of 80 percent of the Ocean Plan objective and because, there is not enough information to assess concentrations at the edge of the ZID for eleven constituents, the combination of Alternative 5 and the GWR Project could result in a significant water quality impact in Monterey Bay. However, as described below, the contribution of Alternative 5 to this impact would be mitigated through implementation of **Mitigation Measure 4.3-5** (**Implement Protocols to Avoid Exceeding Water Quality Objectives**) to a less-than-significant level.

TABLE 5.5-10
ALTERNATIVE 5 COMBINED OPERATIONAL DISCHARGE SCENARIOS: PREDICTED CONCENTRATIONS AT THE EDGE OF THE ZID FOR OCEAN PLAN CONSTITUENTS OF CONCERN

Constituent	Ocean Plan Objective	Estimated Percentage of Ocean Plan Objective at Edge of ZID by Flow Scenario[d]											
		Cumulative Operations with Normal Flows					Cumulative Operations with High Desal Brine Flows						
		C1	C3	C5	C8	C10	C11	C17	C19	C22	C27	C29	C31
Objectives for protection of marine aquatic life - 6-month median limit													
Cyanide (µg/L)	1	1.5	1.9	1.7	0.7	0.5	0.6	1.3	1.6	1.8	0.6	0.6	0.6
Ammonia (as N) – 6-mo median [a] (µg/L)	600	1593	1551	1248	473	326	316	1333	1363	1227	335	327	320
Objectives for protection of human health - carcinogens - 30-day average limit[c,d]													
Acrylonitrile [b] (µg/L)	0.1	0.1	0.1	0.1	0.03	0.02	0.02	0.1	0.1	0.1	0.02	0.02	0.02
Bis(2-ethyl-hexyl)phthalate (µg/L)	4	2.9	2.9	2.3	0.9	0.6	0.6	2.5	2.5	2.3	0.6	0.6	0.6
Chlordane (µg/L)	2.3E-05	5E-05	4E-05	4E-05	1E-05	9E-06	9E-06	4E-05	4E-05	4E-05	1E-05	9E-06	9E-06
PCBs (µg/L)	1.9E-05	3E-05	3E-05	2E-05	9E-06	6E-06	5E-06	3E-05	3E-05	2E-05	6E-06	6E-06	6E-06
TCDD Equivalents (µg/L)	3.9E-09	5E-09	5E-09	4E-09	2E-09	1E-09	1E-09	4E-09	4E-09	4E-09	1E-09	1E-09	1E-09
Toxaphene [c] (µg/L)	2.1E-04	3E-04	3E-04	2E-04	8E-05	5E-05	5E-05	2E-04	2E-04	2E-04	6E-05	5E-05	5E-05

NOTE: Shading indicates constituent is expected to be greater than 80 percent (orange shading) or exceed (red shading) the ocean plan objective for that discharge scenario.

a Ammonia (as N) represents the total ammonia concentration, *i.e.* the sum of unionized ammonia (NH_3) and ionized ammonia (NH_4).

b Acrylonitrile, beryllium, and TCDD equivalents represent a special case; they were detected in some source waters, but were also not detected above the MRL in others, and the MRL values were greater than the Ocean Plan objectives. For these constituents, a value of 0 was assumed when it was not detected in a source water and the MRL value was assumed where a non-detect occurred but the MRL was greater than the Ocean Plan objective. This assumption was made to show there is potential for the constituent to exceed the Ocean Plan objective in some flow scenarios.

c Toxaphene was only detected using the low-detection techniques of the CCLEAN program. It was detected once (09/2011) out of 12 samples collected from the secondary effluent from 2010 through 2015, and during the 7-day composite sample from the test slant well.

d Operational scenarios modeled for Ocean Plan compliance – C1: Brine + High GWR only; C3: Brine + High GWR + Low (2) SE; C5: Brine + High GWR + Low (4) SE; C8: Brine + High GWR + Mod (6) SE; C10: Brine + High GWR + High (11) SE; C11: Brine + High GWR + High (15.92) SE; C17: High Brine + High GWR only; C19: High Brine + High GWR + Low (1) SE; C22: High Brine + High GWR + Low (4) SE; C27: High Brine + High GWR + Mod (9) SE; C29: High Brine + High GWR + High (12) SE; C31: High Brine + High GWR + High (16) SE.

SOURCE: Trussell, 2017 (**Appendix D3**)

Impact Summary and Conclusion for Ocean Plan Constituents under Combined Discharge Scenarios

The analysis of potential water quality impacts evaluated a representative range of combined discharge scenarios. The model-based analyses concluded that under certain scenarios, some constituent concentrations would become elevated to levels greater than 80 percent of the Ocean Plan objective. Further, for an additional eleven constituents, there is not enough information to assess concentrations at the edge of the ZID due to differences in MRLs used to assess the source waters or due to MRLs being higher than Ocean Plan objectives. Therefore, it is conservatively concluded that Ocean Plan water quality objectives could potentially be exceeded during operations for some operational discharge scenarios, resulting in a significant impact. Therefore, Alternative 5

TABLE 5.5-11
ALTERNATIVE 5 COMBINED OPERATIONAL DISCHARGE SCENARIOS: PREDICTED CONCENTRATIONS AT THE EDGE OF THE ZID EXPRESSED AS PERCENTAGE OF OCEAN PLAN OBJECTIVE FOR OCEAN PLAN CONSTITUENTS OF CONCERN

Constituent	Ocean Plan Objective	Estimated Percentage of Ocean Plan objective at Edge of ZID by Flow Scenario[d]											
		Cumulative Operations with Normal Flows					Cumulative Operations with High Desal Brine Flows						
		C1	C3	C5	C8	C10	C11	C17	C19	C22	C27	C29	C31
Objectives for protection of marine aquatic life - 6-month median limit													
Cyanide (µg/L)	1	150%	189%	173%	71%	55%	56%	135%	158%	176%	55%	56%	57%
Ammonia (as N) – 6-month median[a] (µg/L)	600	266%	258%	208%	79%	54%	53%	222%	227%	205%	56%	54%	53%
Objectives for protection of human health - carcinogens - 30-day average limit													
Acrylonitrile[b] (µg/L)	0.1	94%	92%	74%	28%	19%	19%	79%	81%	73%	20%	19%	19%
Bis(2-ethyl-hexyl) phthalate (µg/L)	4	84%	81%	65%	25%	17%	17%	70%	72%	64%	18%	17%	17%
Chlordane (µg/L)	2.3E-05	199%	193%	155%	59%	40%	39%	167%	170%	153%	42%	40%	40%
PCBs (µg/L)	1.9E-05	169%	156%	121%	45%	30%	28%	149%	147%	124%	32%	30%	29%
TCDD Equivalents (µg/L)	3.9E-09	131%	128%	103%	39%	27%	26%	110%	112%	101%	28%	27%	26%
Toxaphene[c] (µg/L)	2.1E-04	126%	122%	98%	37%	26%	25%	105%	108%	97%	26%	26%	25%

NOTE: Shading indicates constituent is expected to be greater than 80 percent (orange shading) or exceed (red shading) the ocean plan objective for that discharge scenario.

a Ammonia (as N) represents the total ammonia concentration, *i.e.* the sum of unionized ammonia (NH_3) and ionized ammonia (NH_4).
b Acrylonitrile, beryllium and TCDD equivalents represent a special case; they were detected in some source waters, but were also not detected above the MRL in others, and the MRL values were greater than the Ocean Plan objectives. For these constituents, a value of 0 was assumed when it was not detected in a source water and the MRL value was assumed where a non-detect occurred but the MRL was greater than the Ocean Plan objective. This assumption was made to show there is potential for the constituent to exceed the Ocean Plan objective in some flow scenarios.
c Toxaphene was only detected using the low-detection techniques of the CCLEAN program. It was detected once (09/2011) out of 12 samples collected from the secondary effluent from 2010 through 2015, and during the 7-day composite sample from the test slant well.
d Operational scenarios modeled for Ocean Plan compliance – C1: Brine + High GWR only; C3: Brine + High GWR + Low (2) SE; C5: Brine + High GWR + Low (4) SE; C8: Brine + High GWR + Mod (6) SE; C10: Brine + High GWR + High (11) SE; C11: Brine + High GWR + High (15.92) SE; C17: High Brine + High GWR only; C19: High Brine + High GWR + Low (1) SE; C22: High Brine + High GWR + Low (4) SE; C27: High Brine + High GWR + Mod (9) SE; C29: High Brine + High GWR + High (12) SE; C31: High Brine + High GWR + High (16) SE

SOURCE: Trussell, 2017 (**Appendix D3**)

in combination with the GWR Project could result in a significant impact related to water quality standards, waste discharge requirements, and water quality in Monterey Bay and could exceed Ocean Plan water quality objectives for certain constituents under low wastewater flow conditions. Impacts would be reduced to a less-than-significant level by implementing **Mitigation Measure 4.3-5** (**Implement Protocols to Avoid Exceeding Water Quality Objectives**). Further, **Mitigation Measure 4.3-4** (**Operational Discharge Monitoring, Analysis, Reporting, and Compliance**), described under Impact 4.3-4 (Section 4.3, Surface Water Hydrology and Water Quality), would further reduce and minimize potential impacts by requiring CalAm to implement a comprehensive Monitoring and Reporting Plan, following approval by the RWQCB and MBNMS, to obtain field monitoring and marine biological resource data in the area affected by a project.

With implementation of **Mitigation Measure 4.3-5**, combined discharges of Alternative 5 and the GWR Project would comply with regulatory standards that would ensure combined impacts would be reduced to a less-than-significant level. Therefore, the combined discharges of Alternative 5 and the GWR Project would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Impacts of Full Cumulative Scenario

Cumulative impacts on hydrology and water quality for construction of Alternatives 5a and 5b would be the same as those described and analyzed for the proposed project and Alternative 1, respectively. Construction activities associated with either Alternative 5a or 5b would result in a less than significant contribution to any significant cumulative impact, after adherence to mandatory regulatory requirements and implementation of mitigation measures (*less than significant with mitigation*).

Alternative 5 (a and b) would have operation-related impacts on water quality similar to the proposed project, as analyzed in Section 4.3, Surface Water Hydrology and Water Quality), and Alternative 1. The cumulative projects whose water quality impacts could overlap with those of the combined discharges of Alternative 5 and the GWR Project include the same as those described for the proposed project (see Section 4.3.6 and **Table 4.1-2** for details). This analysis assumes that the GWR Project would be implemented and that operation of Alternative 5 would result in the combined discharge scenarios analyzed above under "Combined Impacts with GWR Project." Therefore, references to Alternative 5 operation in the following paragraph include operation of the GWR Project.

The contribution to cumulative impacts from operation of Alternative 5 would be similar, but reduced compared to those described for the proposed project due to the reduced volume of brine under Alternative 5. Nonetheless, cumulative impacts related to salinity and other water quality constituents in Monterey Bay would be significant, and the contribution of Alternative 5 to these impacts would be cumulatively significant for the same reasons described for the proposed project. Implementation of **Mitigation Measures 4.3-4** (**Operational Discharge Monitoring, Analysis, Reporting, and Compliance**) and **4.3-5** (**Implement Protocols to Avoid Exceeding Water Quality Objectives**) would ensure that operational discharges associated with Alternative 5 would comply with Ocean Plan water quality objectives, reducing the contribution of Alternative 5 to a level that is less than significant.

5.5.3.9 References

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5.5.4 Groundwater Resources

The evaluation criteria for groundwater resources address the depletion of groundwater quantity, and the degradation of groundwater quality as a result of construction activities, and from operations. All alternatives, including the proposed project, have the potential for limited water supply and quality impacts from the use and disposal of water during excavation, trenching, de-watering, well drilling and dust suppression activities. The proposed project, as well as alternatives that propose to draw source water through subsurface slant wells, have the potential for impacts during operations to groundwater supplies, groundwater levels and groundwater quality, that alternatives proposing open water intakes (Alternatives 2, 3, and 4) would not. This evaluation addresses the physical impacts on groundwater supplies, levels, and quality as a result of project construction and project pumping, and how potential effects of the project pumping might impact neighboring, active wells.

5.5.4.1 Setting/Affected Environment

The groundwater resources setting/affected environment for this alternatives analysis is similar to that described for the proposed project in Section 4.4, Groundwater Resources and generally includes the northern portion of the 150-mile-long Salinas Valley Groundwater Basin (SVGB), and the Seaside Groundwater Basin (SGB); specifically, the areas that could be affected by the installation and operation of the subsurface slant wells and the ASR wells (see **Figure 4.4-1**).

The proposed slant wells (at either the CEMEX or Potrero Road sites) would be located within the 84,400-acre, 132-square-mile subarea of the SVGB known as the 180/400 Foot Aquifer Subbasin (DWR, 2004), the boundaries of which (Elkhorn Slough to the north, the East Side Area to the east, the SGB to the south, and the Pacific Ocean to the west, although the precise locations fluctuate depending on seasonal variations, longer-term climate changes and local groundwater pumping) generally coincide with those of the SVGB Pressure Area (or Subbasin) traditionally recognized by the Monterey County Water Resources Agency (MCWRA) and California Department of Water Resources.

The Pressure Area includes three prominent water supply aquifers: the 180-Foot Aquifer, the 400-Foot Aquifer, and the deeper aquifers.[6] Shallow groundwater is present directly over the 180-Foot Aquifer, in the Dune Sands Aquifer which is about 60 feet thick at the locations of the proposed slant wells at CEMEX. As shown in **Figure 4.4-2**, the Dune Sands Aquifer transitions into a similar shallow aquifer underlying the Moss Landing Area to the north, referred to as the Perched-A Aquifer. The Perched-A Aquifer differs from the Dune Sand Aquifer in that it is underlain by a defined layer of less permeable, fine-grained sediments (clay) known as the Salinas Valley Aquitard. Water quality of the Perched-A Aquifer and Dune Sand Aquifer is directly influenced and controlled by seawater, as verified by the saline chemistry of the groundwater samples collected from borings drilled along the coast. The SVGB is in overdraft, meaning the existing basin outflow of 555,000 afy exceeds the estimated 504,000 afy of inflow;

6 The deeper aquifer units in the SVGB have been referred to as the “Deep Zone,” “900-Foot Aquifer,” and “1,500-Foot Aquifer.” For the purposes of this EIR/EIS, the term “deeper aquifers” is used to describe these units.

this imbalance is documented by seawater intrusion which has been detected several miles inland in the 180-Foot and 400-Foot aquifers.

The ASR-5 and ASR-6 Wells would be located in the SGB. The SGB encompasses 24 square miles at the southwest corner of the Salinas Valley, adjacent to the Pacific Ocean and is divided into four subareas, with the northern two composing the Northern Subbasin and the southern two composing the Southern Subbasin. The proposed ASR injection/extraction wells would be located near the northern border of the Northern Subbasin. There is a groundwater depression in both the shallow and deep aquifers in the Northern Subbasin, resulting in some landward flow along the coast.

5.5.4.2 Direct and Indirect Effects of the Proposed Project (10 slant Wells at CEMEX)

As described in detail in Chapter 3, Description of the Proposed Project, the proposed project (see **Figure 3-2**) would include construction of a desalination plant on 25 acres along Charles Benson Road northeast of the City of Marina that would create approximately 15 acres of impervious surfaces, up to nine new subsurface slant wells at the CEMEX active mining area and conversion of the existing test slant well to a permanent well; the eight operating slant wells (two wells would be on stand-by) would extract a total of approximately 24 mgd of source water.

The proposed project would also include two new injection/extraction wells (ASR-5 and ASR-6 Wells) at the existing SGB aquifer storage and recovery (ASR) system, Carmel Valley Pump Station and about 21 miles of new water conveyance pipelines.

The following paragraphs briefly summarize the impacts of the proposed project with respect to groundwater resources. The detailed impact analysis of the proposed project is provided in Section 4.4.

Impact 4.4-1: Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level during construction.

The proposed slant wells and ASR wells would be built using a dual-rotary drill rig that may require between 4 to 5 million gallons of water during the drilling, but could use much less, and perhaps none, depending on how the drilling proceeds. The water that may be required for ASR injection/extraction well construction would be less. If the proposed project requires well drilling water, it would be purchased from an outside water purveyor and delivered to the drill site by truck; water would not be extracted from local groundwater sources.

The proposed project pipelines and MPWSP Desalination Plant, and Carmel Valley Pump Station would be built using standard construction methods that would require water for dust suppression, concrete washouts, tire washing, and general site maintenance. Water for these operations would be purchased from a local water purveyor and delivered to each construction site by truck. No impacts on local groundwater supplies would occur.

Impact 4.4-2: Violate any groundwater quality standards or otherwise degrade groundwater quality during construction.

Construction of the slant wells would use drilling fluids, which would not adversely affect groundwater quality. Construction of the ASR-5 and ASR-6 Wells would use additives that are non-corrosive and biodegradable and do not contain chemicals that would degrade groundwater quality. Construction of all other facilities would not occur in groundwater-bearing zones and would have low potential to degrade groundwater quality. Impacts associated with discharges to groundwater and impacts on groundwater quality during construction would be less than significant for all project components.

Impact 4.4-3: Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level during operations so as to expose well screens and pumps.

The proposed slant wells would extract mostly seawater and some brackish groundwater from a capture zone that is within a localized area adjacent to the coast that currently contains highly brackish groundwater. The drawdown response from extraction of slant wells would occur in the Dune Sand and 180-FTE Aquifer. When water is returned to the Basin to replace the portion of the source water that originated in the Basin by providing desalinated water to Castroville Community Services District (CCSD) and/or to the Castroville Seawater Intrusion Project (CSIP) in lieu of an equal amount of groundwater pumping, groundwater levels in the 400-Foot Aquifer would improve. Localized depressed groundwater levels in the Dune Sands and 180-FTE aquifers would persist but the capture zone would eventually be recharged by seawater. The impact on groundwater supplies would be less than significant.

A localized water level decline of between 1 and 5 feet is expected as a result of proposed project pumping at CEMEX. Neighboring groundwater supply wells that could be affected by proposed project pumping have well screens and pumps that are considerably deeper than the depths at which localized changes in water levels could occur due to proposed project pumping. Proposed project pumping therefore, would not expose screens, cause damage, or reduce yield in neighboring groundwater supply wells and the impact on nearby water supply wells would be less than significant. However, to ensure that a groundwater monitoring program is in place before and during commencement of groundwater pumping operations and to verify that the subsurface intake system performs as expected, CalAm would implement **Applicant Proposed Measure 4.4-3 (Groundwater Monitoring and Avoidance of Well Damage)** which would establish baseline groundwater levels and detect changes to local groundwater elevations and quality, evaluate whether those changes could damage neighboring active wells and require a remedy to mitigate any damage.

Management of the rates and volumes of ASR injection and extraction would ensure that operation of the proposed ASR Wells would remain constant and, therefore, would not cause groundwater mounding, change groundwater gradients, or lower groundwater levels. Operational impacts associated with ASR Wells would be less than significant.

Operation of the proposed Desalination Plant, pipelines, or pump station would not interfere with, extract from, or inject water into the groundwater aquifers in the SVGB or the SGB. Consequently, there would be no impact associated with these facilities.

Impact 4.4-4: Violate any groundwater quality standards or otherwise degrade groundwater quality during operations.

Operation of the proposed slant wells would not violate water quality standards or interrupt or eliminate the potable or irrigation groundwater supply available to other basin users since current groundwater quality in the capture zone is highly brackish and the affected area is used minimally for groundwater extraction. The impact on local groundwater degradation would be less than significant.

Proposed project slant well pumping would not exacerbate seawater intrusion because the slant wells would capture seawater as it crosses the coast and proposed project pumping is therefore, expected to retard future inland migration of the seawater/freshwater interface. The impact on seawater intrusion would be less than significant.

The slant well pumping drawdown could interfere with inland remediation activities at existing groundwater contamination sites, by altering the localized groundwater gradients such that the existing contaminated groundwater plumes become drawn toward currently uncontaminated areas and degrade the existing water quality. This would violate the state non-degradation policy of maintaining the existing water quality. The North Marina Groundwater Model (NMGWM^{2016}) simulations indicate that a decrease in groundwater elevations is possible and could affect a Carbon Tetrachloride Plume located about 2 miles from the proposed slant wells in the former Fort Ord, resulting in a potentially significant impact. This impact would be reduced to less than significant with the implementation of **Mitigation Measure 4.4-4** (**Groundwater Monitoring and Avoidance of Impacts on Groundwater Remediation Plumes**), which would require monitoring for changes in the groundwater surface elevation caused by proposed project pumping near the plume.

Operation of the ASR Wells would not interfere with groundwater remediation activities since there are no known contaminated sites undergoing groundwater remediation in the area between the ASR wells and the edge of the groundwater depression. The injection of treated desalinated groundwater into the Santa Margarita Sandstone underlying the ASR Wells would have the same benign reaction as injecting treated Carmel River water. Therefore, groundwater quality impacts would be less than significant for the ASR Wells. All other project components would have no impact on groundwater quality during operations.

Impact 4.4-C: Cumulative impacts related to Groundwater Resources.

The geographic scope of the cumulative analysis for groundwater resources includes portions of the SVGB and the SGB. The geographic scope also includes a vertical element, which includes the underground aquifers in the SVGB and the SGB. In the SVGB, the aquifers of concern are the Dune Sand Aquifer, 180-FTE Aquifer, 180-Foot Aquifer (inland and east of CEMEX), and 400-Foot Aquifer. In the SGB, the aquifer of concern is the surficial shallow aquifer, which is in the unconfined Paso Robles Formation and the underlying confined Santa Margarita Sandstone. The current and reasonably foreseeable future projects listed in **Table 4.1-2** that are within the geographic scope and have the potential to combine with the groundwater-related impacts of the proposed project are the Salinas Valley Water Project Phase II (No. 1), the Interlake Tunnel (No. 24), and the Regional Urban Water Augmentation Project (RUWAP) Desalination Element (No. 31). These projects are located within the SVGB. The Interlake Tunnel project, which would produce additional surface water storage and supply for downstream groundwater recharge and reduction of saltwater intrusion in the SVGB, would not adversely affect groundwater resources. The proposed project, in combination with the other two identified cumulative projects, would not cause a significant adverse cumulative impact and the proposed project would not have a significant contribution to cumulative adverse groundwater quality and supply-related impacts; the proposed project, in combination with applicable cumulative projects, would have a cumulative beneficial effect on groundwater supply and quality.

5.5.4.3 Direct and Indirect Effects of the No Project Alternative

Under the No Project Alternative, no slant wells would be installed, resulting in no construction-related impacts and no operational drawdown/recharge effects in the Dune Sand Aquifer, the 180-Foot/180-FTE Aquifers or the 400-Foot Aquifer as a result of proposed project pumping. Because no water would be extracted by slant well pumping, no water that originated in the basin would be returned to the SVGB as in-lieu recharge; therefore, the projected beneficial groundwater response from that return water would not occur in the 400-Foot Aquifer. Seawater intrusion under the No Project Alternative would continue migrating inland as it does currently, and the SVGB would not benefit from the retardation of the inland migration afforded by the proposed project pumping. The ASR system would continue to operate as it does currently and the additional ASR wells would not be installed. CalAm would reduce its pumping from the SGB to 1,474 afy by 2021 per the terms of the CDO, and continue to extract its 1,474 afy adjudicated supply thereafter, rather than reducing pumping to 774 afy for 25 years. Therefore, the basin replenishment that would occur under the proposed project (17,500 af over the 25 years) would not occur under the No Project Alternative. Plumes of contaminated water beneath the former Fort Ord property would not be intersected or disrupted by proposed project pumping and ongoing remediation activities would continue. The No Project Alternative would not result in actions that would deplete groundwater supply or interfere with recharge, but also would not provide the beneficial effect of the proposed project on basin replenishment.

Although the No Project Alternative would have no adverse impact on groundwater compared to baseline conditions, because it would not have the benefit of retarding ongoing seawater intrusion compared to the proposed project, a brief discussion of the cumulative scenario under the No Project Alternative is included for purposes of comparison. Existing, ongoing regional groundwater pumping would continue throughout the Salinas Valley, as would efforts to develop a sustainable groundwater management plan. Projects such as the Pure Water Monterey GWR Project (No. 59 in **Table 4.1-2**) would be implemented. The GWR Project would provide additional irrigation water to the CSIP growers in the northern Salinas Valley that would raise groundwater levels in the 400-Foot Aquifer because of reduced groundwater pumping. This would be a beneficial effect of the GWR Project on groundwater levels in the SVGB; however, the No Project Alternative would not contribute to this cumulative beneficial effect.

5.5.4.4 Direct and Indirect Effects of Alternative 1 – Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.4.3). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**). Alternative 1 includes one additional well compared to the proposed project, because the existing test well at CEMEX would be converted to a permanent well. Therefore, the groundwater impact analysis of Alternative 1 focuses primarily on the slant wells at Potrero Road and the source water pipeline; however, impact conclusions are made for the whole of Alternative 1.

Construction Impacts

Groundwater Supply

Construction of Alternative 1 would use the same water supply sources as the proposed project (see Section 4.4, Groundwater Resources) for drilling the slant wells and for dust suppression; water would be delivered by truck and would not be extracted from local groundwater sources. Alternative 1 would have one additional new well at Potrero Road, and 5.5 miles of additional source water pipeline, and therefore, Alternative 1 would use more water during construction than the proposed project. However, because none of the water used during construction would be drawn from the groundwater basin, Alternative 1 would result in the ***same impact conclusion*** as the proposed project on groundwater supply during construction; no impact.

Water Quality

Similar to the proposed project, the Alternative 1 slant wells would be drilled using a dual rotary drill rig that would use re-circulated drilling fluids through the first approximately 100 feet of dry dune sands. The remaining length of borehole would be drilled using water present in the sands and added potable water to circulate the drill cuttings if necessary. If potable water were added, drill cuttings would be removed after use, and the water would be clarified and percolated into the sands through the diffuser in the parking lot; the quality of that water would be better than the underlying brackish water, and therefore, would not result in groundwater degradation.

Construction of Alternative 1 would use the same construction techniques as the proposed project, and would include 10 new slant wells drilled in a parking lot inland of the dunes (compared to the 9 new wells at CEMEX), as well as an additional 5.5 miles of source water pipeline. Because the water used for slant well drilling would be re-circulated and then clarified and discharged into the parking lot, Alternative 1 would result in the ***same impact conclusion*** on groundwater quality as the proposed project, less than significant.

Operational and Facility Siting Impacts

Groundwater Supply

Modeled Pumping Effects

The potential effects of the proposed project on groundwater resources were modeled with the North Marina Groundwater Model (version 2016, referred to as NMGWM^{2016}, see **Appendix E2**); the results are presented in Section 4.4, Groundwater Resources. The same model was used to evaluate the impacts on groundwater resources for this alternative at Potrero Road (see **Appendix E2**). Slant wells at Potrero Road would be screened in the Perched-A Aquifer and would only capture water from that aquifer and Monterey Bay (within MBNMS) due in part to the existence and thickness of the underlying Salinas Valley Aquitard (see **Appendix C3**) at this location. In contrast, the slant wells at the CEMEX site would have a capture zone in the Dune Sands Aquifer and the 180-Foot Equivalent Aquifer, because the Salinas Valley Aquitard does not underlie the CEMEX site. Sea level rise over the 63 years of modeled groundwater pumping would not change the projected drawdown in the Perched-A aquifer as it is expected to do at the CEMEX site, because sea level rise would not erode the coastline at Potrero Road and the shoreline would not advance inland toward the slant wells. As a result, the output for all modeling scenarios for Potrero Road shows no changes (unlike the proposed project) between the drawdown contours for current and future sea levels.

Effects on the Perched-A Aquifer

Slant well pumping at Potrero Road would create a cone of depression in the Perched-A Aquifer that would extend up to 5 miles inland, as shown in **Figure 5.5-2**.[7] The extent of modeled drawdown in the Perched-A Aquifer is almost twice the inland distance modeled at CEMEX for the proposed project because: 1) the Perched-A Aquifer is not as thick as the Dune Sand Aquifer underlying the CEMEX site, and 2) the ocean water capture zone is restricted at Potrero Road to the Perched-A Aquifer (the wells would not also be screened in the 180/180-FTE Aquifers) because the underlying Salinas Valley Aquitard separates the Perched-A Aquifer from the 180-Foot Aquifer. The capture zone created by the slant well pumping, as projected by the NMGWM^{2016}, would extend south along the coast, north to encompass Elkhorn Slough and inland approximately 2 miles, as shown on **Figure 5.5-2**. The 1-foot drawdown response would be similar in the Perched-A Aquifer with and without modeled return water scenarios (0, 3, 6, and 12 percent), because the resulting in-lieu recharge in the 400-Foot Aquifer would have a negligible effect on recharge in the Perched-A Aquifer. Modeling indicates that pumping under Alternative 1 would influence the Perched-A Aquifer north of Potrero Road and the cone of depression would encompass the mouth of the Elkhorn Slough and about 1 mile inland up the slough (a portion of which is within MBNMS). This effect is shown by the configuration of the model-projected capture zone and 1-foot drawdown contour lines on **Figures 5.5-2** and **5.5-3** and

[7] The full extent of the Dune Sand Aquifer cone of depression created by pumping 9.6 mgd under Alternative 1 is not shown because it extends out to and intersects a bedrock boundary condition near Prunedale.

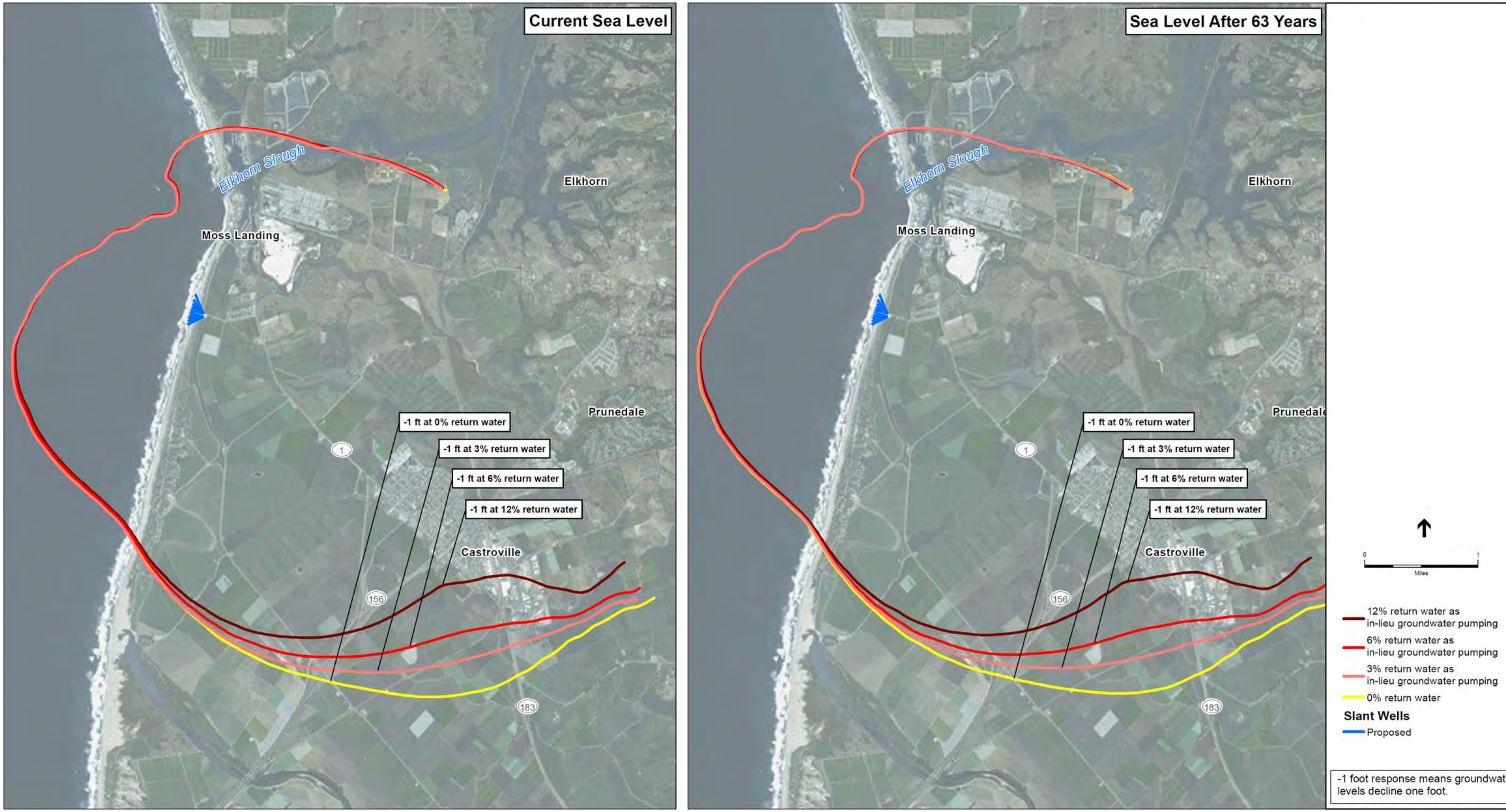
these results suggest a direct or indirect effect of project pumping at Potrero Road on the surface water-groundwater interaction in the Elkhorn Slough. For example, the slant well pumping at Potrero Road could draw in groundwater that would otherwise flow to recharge the Slough, or draw surface water directly from the Slough that would not occur under the proposed project. However, quantification of such an effect is not feasible within the context of the model given the location of Elkhorn Slough relative to the northern boundary of the NMGWM.

Effects on the 180-Foot Aquifer

Figure 5.5-3 shows the effects on the 180-Foot Aquifer from slant well pumping for Alternative 1, for varying percentages of Salinas Valley return water (0, 3, 6 and 12 percent return water). There would be no capture zone created because the proposed slant wells would be drawing water from the Perched-A Aquifer only. The modeled aquifer response shows a cone of depression that extends a maximum of about 4 miles inland with 0 percent return water, and the maximum extent of the cone is reduced by about 2 miles with increased percentages of return water. The modeled drawdown in the 180-Foot Aquifer is not directly due to project pumping because the slant wells at Potrero Road would not be screened in the 180-Foot Aquifer; rather, the water lost through extraction from the Perched-A Aquifer that would have otherwise infiltrated to and recharged the 180-Foot Aquifer may have been interpreted by the model as drawdown due to pumping. Similar to the effects on the Perched-A Aquifer, the response from slant well pumping (1-foot contour line at 0 percent and 3 percent return water) extends north to partially encompass the mouth of the Elkhorn Slough, indicating a possible surface water-groundwater interaction with the Slough. However, quantification of such an effect is not feasible within the context of the model given the location of Elkhorn Slough relative to the northern boundary of the NMGWM.

Pumping Response on 400-Foot Aquifer

Figure 5.5-4 shows the effects of the slant well pumping at Potrero Road on the 400-Foot Aquifer. The 1-foot drawdown contour, representing 0 percent return water, shows the largest area of drawdown extending about 2 miles inland and offshore about 0.75 mile. The 1-foot drawdown contour with 3 percent return water extends inland only about 1.5 miles and offshore about 0.5 mile. There is also a localized groundwater level increase in Castroville with 3 percent return water. The 1-foot contour resulting from 6 percent return water shows a groundwater level rise in Castroville, as does the 12 percent return water contour that is almost 5 miles in diameter. The response from slant well pumping, as shown by the 1-foot drawdown contour at 0 percent and 3 percent return water, extends north to partially encompass the mouth of the Elkhorn Slough. Given the depth of the 400-Foot Aquifer and the presence of the Salinas Valley Aquitard, it is unlikely that there would be a direct surface water-groundwater interaction between the Elkhorn Slough and the 400-Foot Aquifer. The water lost through extraction from the Perched-A Aquifer that would have otherwise infiltrated to and recharged the 400-Foot Aquifer was likely interpreted by the model as drawdown in the 400-Foot Aquifer and given the location of Elkhorn Slough relative to the northern boundary of the NMGWM, quantification is not feasible within the context of the model.

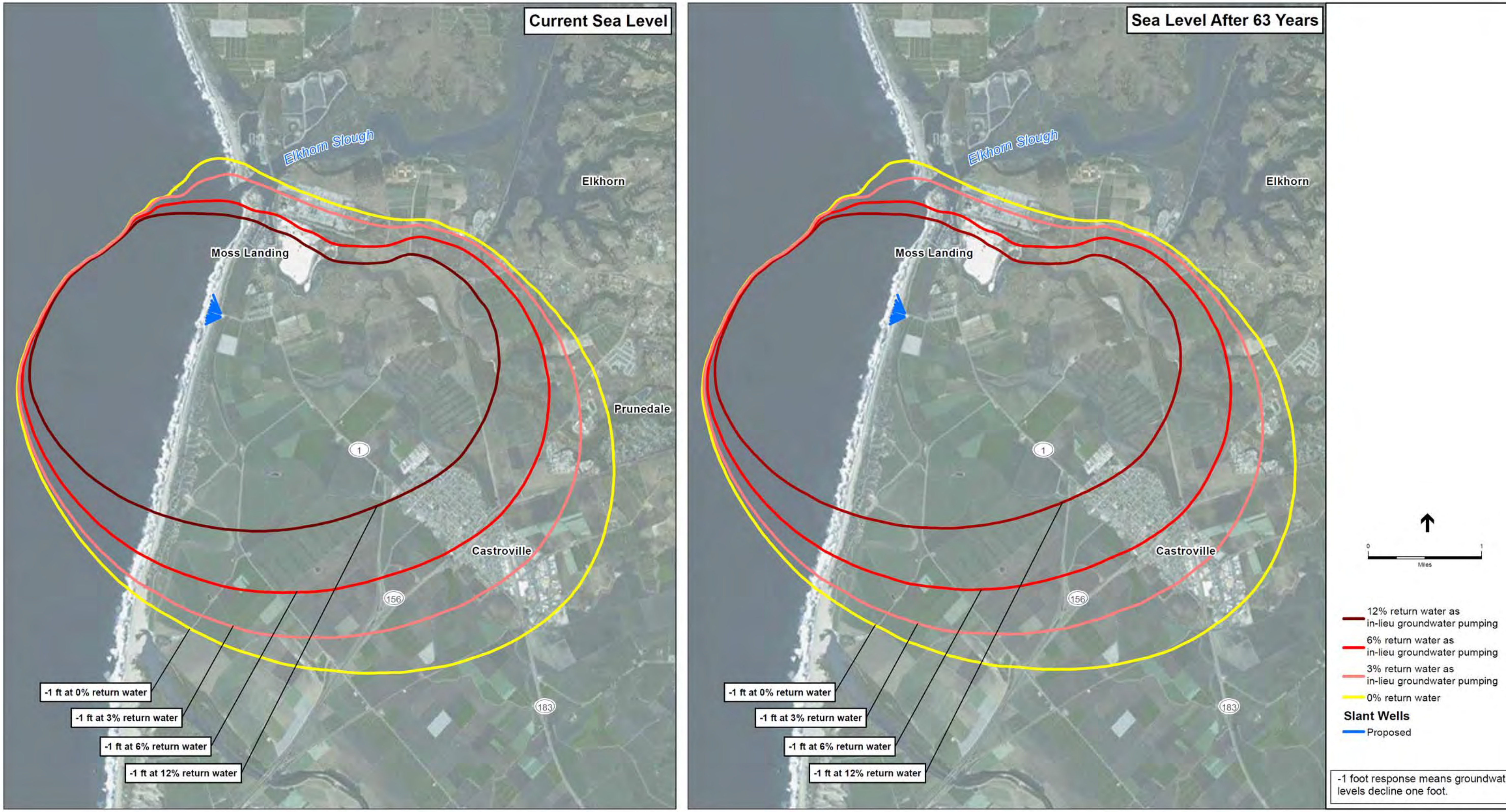


SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 5.5-2

Potrero Rd Slant Wells: 1-Foot Response in Dune Sand Aquifer under 24.1 MGD Pumping

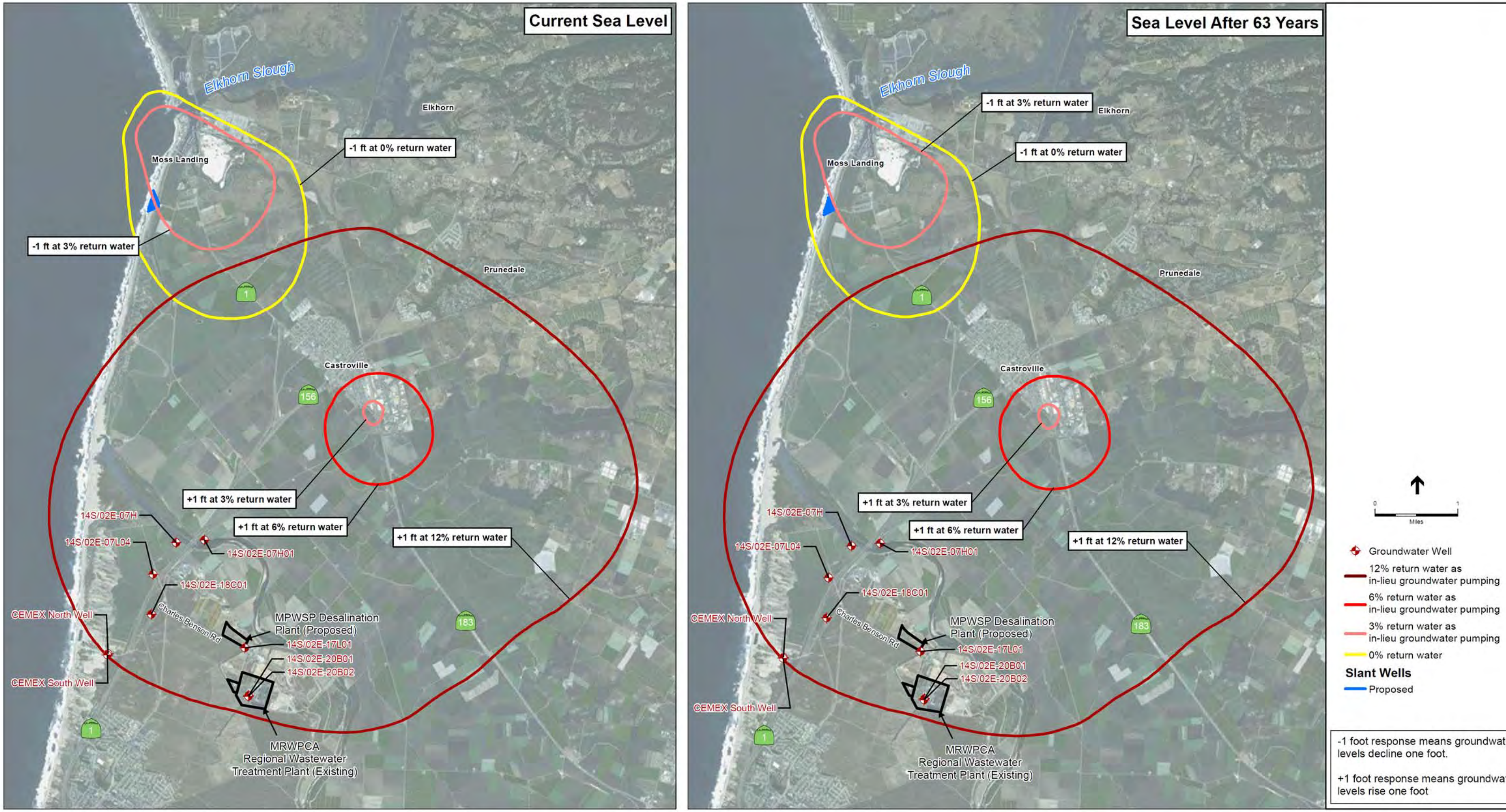


SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 5.5-3

Potrero Rd Slant Wells: 1-Foot Response in 180-Foot Aquifer under 24.1 MGD Pumping



SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 5.5-4
Potrero Rd Slant Wells: 1-Foot Response in 400-Foot Aquifer under 24.1 MGD Pumping

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Analysis and Conclusion of Operational Impacts

Pumping of slant wells at Potrero Road under Alternative 1 would extract mostly seawater and inland brackish water through its capture zone from an area where groundwater is not extracted for beneficial uses by others. There would be some degree of water level increase in areas of the 400-Foot Aquifer as a result of the Salinas Valley return water. No groundwater supply wells are currently pumping within the area of influence of the affected aquifers; therefore, Alternative 1 would have a reduced potential for impact on supply at nearby wells compared to the proposed project. However, like the proposed project, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant. However, like the proposed project, **Applicant Proposed Measure 4.4-3** (**Groundwater Monitoring and Avoidance of Well Damage**) would be implemented under Alternative 1, in recognition of the need to provide continued verification that project pumping from Alternative 1 would not impact groundwater levels in neighboring wells or contribute to seawater intrusion within the SVGB.

Water Quality

Similar to the proposed project, Alternative 1 would gradually and locally replace highly brackish groundwater with seawater as project pumping continues. However, this degradation would not violate water quality standards or interrupt or eliminate groundwater supply for other users. Groundwater modeling results show that Alternative 1 slant well pumping would hold back inland migration of the seawater intrusion front similar to the proposed project. However, because the boundary of the capture zone and cone of depression from the slant well pumping at Potrero Road would extend farther north than the proposed project, it would have a greater positive influence on the northern half of the seawater intrusion front compared to the proposed project because it would cover a larger area.

Unlike the proposed project, Alternative 1 groundwater extraction would occur too far north to interfere with groundwater remediation systems currently operating at the former Fort Ord Army base. Therefore, the Alternative 1 intake system would not interfere with active remediation systems or contaminant plumes, the impact would be decreased compared to the proposed project and **Mitigation Measure 4.4-4** (**Groundwater Monitoring and Avoidance of Impacts on Groundwater Remediation Plumes**) would not have to be implemented. Like the proposed project, operation of the ASR system would have a less-than-significant impact related to groundwater quality.

In summary, project pumping at Potrero Road, like the proposed project at CEMEX, would cause the brackish groundwater within the capture zone to become more saline, but not in violation of water quality standards; it would hold back seawater intrusion similar to the proposed project but would have a greater positive effect on the northern portion of the intrusion front; and it would eliminate the potential interference with existing contaminant plumes and remediation systems at the former Fort Ord military base as a result of slant well operation, eliminating the need for mitigation. Therefore, Alternative 1 would result in a ***reduced impact conclusion*** on groundwater quality compared to the proposed project, less than significant.

Cumulative Analysis

The geographic scope of the cumulative groundwater analysis for Alternative 1 impacts on groundwater supply and quality is the Perched-A Aquifer and coastal area supporting future groundwater and seawater extraction in the Moss Landing/Elkhorn Slough Area. As stated above, Alternative 1 would draw water from the Monterey Bay through the coastal sediment of the Perched-A Aquifer, resulting in a less-than-significant impact on the supply and quality of the water in this aquifer. However, no projects in **Table 4.1-2** in Section 4.1 are located in the same geographic area and have the potential to affect groundwater resources in the Perched-A Aquifer; thus, there would be no potential for cumulative impacts on this resource. Similarly, there are no known present or reasonably foreseeable future cumulative projects in the Santa Margarita Sandstone of the SGB; therefore, there would be no potential cumulative impacts on the SGB. Alternative 1 would have a ***reduced impact conclusion*** for cumulative impacts compared to the proposed project, no impact.

5.5.4.5 Direct and Indirect Effects of Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a screened open-water intake system consisting of an intake structure located on the seafloor in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water extracted by slant wells that originated in the SVGB, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**). Therefore, the groundwater resources impact analysis of Alternative 2 focuses primarily on the intake system and the source water pipeline; however, impact conclusions are made for the whole of Alternative 2.

Construction Impacts

Construction of Alternative 2 would use the same water supply sources as the proposed project (see Section 4.4, Groundwater Resources) for drilling the intake pipeline between the offshore intake structure and the new intake pump station on Dolan Road (as well as new two ASR wells). Alternative 2 would include 6.5 miles of additional source water pipeline, and therefore, would use more water during construction for dust suppression than the proposed project. Water would be delivered by truck and would not be extracted from local groundwater sources. Because none of the water used during construction would be drawn from the groundwater basin, Alternative 2 would result in the ***same impact conclusion*** as the proposed project on groundwater supply during construction; no impact.

The construction of the ASR injection/extraction wells would use the same techniques as the proposed project and would not result in groundwater quality degradation. The slant wells would not be drilled, but Alternative 2 would include a new subsurface intake pipeline and an additional 6.5 miles of source water pipeline which would increase the potential for impacts on groundwater quality compared to the proposed project. While pipeline trenches may encounter shallow groundwater, the construction operation of laying a pipeline and backfilling the trench would not release contaminants into the shallow groundwater zone. Therefore, impacts associated with discharges to groundwater and impacts on groundwater quality during construction of Alternative 2 would result in the ***same impact conclusion*** on groundwater quality compared to the proposed project, less than significant.

Operational and Facility Siting Impacts

Alternative 2 would include a screened open water intake, would not extract source water from groundwater aquifers, and would not include in-lieu recharge of the 400-Foot aquifer because Salinas Valley return water would not be required; the open water intake would not deplete groundwater supplies or interfere with groundwater recharge. Operation of Alternative 2 would have no impact on local groundwater levels in the SVGB, a reduced potential for impact compared to the proposed project. The ASR Wells, however, would be operated the same as the proposed project to prevent mounding and over-extraction. Therefore, Alternative 2 would result in the ***same impact conclusion*** on groundwater supplies compared to the proposed project, less than significant. **Applicant Proposed Measure 4.4-3** would not be relevant and therefore would not be implemented.

Operation of the screened open water intake would not adversely affect groundwater quality. In fact, unlike the proposed project and Alternative 1, the Alternative 2 screened open water intake would not capture seawater from the seawater-intruded aquifers that would otherwise migrate inland, and Alternative 2 therefore would not temper the continued inland migration of the seawater intrusion front. Unlike the proposed project, the Alternative 2 intake system would not affect the remediation of the contaminated plumes because it would not affect groundwater levels in the SVGB, and **Mitigation Measure 4.4-4** (**Groundwater Monitoring and Avoidance of Impacts on Groundwater Remediation Plumes**) would not need to be implemented. Like the proposed project, operation of the ASR system would have a less-than-significant impact related to groundwater quality. Therefore, the operation of Alternative 2 would result in a ***reduced impact conclusion*** with respect to groundwater quality compared to the proposed project, less than significant.

Cumulative Analysis

Because Alternative 2 would not require the construction of subsurface slants wells for the intake system and would extract water directly from an open-water intake, it would have no impact within the SVGB, and could not contribute to a cumulative effect on groundwater supply or quality within the SVGB. There are no known present or reasonably foreseeable future cumulative projects in the Santa Margarita Sandstone of the SGB; therefore, a cumulative analysis is not relevant to the components of Alternative 2 affecting the SGB. Alternative 2 would have a ***reduced impact conclusion*** for cumulative impacts compared to the proposed project, no impact/not relevant.

5.5.4.6 Direct and Indirect Effects of Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The pipelines for the intake and discharge systems would be installed using HDD. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the “Connection to CalAm” Point on **Figure 5.4-3**, ASR facilities, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water extracted by slant wells that originated in the SVGB, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**).

Construction Impacts

Construction of Alternative 3 would use the same water supply sources as the proposed project (see Section 4.4, Groundwater Resources) for installing the intake and brine discharge pipelines between the offshore intake and brine discharge structures and the new pump station on Dolan Road (as well as the ASR-5 and -6 wells). Alternative 3 would include 31.5 miles of additional pipelines, and therefore, would use more water during construction for dust suppression than the proposed project. However, like the proposed project, water would be delivered by truck and would not be extracted from local groundwater sources. Because none of the water used during construction would be drawn directly from the groundwater basin, Alternative 3 would result in the ***same impact conclusion*** as the proposed project on groundwater supply during construction; no impact.

The construction of the ASR injection/extraction wells would use the same techniques as the proposed project and would not result in groundwater quality degradation. No slant wells would be drilled, but Alternative 3 would include new subsurface intake and discharge pipelines and an additional 31.5 miles of pipeline which would increase the potential for impacts on groundwater quality during construction compared to the proposed project. While pipeline trenches may encounter shallow groundwater, the construction operation of laying a pipeline and backfilling the trench would not release contaminants into the shallow groundwater zone. Therefore, impacts associated with discharges to groundwater and impacts on groundwater quality during construction of Alternative 3 would result in the ***same impact conclusion*** on groundwater quality as the proposed project, less than significant.

Operational and Facility Siting Impacts

Alternative 3 would include a screened open water intake, and thus would not extract source water from groundwater aquifers and would not include in-lieu recharge of the 400-Foot aquifer because Salinas Valley return water would not be required; the open water intake would not deplete groundwater supplies or interfere with groundwater recharge. Operation of Alternative 3 would have no impact on local groundwater levels in the SVGB, a reduced potential for impact compared to the proposed project. The ASR Wells, however, would be operated the same as the proposed project to prevent mounding and over-extraction. Therefore, Alternative 3 would result in the ***same impact conclusion*** on groundwater supplies compared to the proposed project, less than significant. **Applicant Proposed Measure 4.4-3** would not be relevant and therefore would not be implemented.

Operation of the screened open water intake would not adversely affect groundwater quality. In fact, unlike the proposed project and Alternative 1, the Alternative 3 screened open water intake would not capture seawater from the seawater-intruded aquifers that would otherwise migrate inland, and Alternative 3 therefore would not temper the continued inland migration of the seawater intrusion front. Unlike the proposed project, Alternative 3 would not affect the remediation of the contaminated plumes because it would not affect groundwater levels in the SVGB, and **Mitigation Measure 4.4-4** (**Groundwater Monitoring and Avoidance of Impacts on Groundwater Remediation Plumes**) would not need to be implemented. Like the proposed project, operation of the ASR system would have a less-than-significant impact related to groundwater quality. Therefore, the operation of Alternative 3 would result in a ***reduced impact conclusion*** with respect to groundwater water quality compared to the proposed project, less than significant.

Cumulative Analysis

Because Alternative 3 would not require the construction of subsurface slant wells for the intake system and would extract water directly from an open-water intake, it would have no impact within the SVGB, and could not contribute to a cumulative effect on groundwater supply or quality within the SVGB. There are no known present or reasonably foreseeable future cumulative projects in the Santa Margarita Sandstone of the SGB; therefore, a cumulative analysis is not relevant to the components of Alternative 3 affecting the SGB. Alternative 3 would have a ***reduced impact conclusion*** for cumulative impacts compared to the proposed project, no impact/not relevant.

5.5.4.7 Direct and Indirect Effects of Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water extracted by slant wells that originated in the SVGB, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**).

Construction Impacts

Construction of Alternative 4 would use the same water supply sources as the proposed project (see Section 4.4, Groundwater Resources) for installing the intake and brine discharge pipelines between the offshore intake and brine discharge structures and the existing caisson at the end of Sandholdt Road, and between the existing caisson and the desalination plant (as well the ASR-5 and -6 wells). Alternative 3 would include 6.5 miles of additional pipeline, and therefore, would use more water during construction for dust suppression than the proposed project. However, like the proposed project, water would be delivered by truck and would not be extracted from local groundwater sources. Because none of the water used during construction would be drawn directly from the groundwater basin, Alternative 4 would result in the ***same impact conclusion*** as the proposed project on groundwater supply during construction; no impact.

The construction of the ASR injection/extraction wells would use the same techniques as the proposed project and would not result in groundwater quality degradation. No slant wells would be drilled, but Alternative 4 would include rehabilitated as well as new intake and discharge pipelines and an additional 6.5 miles of pipeline which would increase the potential for impacts on groundwater quality compared to the proposed project. While pipeline trenches may encounter shallow groundwater, the construction operation of laying a pipeline and backfilling the trench would not release contaminants into the shallow groundwater zone. Therefore, impacts associated with discharges to groundwater and impacts on groundwater quality during construction of Alternative 4 would result in the ***same impact conclusion*** on groundwater quality as the proposed project, less than significant.

Operational and Facility Siting Impacts

Alternative 4 would include a screened open water intake, and thus would not extract source water from groundwater aquifers and would not include in-lieu recharge of the 400-Foot aquifer because Salinas Valley return water would not be required; the open water intake would not deplete groundwater supplies or interfere with groundwater recharge. Operation of Alternative 4 would have no impact on local groundwater levels in the SVGB, a reduced potential for impact compared to the proposed project. The ASR Wells, however, would be operated the same as the proposed project to prevent mounding and over-extraction. Therefore, Alternative 4 would result in the ***same impact conclusion*** on groundwater supplies compared to the proposed project, less than significant. **Applicant Proposed Measure 4.4-3** would not be relevant and therefore would not be implemented.

Operation of the screened open water intake would not adversely affect groundwater quality. In fact, unlike the proposed project and Alternative 1, the Alternative 4 screened open water intake would not capture seawater from the seawater-intruded aquifers that would otherwise migrate inland, and Alternative 4 therefore would not temper the continued inland migration of the seawater intrusion front. Unlike the proposed project, Alternative 4 would not affect the remediation of the contaminated plumes because it would not affect groundwater levels in the SVGB, and **Mitigation Measure 4.4-4** (**Groundwater Monitoring and Avoidance of Impacts on Groundwater Remediation Plumes**) would not need to be implemented. Like the proposed project, operation of the ASR system would have a less-than-significant impact related to groundwater quality. Therefore, the operation of Alternative 4 would result in a ***reduced impact conclusion*** with respect to groundwater water quality compared to the proposed project, less than significant.

Cumulative Analysis

Because Alternative 4 would not require the construction of subsurface slant wells for the intake system and would extract water directly from an open-water intake, it would have no impact within the SVGB, and could not contribute to a cumulative effect on groundwater supply or quality within the SVGB. There are no known present or reasonably foreseeable future cumulative projects in the Santa Margarita Sandstone of the SGB; therefore, a cumulative analysis is not relevant to the components of Alternative 4 affecting the SGB. Alternative 4 would have a ***reduced impact conclusion*** for cumulative impacts compared to the proposed project, no impact/not relevant.

5.5.4.8 Direct and Indirect Effects of Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction Impacts

Construction of Alternatives 5a and 5b would use the same water supply sources as the proposed project (see Section 4.4, Groundwater Resources) and Alternative 1 for drilling the slant wells and for dust suppression; water would be delivered by truck and would not be extracted from local groundwater sources. Alternatives 5a and 5b would have fewer new wells than the proposed project or Alternative 1, and Alternative 5b would have 5.5 miles of additional source water pipeline and would use more water during construction than Alternative 5a or the proposed project. However, because none of the water used during construction would be drawn from the groundwater basin, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project on groundwater supply during construction; no impact.

Similar to the proposed project and Alternative 1, slant wells would be drilled using a dual rotary drill rig that would use re-circulated drilling fluids through the first approximately 100 feet of dry dune sands. The remaining length of borehole would be drilled using water present in the sands and added potable water to circulate the drill cuttings if necessary. If potable water were added, drill cuttings would be removed after use, and the water would be clarified and percolated into the sands through the diffuser in the parking lot; the quality of that water would be better than the underlying brackish water, and therefore, would not result in groundwater degradation.

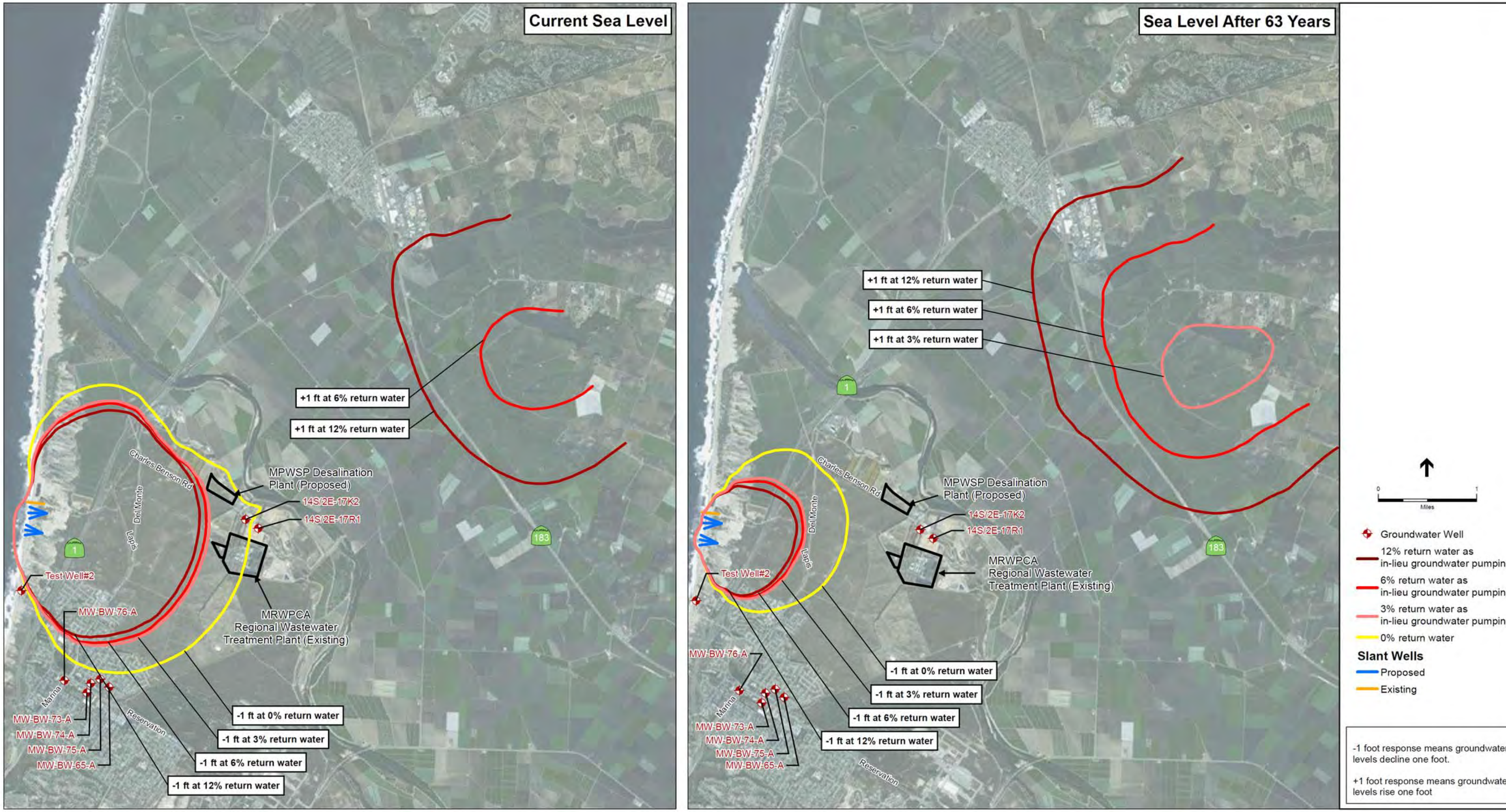
Construction of Alternatives 5a and 5b would use the same construction techniques as the proposed project, but would include 6 new slant wells at CEMEX (compared to 9 new wells for the proposed project) or 7 new slant wells drilled in the Potrero Road parking lot inland of the dunes (compared to 10 new wells for Alternative 1), as well as an additional 5.5 miles of source water pipeline for Alternative 5b. Because the water used for slant well drilling would be re-circulated and then clarified and discharged into the beach or parking lot, Alternatives 5a and 5b would result in the ***same impact conclusion*** on groundwater quality as the proposed project, less than significant.

Operational and Facility Siting Impacts

Like the proposed project, the operation of Alternative 5a (reduced wells at CEMEX) would create a modeled aquifer response in the Dune Sand Aquifer, 180-FTE Aquifer and 400-Foot Aquifer as shown in **Figures 5.5-5** through **5.5-7**. The size of the capture zone and cone of depression created by Alternative 5a would be similar to or less pronounced than the modeled response (depending on the aquifer) for the proposed project, and similar to the proposed project, no existing active wells would be affected.

The capture zone and the cone of depression resulting from slant well pumping at Potrero Road in Alternative 5b (**Figures 5.5-8** through **5.5-10**), would be similar to or less pronounced than Alternative 1 and no existing wells would be affected. However, as a result of the surface water/groundwater interface, Alternative 5b pumping at Potrero Road, like Alternative 1, would result in loss of water at Elkhorn Slough (see also the potential implications of this effect, in Section 5.5.3, Surface Water Hydrology and Water Quality, and Section 5.5.5, Marine Biological Resources), the impacts of which cannot be quantified because of the location at the boundary of the model domain. However, Alternatives 5a and 5b would not affect neighboring well levels and would result in the ***same impact conclusion*** on groundwater supply compared to the proposed project, less than significant. CalAm would still implement **Applicant Proposed Measure 4.4-3 (Groundwater Monitoring and Avoidance of Well Damage)** in recognition of the need to provide continued verification that project pumping from Alternatives 5a and 5b would not impact groundwater levels in neighboring wells or contribute to seawater intrusion within the SVGB.

Like the proposed project and Alternative 1, reduced project pumping at CEMEX (Alternative 5a) at Potrero Road (Alternative 5b), would, over time, draw seawater into the capture zone causing the brackish groundwater to increase in salinity. Alternatives 5a and 5b would have less of an effect on seawater intrusion than the proposed project and Alternative 5b would have a greater positive effect on the northern portion of the intrusion front than Alternative 5a. Alternative 5b would eliminate the proposed project's potential interference with existing contaminant plumes and remediation systems at the former Fort Ord military base. Therefore, Alternative 5a would result in the ***same impact conclusion*** on groundwater quality compared to the proposed project, less than significant with mitigation. By contrast, Alternative 5b would have a ***reduced impact conclusion*** on groundwater quality compared to the proposed project, less than significant.



SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 5.5-5

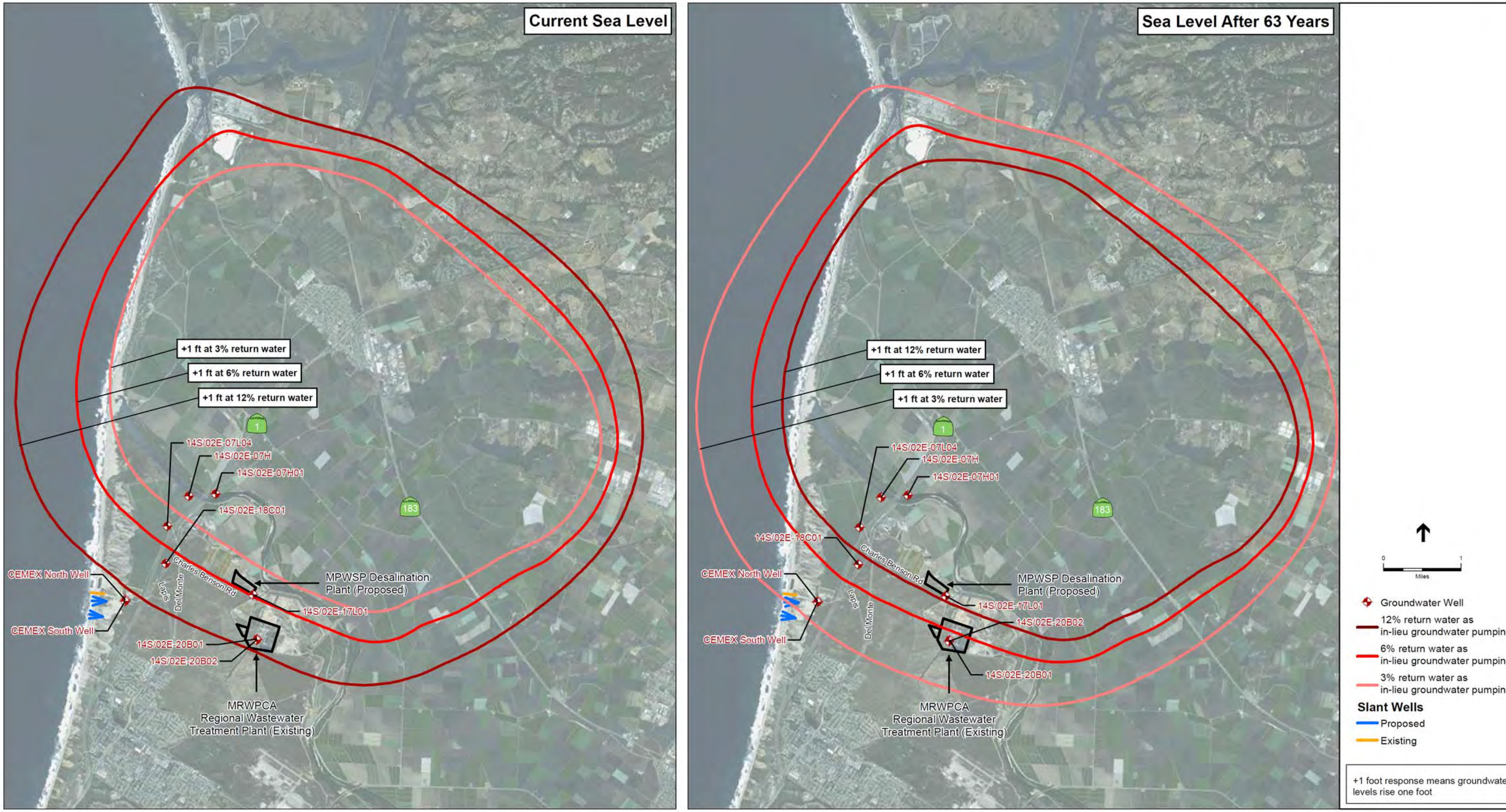
Alternative 5a Site: 1-Foot Response in Dune Sand Aquifer under 15.5 MGD Pumping

SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 5.5-6

Alternative 5a Site: 1-Foot Response in 180-Foot Aquifer under 15.5 MGD Pumping

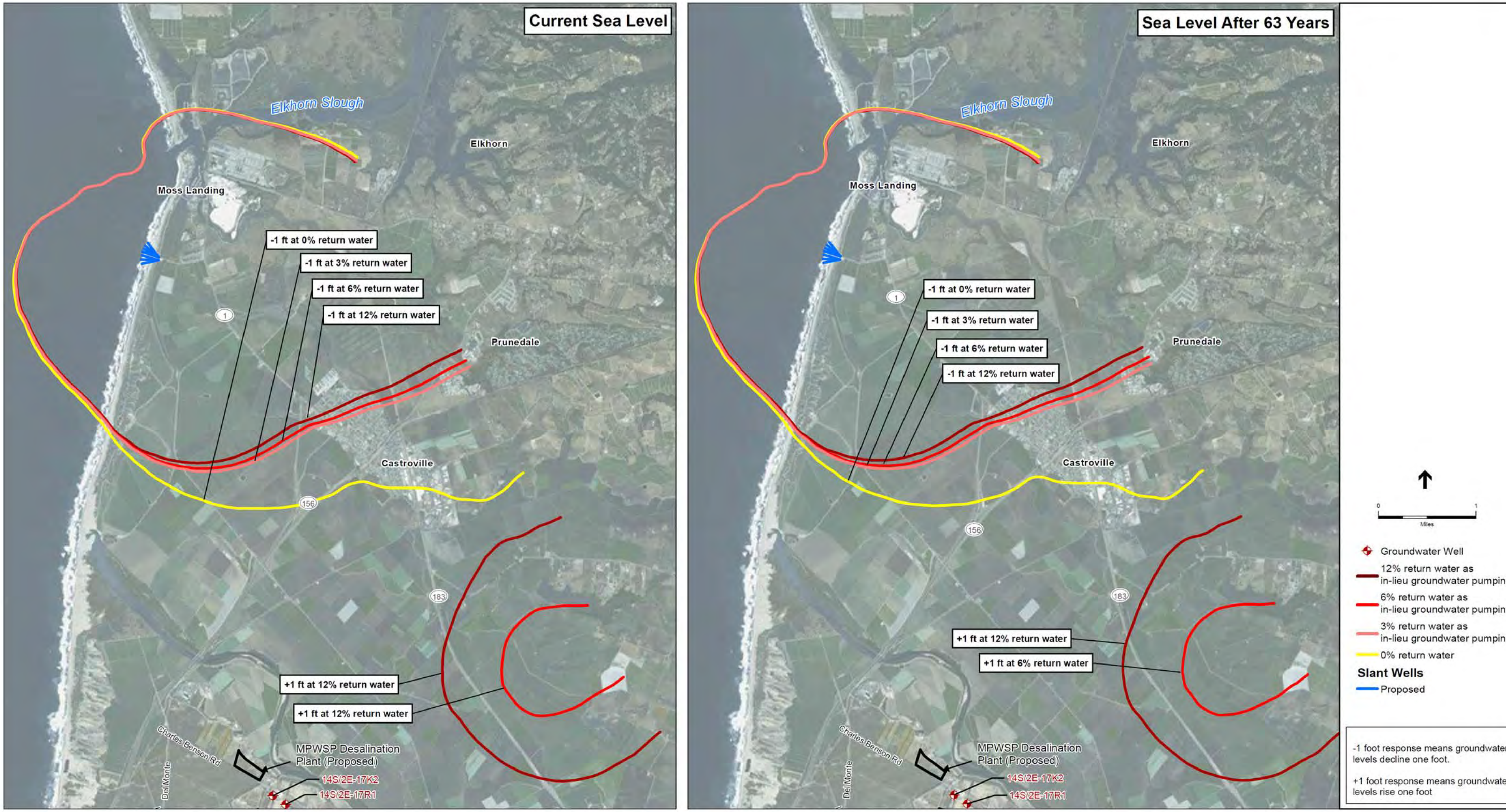


SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 5.5-7

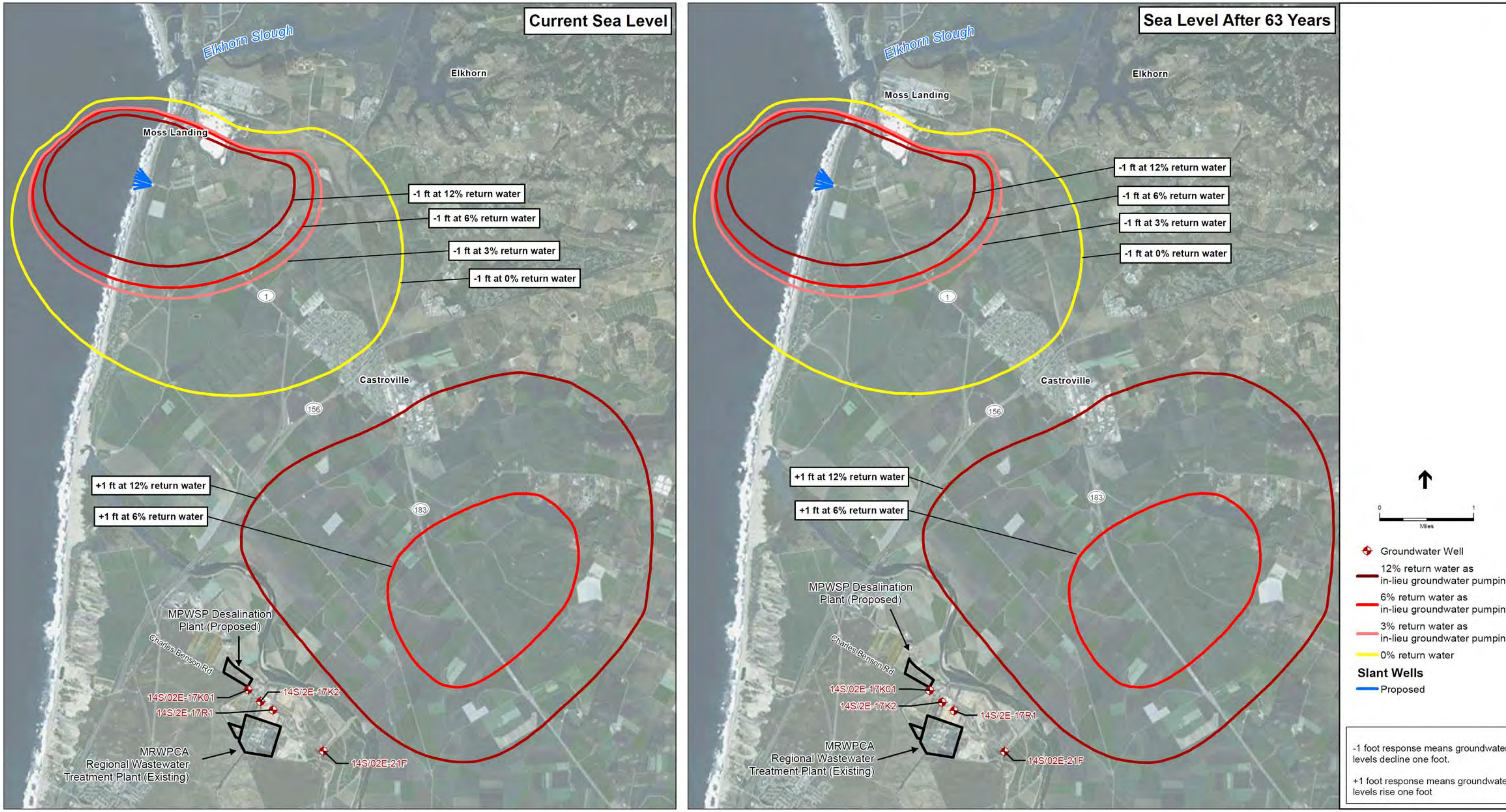
Alternative 5a Site: 1-Foot Response in 400-Foot Aquifer under 15.5 MGD Pumping



SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

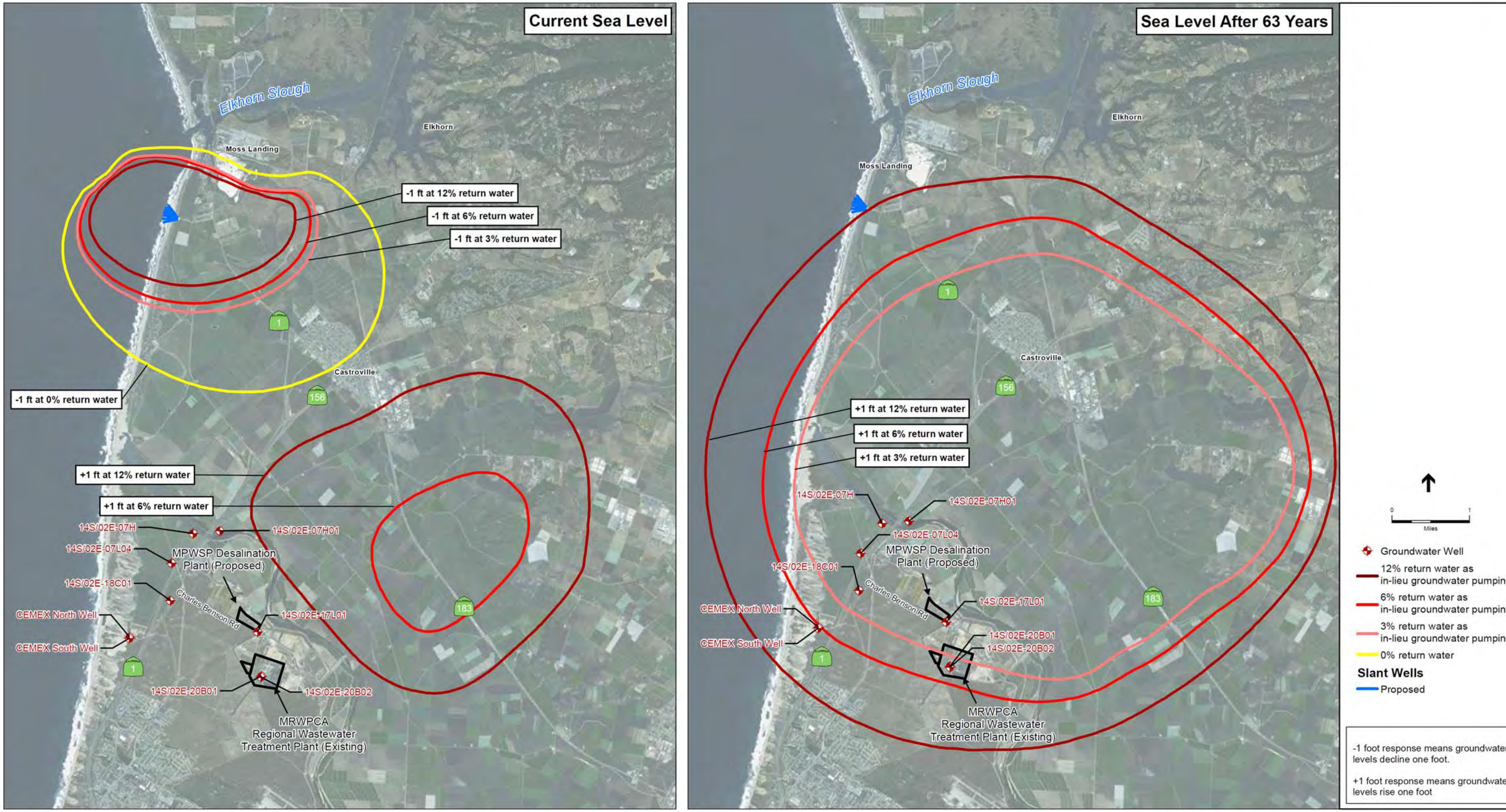
Figure 5.5-8
Alternative 5b Slant Wells: 1-Foot Response in Dune Sand Aquifer under 15.5 MGD Pumping



SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 5.5-9
Alternative 5b Slant Wells: 1-Foot Response in 180-Foot Aquifer under 15.5 MGD Pumping



SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 5.5-10

Alternative 5b Slant Wells: 1-Foot Response in 400-Foot Aquifer under 15.5 MGD Pumping

Cumulative Analysis

Combined Impacts with GWR Project

With the implementation of the GWR Project, groundwater levels in the 400-Foot Aquifer would rise because of the additional irrigation water provided to the CSIP area, resulting in a less-than-significant impact that is improved compared to Alternative 5 alone and to the proposed project. All other groundwater impacts would be the same in this combined scenario as under Alternative 5 alone.

Impacts of Full Cumulative Scenario

No additional projects would be relevant to the cumulative scenario compared to those addressed in Section 4.4.6 (for the proposed project, relevant to Alternative 5a) and Section 5.5.4.4 (for Alternative 1, relevant to Alternative 5b). In summary, Alternative 5a would result in improved groundwater levels compared to the proposed project because of the improved cumulative effects resulting from the contribution of the GWR Project, and thus would result in the ***same impact conclusion*** as the proposed project for cumulative impacts on groundwater resources, less than significant.

Although Alternative 5b would result in the same type of groundwater impacts as Alternative 5a, Alternative 5b would affect groundwater in the Perched-A Aquifer, and because no other projects would affect this resource, a cumulative impact analysis is not relevant to this impact. Thus, Alternative 5b would have a ***reduced impact conclusion*** for cumulative impacts compared to the proposed project, no impact/not relevant.

5.5.4.9 References

Department of Water Resources (DWR), 2004. *California's Groundwater, Bulletin 118, Central Coast Hydrologic Region, Salinas Valley Groundwater Basin, 180/400 Foot Aquifer Subbasin.* February 27, 2004.

Monterey Peninsula Water Management District, 2016. Addendum to the Aquifer Storage and Recovery Project Environmental Impact Report/Environmental Assessment and the Pure Water Monterey/Groundwater Replenishment Project Environmental Impact Report for the Hilby Avenue Pump Station. http://www.mpwmd.net/asd/board/boardpacket/2016/20160620/16/Item-16-Exh-A.pdf.

Monterey Regional Water Pollution Control Agency and Monterey Peninsula Water Management District, 2016. Consolidated Final Environmental Impact Report for the Pure Water Monterey Groundwater Replenishment Project, Volume IV, Exhibit B. http://purewatermonterey.org/wp/wp-content/uploads/Volume-IV-EIR-Certification-and-Project-Approval-Jan-2016.pdf.

United States Geological Survey (USGS), 2011. *Status and Understanding of Groundwater Quality in the Monterey Bay and Salinas Valley Groundwater Basins, 2005: California GAMA Priority Basin Project,* Scientific Investigations Report 2011-5058, 2011.

5.5.5 Marine Biological Resources

The evaluation criteria for marine biological resources address the effects from construction and operation on: any identified marine species, natural community or habitat, including candidate, sensitive or special status species; sustainability of marine species' community or population; and interference with movement of marine species or effects on nursery sites.

5.5.5.1 Setting/Affected Environment

The marine resources study area for the proposed project encompasses the nearshore waters (within 5 miles from shore) of Monterey Bay and extends from the Salinas River southward to the northern limits of Sand City and is described in Section 4.5.1. Several alternatives propose offshore intake and brine discharge facilities located north of the Salinas River, and offshore in Monterey Bay within MBNMS near Moss Landing Harbor and Elkhorn Slough.[8] This portion of the setting/affected environment contains a large amount of open water including ponds, flooded mudflats, Moss Landing Harbor, Old Salinas River Channel, Moro Cojo Slough, Elkhorn Slough, and Bennett Slough.

Moss Landing Harbor serves as the gateway to the Elkhorn Slough National Estuarine Research Reserve, California's second largest marine wetland administered by the National Oceanic and Atmospheric Administration (NOAA) and managed by the California Department of Fish and Wildlife (CDFW). This expansive tidal wetland is an important habitat for terrestrial and marine species. In addition to NOAA and CDFW, the Elkhorn Slough Foundation and other agencies and organizations protect natural resources and manage many conservation areas within this area, including Moss Landing State Beach, Moss Landing Wildlife Area, and Salinas River State Beach.

Aquatic habitats within MBNMS, Moss Landing Harbor, and Elkhorn Slough include tidal salt marsh, rocky intertidal, sand and gravel beaches, tidal sand and mudflats, pelagic habitat, and subtidal benthic (seafloor) habitat.

Aquatic Habitats

Tidal Salt Marsh. Elkhorn Slough's large tract of tidal salt marsh is an important avian stop along the "Pacific Flyway" migration route, and provides habitat for over 135 aquatic bird, 550 marine invertebrate, and 102 fish species. Elkhorn Slough supports more than 20,000 shorebirds annually, including the western snowy plover (*Charadrius alexandrines nivosus*), a federally threatened and state species of special concern.

Rocky Intertidal. Where artificial rocky rubble, steel and concrete bulkheads, and pilings are present throughout the Harbor and slough, the mussel *M. californianus* and *M. Trosulus* can both be found, depending on their proximity to the main channels and tidal flows of ocean water. Green algal beds of *Enteromorpha* and *Ulva*, the red algae *Mastocarpu/Gigartinas* and *Polysiphonia,* striped shore crabs (*Pachgrapsus crassipes*), mud flat crabs (*Hemigrapsus oregonensis*), barnacles (*Chtalamus and Semibalanus cariosus*), limpets (*Acmaea spp.*), turban

[8] Moss Landing Harbor is not within MBNMS. Portions of Elkhorn Slough east of Highway 1 are within MBNMS.

snails (*Tegula funebralis*), and hydroids are also present. In addition, under the rocky rubble in some areas of the Harbor, the tube-building crustacean, *Corophium*, has been observed.

Sand and Gravel Beaches. Various invertebrates live in the sand and in wracks of decaying seaweed and other detritus. These include cirolanid isopods and mole crabs (Oakden and Nybakken, 1977). Polychaete worms, bivalves (i.e., clams, mussels, and scallops) are also regularly present, though typically in lower abundances. In addition, there are numerous shorebird species that use these beaches, such as sanderlings, marbled godwits, and willets that feed at the water's edge, and western snowy plovers and California least terns, both protected species, that nest there. Marine mammals, including California sea lions, harbor seals, and elephant seals, haul-out on isolated beaches and sands spits in Moss Landing's South Harbor. Sand dollars, worms, clams, crabs, and a variety of fish, including surfperch and flatfish, live in the surf zone.

Tidal sand and mud flats. Sheltered and exposed tidal flats support diverse populations of worms dominated by *Notosmastus tenuis* as well as the fat innkeeper worm (*Urechis caupo*); clams including the bentnose clam (*Macoma nasuta* and *M. secta*), gaper clam (*Tresus nuttalli*), Washington clam (*Saxidomus nuttalli*) and littleneck clam (*Prototheca staminea*); and snails (*Tegula spp.*) and provide important foraging area for migrating and resident shorebirds. Exposed tidal flats also support several areas of eelgrass beds (*Zostera marina*) that provide important nursery habitat for juvenile fish, crabs, and shrimp, as well as many other invertebrate species. Sea otters (*Enhydra lutris*) use mudflats within Elkhorn Slough as a pupping ground (Elkhorn Slough Foundation, 2011).

Pelagic Habitat. Monterey Bay, which is within MBNMS, has a high level of phytoplankton primary production due to annual seasonal upwelling, providing the base in a food web including zooplankton, fish, and marine mammals. Fish and marine mammal species occurring in the pelagic environment in this region are largely the same as those described in Section 4.5.1 (Setting/Affected Environment for the proposed project). The close proximity of Monterey Submarine Canyon to the shoreline means that certain fish, sharks, and marine mammals that would normally be found only in deeper offshore waters are frequent inhabitants of the nearshore pelagic environment surrounding Moss Landing. Many organisms found in the nearshore coastal environment use Elkhorn Slough mid-water habitat as nursery or spawning grounds and are therefore, temporary inhabitants (Caffrey et al., 2002). Permanent residents of Elkhorn Slough's pelagic habitat include black surfperch (*Leptocottus armatus*), striped mullet (*Mugil cephalus*), and bay pipefish (*Syngnathus leptorhynchus*). Recent studies of the plankton and larval fish communities inhabiting the coastal waters adjacent to the proposed Deep Water Desal project (Alternative 3) indicate that the plankton community is dominated by calanoid copepods, cyclopod copepods, and euphausiids (AMS, 2016). The larval fish and invertebrate larvae population appears to be dominated by northern anchovy (*Engraulis mordax*), white croaker (*Genyonemus lineatus*), gobies, assorted unidentified larval fish, the bay goby (*Lepidogobius lepidus*), sanddabs (Citharichthys spp.), lanternfishes, the blue rockfish complex (Sebastes), smelts, Pacific Sardines (*Sardinops sagax*), Dungeness crab (*Metacarcinus magister*), assorted cancer crabs, and market squid (*Doryteuthis opalescens*) (Tenera Environmental, 2014). Krill, a major prey item for many cetaceans, also are found in high concentrations along canyon walls and near canyon heads.

Subtidal Benthic (Seafloor) Habitat. The submarine canyon walls are a mixture of soft substrate and rocky outcrops, providing subtidal habitat for a very diverse biota of benthic organisms, such as corals, sea pens, tunicates, sponges, crinoids, and fishes. Species primarily associated with the freshwater areas of Elkhorn Slough include American shad (*Alosa sapidissima*), threadfin shad (*Dorosoma petenense*), mosquitofish (*Gambusia affinis*), prickly sculpin (*Cottus asper*), and threespine stickleback (*Gasterosteus aculeatus*). Few non-native species have been observed but do include the yellowfin goby (*Acanthogobius flavimanus*), mosquitofish, American shad, and striped bass. Within the Elkhorn Slough, the only permanent benthic resident is the Pacific staghorn sculpin (*Leptocottus armatus*). Other species occurring in the subtidal habitat within the slough are largely the same as those described in Section 4.5.1 (Setting/Affected Environment for the proposed project).

Special-Status Marine Species and Marine Natural Communities

The region assessed as part of the alternatives analysis includes USFWS-designated critical habitat areas for tidewater goby (*Eucyclogobius newberryi*), western snowy plover (*Charadrius alexandrinus nivosus*), and steelhead (*Oncorhynchus mykiss*), each of which is described in **Table 4.5-2** in Section 4.5. Specific to the alternative study area, tidewater goby is known to occur in Bennett Slough and Moro Cojo Slough (CNDDB, 2010), both of which are part of Elkhorn Slough. Furthermore, Bennett Slough has been federally designated as a critical habitat recovery unit (MNT-1) for the species (USFWS, 2014). Threats to the recovery of the tidewater Goby include: 1) coastal development projects that result in the loss or alteration of coastal wetland habitat; 2) water diversions, alterations of water flow, and groundwater overdraft upstream of coastal lagoons and estuaries that negatively impact the species' breeding and foraging activities; 3) channelization of habitats, and; 4) nonpoint- and point-source pollution or discharge of agricultural and sewage effluents that are likely to impact the species' health or breeding and foraging activities.

Of the three listed salmonid species that occur in the waters of Monterey Bay (Coho salmon, Chinook salmon, and steelhead), only the Chinook salmon are known to occur within Elkhorn Slough. Chinook salmon of unknown origin have been recorded occasionally occurring in Elkhorn Slough (Yoklavich et al., 2002; Tenera Environmental, 2007), although no known critical habitat or access to spawning grounds is known to be present.

Elkhorn Slough, as well as protected habitat areas (e.g., Salinas River State Beach, Moss Landing State Beach, Moss Landing Wildlife Area, conservation lands managed by the Elkhorn Slough Foundation), support numerous special-status species of marine mammals, birds, turtles, and fish. In addition to these species, southern sea otter is a frequent inhabitant within Elkhorn Slough, which is used as both a foraging and a pupping ground. Southern sea otters inhabit open water and haul out on the mudflats in the main slough channel, from Moss Landing Harbor to Hudson Landing, but they are most common in the North Harbor area.

Additional natural communities present in the alternatives study area and not discussed in Section 4.5 include eelgrass and Native Olympia Oysters (*Ostrea lurida*). Eelgrass is a native marine vascular plant that has been afforded special management considerations by CDFW, USFWS, NMFS, and USEPA. Major eelgrass beds exist along the main slough channel east of

Highway 1 and at Seal Bend. In addition to providing refugia for young fish and invertebrates and foraging areas for waterfowl, eelgrass beds stabilize shorelines by dampening wave energy, collecting sediments transported to the shore, and preventing shore erosion. They also improve water quality by collecting and filtering organic matter and suspended sediment. In Elkhorn Slough, eelgrass is threatened by high erosion rates in the main channel; dredging in its historical Moss Landing harbor location; and light limitation caused by turbid water, eutrophication, and high abundance of algae (Elkhorn Slough Foundation, 2016).

Olympia oysters are a sensitive natural community known to provide high biodiversity habitat because they provide physical habitat structure sought by juvenile fish and crustaceans, worms, and foraging fish and birds (NOAA, 2008). They also stabilize sediment, reduce suspended sediment, and improve light penetration, thereby improving the physical conditions that encourage the establishment of submerged aquatic vegetation, such as eelgrass beds. Additionally, a robust population of filter feeders can help modulate plankton blooms (NOAA, 2008). Naturally occurring populations of native oysters within the Elkhorn Slough are extremely rare in most parts of the estuary, including areas where it once thrived. Threats to Olympia oysters include predation from indigenous and non-native marine snails (*Acanthina spirata* and *Urosalpinx cinerea*, respectively), birds, bat rays, and crabs. Limited suitable hard substrate and physical water quality conditions are also important parameters (NOAA, 2008).

5.5.5.2 Direct and Indirect Effects of the Proposed Project (10 slant wells at CEMEX)

As described in detail in Chapter 3, Description of the Proposed Project, the proposed project (see **Figure 3-2**) would include construction of a desalination plant on Charles Benson Road, up to nine new subsurface slant wells at the CEMEX active mining area and conversion of the existing test slant well to a permanent well, and the discharge of brine through the existing wastewater outfall. The proposed project would also include improvements to the existing Seaside Groundwater Basin aquifer storage and recovery (ASR) system, and about 21 miles of new water conveyance pipelines. No construction or placement of facilities on the seafloor would occur. Accordingly, drilling of the slant wells is the only construction activity that is considered; the operational activities include the pumping of the slant wells and the discharge of brine.

The following paragraphs summarize the direct and indirect effects of the proposed project and some of the impact categories are grouped; for a more detailed analysis and discussion, refer to Section 4.3.5. Overall, the effect of the proposed project on marine biological resource would be less than significant.

Construction Impacts

The subsurface slant wells are the only project components that would involve construction in or near the study area. Since none of the other project facilities would require construction in the study area, construction of the other project facilities would not directly or indirectly affect marine biological resources.

Impact 4.5.1: Have a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH)); or as identified by the CDFW, USFWS, or NMFS during construction.

Impact 4.5.2: Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels during construction.

Impact 4.5.3: Interfere substantially with the movement of any native resident or migratory fish or marine wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native marine wildlife nursery sites during construction.

Underwater noise associated with drilling during well construction activities, the potential accidental release of drilling fluid, and the possible discharge of clarified[9] groundwater recovered during drilling operations are the only construction activities that could potentially affect marine biological resources and habitats.

Any drilling noise reaching overlying ocean waters would be below background underwater noise levels as a result of attenuation through the seafloor; underwater noise generated during slant well drilling would have no impact during construction.

Because the drilling operation would be set back approximately 900 feet from the mean high water mark (MHW) on the shoreline and the construction contractor would manage drilling fluids and potential discharges of clarified groundwater in accordance with regulatory requirements, the potential for an accidental release of any hazardous drilling fluids into waters of MBNMS, or increased turbidity in Monterey Bay during slant well construction, would be less than significant (see Section 4.3.5.1 for details). Because construction would not directly disturb marine habitat or cause stress, mortality, or behavioral avoidance as a result of construction noise or water quality degradation, the construction of the proposed project would not have a substantial adverse effect on any marine biological resources in MBNMS including special-status species, would not cause a fish or marine wildlife population to drop below self-sustaining levels and would not interfere with the movement of any native marine resident or migratory fish or marine wildlife species in MBNMS; the impact would be less than significant. No impacts would occur from the construction of any other proposed facility because none occur within the marine biological resources study area.

Operation Impacts

Potential operational impacts on marine biological resources would be limited to adverse effects associated with operation of the subsurface slant wells and the discharge of brine generated at the proposed MPWSP desalination plant. Because none of the other project facilities would affect marine biological resources, none of the other facilities are discussed.

9 Clarified Water: Water that has been processed to remove suspended sediments and is therefore "clear" and when discharged to the ocean will not result in increased turbidity.

Impact 4.5-4: Result in a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any marine species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH); or as identified by the CDFW, USFWS, and/or NMFS during operations.

Impact 4.5-5: Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels during operations.

Impact 4.5-6: Interfere substantially with the movement of any native marine resident or migratory fish or marine wildlife species or with established native resident or migratory marine wildlife corridors, or impede the use of native marine wildlife nursery sites during operations.

Impacts on marine biological resources during operations could result from impingement of organisms or through the accumulation of fine particulate material on the seafloor during pumping of the slant wells, from elevated salinity or other constituents in the brine, or from shear stress[10] on plankton from discharged brine.

Impingement of plankton, aquatic species eggs, larval fish and other organic matter on the seafloor or a potential deterioration of seafloor sediments and soft substrate benthic habitat from the operation of the slant wells is not likely because the ocean currents at the seafloor and swimming speeds of aquatic species are greater than the low intake velocity. Furthermore, because squid spawning typically occurs on sand and mud seafloor habitats at depths greater than the intertidal zone where slant wells would be located, potential impacts on market squid eggs from slant well pumping would also not likely occur.

The increased salinity in the brine discharge would meet Ocean Plan water quality objectives at the edge of the BMZ (see Section 4.3.5.2 for details) and would not affect marine habitat by reducing dissolved oxygen content (hypoxia). The model-based analyses of water quality constituent concentrations, mixing, and dilution at the outfall diffuser for all operational scenarios concluded constituent concentrations would become elevated to levels greater than 80 percent of the Ocean Plan water quality objectives for ammonia, and cyanide at the edge of the ZID. For an additional thirteen constituents, there is not enough information to assess concentrations at the edge of the ZID due to differences in MRLs used to assess the source waters or due to MRLs being higher than Ocean Plan objectives (see Section 5.5.3). Therefore, it is conservatively concluded that Ocean Plan water quality objectives could potentially be exceeded during operations for some operational discharge scenarios, resulting in a significant impact. As discussed in Section 4.3, Surface Water Hydrology and Water Quality, significant impacts would be reduced to a less-than-significant level by implementing **Mitigation Measures 4.3-4** and **4.3-5**, which would ensure that monitoring is conducted to confirm that the brine is discharged at concentrations below Ocean Plan water quality objectives and further ensure compliance with the

[10] Shear stress is a strain in the structure of a substance produced by pressure, when its layers are laterally shifted in relation to each other.

monitoring requirements and regulatory standards that are protective of the beneficial uses (including aquatic wildlife and habitat) of Monterey Bay. In the event that monitoring reveals non-compliance with Ocean Plan water quality objectives, corrective actions would be implemented (through implementation of **Mitigation Measure 4.3-5**) that would ensure operational discharges adhere to regulatory standards that are protective of beneficial uses.

Impacts due to shear stress caused by the brine discharge would be limited to plankton, because motile organisms would be able to avoid turbulence in the immediate vicinity of the brine discharge. The impact on plankton from shear stress would be less than significant because of the small percentage of plankton abundances potentially affected in the context of plankton abundance in the study area. Moreover, the Ocean Plan (OP) Provisions for Desalination Facilities require modeling and estimating of potential mortality due to shear stress entrainment, and require periodic re-evaluation to ensure the operational procedures employed result in acceptable plankton mortality (SWRCB, 2016). Ongoing evaluations and analysis, as required by the OP, will ensure that plankton losses remain less than significant, even if influencing factors related to plankton or the potential for plankton loss (plankton abundance, ocean conditions, etc.) fluctuate in the future, as is typical for such a dynamic environment.

Therefore, the operation of the proposed project would not have a substantial adverse effect on any marine biological resources in MBNMS including special-status species, would not cause a fish or marine wildlife population to drop below self-sustaining levels and would not interfere with the movement of any native marine resident or migratory fish or marine wildlife species in MBNMS; the impact would be less than significant. Because there is little risk that benthic infauna and macrofauna populations would decline due to impingement, shear stress, and increased salinity, impacts are not anticipated on fish, marine mammals (such as the Southern sea otter and California gray whale), seabirds, and other species. Transfer of bioaccumulated contaminants from benthic infauna to higher trophic levels also would be limited by the very small area of seafloor potentially affected. Transfer to predators in higher trophic levels would be proportional (e.g., very limited) to the relative consumption of prey from within and outside of the affected seafloor area. Therefore, the indirect impacts on fish, marine mammals, sea birds, and other species are also determined to be less than significant.

Cumulative Impacts

Impact 4.5-C: Cumulative impacts on marine biological resources. (*Less than Significant*)

The geographic scope for the cumulative analysis of impacts on marine biological resources encompasses the nearshore waters (within 5 miles from shore) of Monterey Bay and extends from north of Moss Landing Harbor southward to the northern limits of Sand City, including the subtidal and intertidal habitats contained therein, and all marine biological communities.

The proposed MPWSP would use subsurface slant wells in-lieu of an open ocean intake. As a result, there are no anticipated or proposed construction activities within the coastal waters of the MPWSP project area that are expected to result in disturbance or effects on marine biological resources. Because any drilling noise reaching ocean waters overlying the slant wells is expected to be below background underwater noise levels, the lack of noise generated by slant well drilling could not combine with other sources of underwater noise generated by projects in the cumulative scenario to result in increased noise above ambient levels. The Deepwater Desal project would also involve offshore construction, but the Deepwater Desal intake and discharge facilities would be constructed approximately 6.5 miles to the north, and possibly years later than the MPWSP; therefore, noise would not accumulate with the proposed project's construction noise.

While Deepwater Desal is expected to have a high impingement risk due to its open water intake design, the MPWSP's impingement risk is low and is not likely to incrementally increase the impingement risks caused by Deepwater Desal. Therefore, the MPWSP could not contribute to any cumulative impacts related to the impingement or entrainment of fish or invertebrate species, or the impingement of fine organic matter.

The MPWSP and the DeepWater Desal project would discharge a brine solution with an elevated salinity concentration as well as potentially elevated concentrations of contaminants to the ocean through the existing MRWPCA ocean outfall. The distance between the DeepWater Desal proposed outfall and the existing outfall proposed for use by the MPWSP (i.e., 31,511 feet; 9,605 meters; 5.96 miles) leads to the determination that there is no expectation of the two BMZs reaching each other or intermixing discharge waters. The area within the BMZ for the MPWSP that could exceed 2 ppt is estimated at a total volume of approximately 31 cubic meters (1,100 cubic feet) of pelagic habitat and associated marine taxa, including special status fish, invertebrate, and marine mammal species. Since the DeepWater Desal project proposes to discharge more brine than the MPWSP, its BMZ would be larger than that of the MPWSP. Depending on operating conditions, the DeepWater Desal project could result in approximately 150 to 1,500 cubic meters (5,300 to 53,000 cubic feet) of pelagic habitat exceeding 2 ppt around the diffuser structure. Based on the comparative scale of the volume of pelagic habitat that could exceed 2 ppt salinity as compared to the nearshore pelagic habitat available in Monterey Bay, there would be no significant cumulative impacts in Monterey Bay regardless of other external stressors. Therefore, the cumulative effect of the two projects from increased salinity concentrations in their brine discharges on marine biological resources, including special status fish, invertebrates, and marine mammal species, would be less than significant.

However, the proposed MPWSP discharge could be out of compliance with the Ocean Plan for cyanide and ammonia and, for an additional thirteen constituents, there is not enough information to assess concentrations at the edge of the ZID. The implementation of **Mitigation Measure 4.3-4 (Operational Discharge Monitoring, Analysis, Reporting, and Compliance)** would ensure that brine constituents from the MPWSP, such as cyanide and ammonia, are discharged at concentrations below Ocean Plan requirements and would result in a less than significant contribution to a cumulative impact related to cyanide and ammonia. The constitution of the brine that would be discharged from the DeepWater Desal project is currently unknown but this analysis assumes that, at a minimum, contaminants detected in the ocean water (CCLEAN, 2015) that currently exceed Ocean Plan water quality objectives (PCBs) would in all likelihood also exceed Ocean Plan water quality objectives at the edge of the DeepWater Desal ZID. If there are no operational actions available for dilution of the brine from the DeepWater Desal project, or feasible mitigation actions to reduce potential increased PCB concentrations, and therein reduce the potential impact on pelagic marine biological resources, then the potential impact on marine biological resources inhabiting pelagic habitat within the ZID of the DeepWater Desal project would be significant and unavoidable.

The DeepWater Desal project would have to implement operational actions that ensure its brine discharges also achieve the Ocean Plan water quality objectives. Since the MPWSP would be using subsurface intakes, the PCBs drawn into the source water through the ocean floor would be less than ambient ocean water and would not exceed Ocean Plan objectives at the edge of the ZID. Thus, the MPWSP would have a less than significant contribution to a cumulative impact related to PCB concentrations.

As discussed in Impact 4.5-4, impacts on marine organisms caused by shear stress from the proposed project would be concentrated on plankton smaller than 1.0 mm and would be less than significant (0.00261 percent of nearshore planktonic organisms killed). At present, only a preliminary assessment of potential shear stress impacts on planktonic organisms has been performed for the DeepWater Desal project. However, the assessment of potential brine discharge effects on planktonic organisms relative to the volume of the MPWSP brine discharge (Impact 4.5-4) can be used as a basis for estimating similar impacts from the DeepWater Desal project. If the MPWSP and DeepWater Desal were both built and operated, DeepWater Desal is estimated to have a brine discharge of approximately 27 mgd, in comparison to the MPWSP’s 14 mgd brine discharge. Assuming that the DeepWater Desal diffuser jets would cause no greater shear impact than the diffusers used on the MRWPCA outfall, DeepWater Desal brine discharges are estimated to cause plankton mortality rates of approximately 447 million individuals per day, assuming plankton densities similar to those measured at the MRWPCA outfall (see Table 4.5-1). As a result, the estimated potential cumulative effect of brine discharge shear stress on planktonic organisms less than 1 mm in size would be approximately 3.8 billion planktonic organisms per day or 0.011 percent of the potential nearshore plankton in Monterey Bay, a small fraction of the plankton less than 1 mm in size inhabiting the nearshore waters near the ocean outfalls. Additionally, the Ocean Plan water quality objectives for brine discharges require modeling and estimating of potential mortality due to shear stress entrainment and require periodic re-evaluation to ensure the operational procedures employed result in acceptable plankton mortality (SWRCB, 2016). No significant cumulative impact from brine discharge shear stress would occur as a result of the MPWSP and DeepWater Desal project.

5.5.5.3 Direct and Indirect Effects of the No Project Alternative

Under the No Project Alternative, no desalination facility would be built and operated, no slant wells would be drilled, the test slant well would be decommissioned and no brine would be discharged through the MRWPCA outfall. Therefore, there would be no impacts on marine habitats and taxa as a result of construction activities or operational discharges. There would be beneficial impacts on steelhead under the No Project Alternative while they are present in terrestrial habitat, due to reductions in withdrawals from the Carmel River. For more information, see Section 5.5.6.3. Because the No Project Alternative would have no other direct or indirect impacts with respect to marine biological resources, it could not contribute to cumulative effects.

5.5.5.4 Direct and Indirect Effects of Project Alternative 1 – Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.4.3). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road is the only component unique to Alternative 1 (see **Figure 5.4-1**) that could affect marine biological resources; brine would be discharged through the existing outfall just like the proposed project. Therefore, the marine biological resources impact analysis of Alternative 1 focuses primarily on the effects of the intake system; however, impact conclusions are made for the whole of Alternative 1.

Construction Impacts

The component unique to Alternative 1 that would involve construction in or near the marine resources study area would be the subsurface slant wells at Potrero Road. Just like the proposed project, underwater noise from the drilling operation would be below background underwater noise levels due to attenuation through the seafloor. Slant well drilling activities would occur in the parking lot approximately 600 feet inland from MHW on the back side of the dunes, and the contractor would discharge drilling liquids in accordance with regulatory requirements (see Section 5.5.3 for analysis of construction related water quality impacts). Although the potential impact would be increased from the proposed project because of the additional slant well at Potrero Road, the construction of Alternative 1 would not have a substantial adverse effect on any marine biological resources in MBNMS including special-status species, would not cause a fish or marine wildlife population to drop below self-sustaining levels and would not interfere with the movement of any native marine resident or migratory fish or marine wildlife species in MBNMS. Therefore, Alternative 1 would result in the ***same impact conclusions*** as the proposed project, less than significant.

Operational and Facility Siting Impacts

Unlike the proposed project, groundwater modeling (see **Appendix E2**) indicates pumping from the slant wells at Potrero Road would result in a cone of depression in the underlying groundwater aquifers that would draw or divert water from Elkhorn Slough. This drawdown impact is discussed in Section 5.5.4, Groundwater Resources, and presented in **Figure 5.5-2**. The modeling cannot predict the amount of water diverted from Elkhorn Slough although it must be conservatively assumed, based on the predicted areal extent of the drawdown, that operations could potentially adversely affect aquatic habitat in Elkhorn Slough due to reduced surface water flow and volumes. This would be an increased level of impact compared to the proposed project and because there is no method to mitigate for impacts on surface water flow and volumes in Elkhorn Slough, Alternative 1 would result in an ***increased impact conclusion*** on marine species, natural communities or habitat, protected wetlands or waters, and critical habitats compared to the proposed project, significant and unavoidable.

As described for the proposed project, impingement of plankton, larval fish and other organic matter on the seafloor from the operation of the slant wells at Potrero Road would not occur because ocean currents at the seafloor are greater than the low intake velocities from the slant wells, the increased salinity and other constituents in the brine discharge (see Section 5.5.3) would not threaten to eliminate a marine plant or animal wildlife community or cause a marine population to drop below self-sustaining levels, and would not interfere with the movement of native resident or migratory fish or marine wildlife species. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant.

The brine would be discharged at the same location and at the same concentration as the proposed project (see Section 4.5 for details). Therefore, operational discharge impacts on marine biological resources would be the same as the proposed project, less than significant with implementation of **Mitigation Measures 4.3-4** and **4.3-5**.

In summary, the operation of Alternative 1 would have a greater potential impact on marine biological resources compared to the proposed project. While the operation of Alternative 1 would not cause a fish or marine wildlife population to drop below self-sustaining levels and would not interfere with the movement of any native marine resident or migratory fish or marine wildlife species in MBNMS, Alternative 1 could cause potentially significant and unavoidable effects on marine species, natural communities or habitat, protected wetlands or waters, and critical habitats in Elkhorn Slough as a result of the groundwater elevation drawdown from project pumping at Potrero Road.

Cumulative Analysis

Cumulative impacts during construction would be the same as those described for the proposed project in Section 4.5.6; the location of the slant wells at Potrero Road and the additional duration associated with construction of one additional slant well would not change the applicable geographic scope of the analysis or the type or intensity of Alternative 1's contributions to cumulative impacts during construction, which would be less than significant.

During operations, the impacts associated with seawater intake and brine discharge would be the same as those described for the proposed project in Section 4.5.6. Although the additional impact of Alternative 1 on surface water flow and volumes in Elkhorn Slough would be significant and unavoidable, as discussed in Section 5.5.4.3 regarding groundwater impacts, no other projects are located in the same geographic area and have the potential to affect groundwater resources in the Perched A Aquifer, which in turn could result in impacts on surface water in Elkhorn Slough. Because no other projects would affect surface water flows and volumes in Elkhorn Slough, a cumulative impact analysis is not relevant to this impact.

5.5.5.5 Direct and Indirect Effects of Project Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to Castroville Community Services District would not be implemented.

Therefore, the open water intake system is the unique component of Alternative 2 (see **Figure 5.4-2**) that could affect marine biological resources and this impact analysis focuses primarily on the potential impacts of construction and operation of the intake system; however, impact conclusions are made for the whole of Alternative 2.

Construction Impacts

The construction of an open-water intake, including the placement of the intake structure on the seafloor and the installation of the intake pipeline at the breakout face where the pipeline emerges from the seafloor, would result in a temporary localized disturbance of seafloor habitat, associated marine infaunal and epifaunal community, and habitat function that could have a temporary effect on some special-status fish species. The construction barges and drilling methods employed in installing the pipeline itself would pose temporary obstructions (anchor chains) to the movement of marine mammals and sea turtles, temporary disturbance and possible loss of soft substrate habitat and habitat function for special-status fish and marine mammal species under temporary barge anchors, and increased underwater noise from the construction activities. These activities could cause altered behavior (altered foraging and swimming patterns) in some special status fish, marine mammals, and sea turtles. The possible use of barges from outside Monterey Bay could pose a risk of introducing non-native invasive species attached to their hulls or in their ballast water which could indirectly affect marine community composition and habitat function in Monterey Bay.

These potential impacts would be considered significant and substantially more severe than construction impacts of the proposed project. **Mitigation Measure ALT 2-Marine-1** would require actions to avoid or minimize construction impacts on marine biological resources. While these measures would reduce construction-related impacts on marine biological resources, residual impacts may remain significant due to the sensitivity of the resources. Therefore, the construction of Alternative 2 could result in an increased impact on marine biological resources including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans during construction and would result in an ***increased impact conclusion*** compared to the proposed project; significant and unavoidable even with implementation of **Mitigation Measure ALT 2-Marine 1**.

While Alternative 2 would have an increased impact on marine biological resources compared to the proposed project because of the in-water construction described above, Alternative 2 would not cause a fish or marine wildlife population to drop below self-sustaining levels and would not interfere with the movement of any native marine resident or migratory fish or marine wildlife species in MBNMS. For these potential effects, Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant. No impacts would occur from the construction of any other proposed facility because none occur within the marine biological resources study area.

Mitigation Measure ALT 2-Marine-1 applies to the Alternatives 2, 3, and 4 (alternatives with open-water intakes) and would not apply to the proposed project or Alternatives 1, 5a, or 5b.

Mitigation Measure ALT 2-Marine-1: Marine Construction Measures.

CalAm and/or its contractors shall implement avoidance and minimization measures including, but not limited to:

1. Limit marine construction activities to periods of the year in which marine mammals and sea turtles are not migrating through the area;
2. Prior to construction, conduct seafloor habitat surveys of potential anchor chain corridors to determine locations of sensitive habitats, such as hard bottom substrate habitat, and avoid siting anchor chain corridors within these sensitive habitats;
3. The hulls of non-local work vessels and barges shall be cleaned prior to commencing work in Monterey Bay;
4. On-board qualified marine mammal observers (as defined by NOAA Fisheries) shall be present during all offshore construction activities with a requirement to cease all work if marine mammals or turtles come within 50 yards from the work vessels, and;
5. Provide environmental training to all marine work crews prior to start of construction to prevent environmental incidents. Training shall include information about how to identify marine biological resources to be avoided during construction, protocols for reporting to marine mammal observers, the importance of avoiding impacts on marine biological resources, and measures to avoid or minimize impacts during construction.

In summary, the construction of Alternative 2 would have a greater potential impact on marine biological resources compared to the proposed project because of the in-water construction activities. While the construction of Alternative 2 would not cause a fish or marine wildlife population to drop below self-sustaining levels and would not interfere with the movement of any native marine resident or migratory fish or marine wildlife species in MBNMS, Alternative 2 could result in potentially significant and unavoidable effects on marine species, natural communities or habitat, protected wetlands or waters in Monterey Bay within MBNMS as a result of residual impacts from in-water construction activities.

Operational and Facility Siting Impacts

Alternative 2 would include a screened open water intake within MBNMS that would be anchored to the seafloor and would result in a permanent loss of approximately 3,300 ft^2 of soft substrate benthic habitat, affecting marine species dependent on this habitat and habitat function. This would result in a greater impact compared to the proposed project, which proposes subsurface slant wells and no new structures on the seafloor.

Additionally, the same volume of source water as the proposed project would be provided by a screened open water intake. Consistent with the requirements of the Ocean Plan (SWRCB, 2016), the passive narrow-slot wedgewire screens would have a 1-millimeter (mm) slot size, and the screened intake water velocity would be at or below 0.5 feet per second. Although the screen design and operating intake velocity would be consistent with the requirements of the Ocean Plan, Alternative 2 could still result in an increased long-term impact on pelagic planktonic organisms and community through impingement and entrainment. Direct impingement of larger fish and invertebrate organisms is not expected due to the wedgewire screens and the low flow rate. However, as shown in **Table 4.5-8** in Section 4.5, the swimming speeds of several species of plankton, larval invertebrates, and larval fish are below the 0.5 feet per second intake velocity; therefore, such organisms could be entrained. Operation of Alternative 2 would result in 100 percent mortality of all organisms entrained through the open-water intake. A preliminary baseline characterization of the habitat in the vicinity of the Alternative 2 intake indicates that larval northern anchovy, Pacific sardines, white croaker, sanddab, rockfish, smelt, sculpin, Dungeness crab, cancer crabs, and unidentified larval fish are present and could be entrained (Tenera Environmental, 2014).

The Ocean Plan requires mitigation for loss of marine life or habitat due to the operation of an open ocean intake. Such loss is assessed through the conversion of Empirical Transport Modeling (ETM) results into an estimate of the habitat necessary to replace the production lost due to entrainment, called the Area of Production Foregone (APF). The APF is calculated by multiplying the area of habitat present within the estimated source water that would be drawn into the intake, by the proportional entrainment mortality estimated from ETM, to provide a habitat acreage that may be useful for understanding the extent of compensation required to mitigate impacts from entrainment (SWRCB, 2016). Potential APF for the magnitude of the loss under Alternative 2 was estimated (Luster, 2016) at less than 20 acres and therefore, potential operational impacts would be substantially greater than the proposed project and would be significant, with mitigation required per the Ocean Plan. **Mitigation Measure ALT 2-Marine-2** would be required to minimize and mitigate for impacts on marine biological resources from entrainment. While these measures would minimize impacts on marine biological resources, residual impacts may remain significant due to the uncertainty of the efficacy of the mitigation.

Furthermore, Alternative 2 would use the existing MRWPCA outfall and would generate the same volume of brine discharge, with the same salinity characteristics, as the proposed project (see Section 4.5 for details). Unlike the proposed project however, the open water intake would not pre-filter PCBs through the seafloor and the resultant concentration of PCB in the brine would be greater than the proposed project and Alternative 2 could potentially exceed the Ocean Plan water quality objective for PCBs at the edge of the ZID. As described for the proposed project, because other Ocean Plan-regulated constituent concentrations (ammonia and cyanide) could become elevated under certain discharge scenarios, and because there is not enough information to assess concentrations for an additional thirteen constituents at the edge of the ZID, it is conservatively concluded that Ocean Plan water quality objectives could potentially be exceeded during operations for some operational discharge scenarios, resulting in a significant impact. Similar to the Proposed Project (see Section 5.5.3 for water quality analysis related to operational discharges under Alternative 2), Alternative 2 would be subject to the same mitigation as defined for the proposed project, which requires development and approval of a monitoring and reporting plan, consistent with the requirements of the Ocean Plan and MBNMS guidelines, prior to construction and operation. **Mitigation Measure 4.3-4** (**Operational Discharge Monitoring, Analysis, Reporting, and Compliance**) would ensure compliance with the monitoring requirements and regulatory salinity standards that are protective of the beneficial uses (including aquatic wildlife and habitat) of Monterey Bay. The monitoring and reporting plan would set forth appropriate response thresholds as well as corrective actions (defined in **Mitigation Measure 4.3-5**) that would be required if the acquired data indicated deleterious effects on receiving water quality or marine resources from discharges. Implementation of **Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives)** would reduce the potentially significant impact to a less-than-significant level. Overall, considering loss of benthic habitat, impingement/entrainment, and brine discharge effects, the operation of Alternative 2 would result in a greater impact on marine species, natural community, or habitat, during operations and an ***increased impact conclusion*** compared to the proposed project; impacts would be significant and unavoidable even with implementation of **Mitigation Measure ALT 2-Marine 2, Mitigation Measure 4.3-4** (**Operational Discharge Monitoring, Analysis, Reporting, and Compliance**), and **Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives)**.

At present, there are no known marine species in Monterey Bay with population numbers suspected of dropping below self-sustaining levels with the exception of the California sea otter. Although sea otters feed within the study area, sea otter prey would not be reduced and other species would not be expected to be reduced in number because of entrainment of juvenile larvae and plankton. For the past several decades, the Moss Landing Power Plant has been using approximately 1.2 billion gallons per day of ocean water to cool power plant turbines (Tetra Tech, 2008). The entrainment of larval fish and plankton at the Moss Landing Power Plant has not resulted in effects on local marine species such that populations have been substantially affected. Therefore, the potential would be increased compared to the proposed project for the open-water intake to directly or indirectly threaten a marine plant, animal or wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels or interfere with the movement of any native marine resident or migratory fish or marine wildlife species in MBNMS but would result in the ***same impact conclusion*** as the proposed project, less than significant.

Mitigation Measure ALT 2-Marine-2 applies to the Alternatives 2, 3, and 4 (alternatives with open-water intakes) and would not apply to the proposed project or Alternatives 1, 5a, or 5b.

Mitigation Measure ALT 2-Marine-2: Minimization of and Mitigation for Loss of Marine Life and Habitat.

To ensure that design and operation of the Alternative 2 open ocean intake complies with the requirements of the California Ocean Plan, CalAm and/or its contractors shall:

1. In addition to implementing the required design standard of screening the open ocean intake using a screen with a 1.0-millimeter or smaller slot size screen, and the required operational standard of limiting through-screen velocity at the intake to not exceed 0.15 meters per second (0.5 feet per second), implement the best available technology

feasible to minimize intake and mortality of all forms of marine life in the context of design and operation of an open ocean intake. Submit design of the open ocean intake to the RWQCB, CPUC, and MBNMS for review and approval.

2. Prepare a Marine Life Mortality Report to estimate the marine life mortality resulting from construction and operation of the facility after implementation of the facility's required site, design, and technology measures. The report shall use the methods specified in chapter III.M.2.e.(1) of the Ocean Plan, including using the Empirical Transport Model (ETM)/Area of Production Forgone (APF) approach to estimate entrainment impacts. Submit the draft report to RWQCB, CPUC, and MBNMS with the item 1 design submittal, for review and approval.

3. Based on the results of the report prepared in item 2, implement measures to meet the Ocean Plan fully mitigated standard of replacement of all forms of marine life or habitat lost. This can be accomplished in one of the following two ways or as a combination of both:

   a. *Mitigation Project*: Implement a mitigation project satisfying the provisions listed in Ocean Plan chapter III.M.2.e.(3), including preparing and submitting a Mitigation Plan as described in subsection (a) and meeting the requirements of subsection (b). Submit the Mitigation Plan to RWQCB, CPUC, and MBNMS for review and approval.

   b. *Fee-Based Mitigation Program*: If the RWQCB determines that an appropriate fee-based mitigation program has been established by a public agency, and that payment of a fee to the mitigation program will result in the creation and ongoing implementation of a mitigation project that meets the requirements of Ocean Plan chapter III.M.2.e.(3), CalAm may pay a fee to the mitigation program in lieu of completing a mitigation project. If implementation of this option is feasible, CalAm shall adhere to the requirements of chapter III.M.2.e.(4).

   For either of the above options, CalAm shall ensure that the requirements of Ocean Plan chapter III.M.2.e.(5 and 6) are met regarding site inspections of mitigation projects and mitigation project performance reporting.

In addition to physical impacts, Alternative 2 may be inconsistent with MBNMS Desalination Guidelines (NOAA, 2010), with regard to its open water intake. Guidelines state that "all desalination plants should be designed and sited to avoid and minimize impingement and entrainment to the extent feasible. Project proponents should investigate the feasibility of using subsurface intakes as an alternative to traditional intake methods."

Cumulative Analysis

The geographic scope for the cumulative analysis of the components of Alternative 2 that differ from the proposed project (i.e., the proposed open water intake) includes Monterey Bay, which is within MBNMS. The only project relevant to the cumulative scenario for Alternative 2 is the DeepWater Desal project (No. 34), described in **Table 4.1-2** in Section 4.1. The proximity of the DeepWater Desal Project to the Monterey Canyon increases the potential risk to different fish and marine mammal species.

Assuming both Alternative 2 and the DeepWater Desal project are implemented, each with their proposed open water intakes, the construction of both Alternative 2 and the DeepWater Desal Project would increase the temporary disturbance to marine soft substrate habitats, and increase disturbances to marine mammal and sea turtle movements from work barge anchors, anchor cables and underwater noise. Additionally, the increased magnitude of the marine construction effort required for DeepWater Desal would increase the risk of introducing non-native invasive species from work barges that originate from outside Monterey Bay. As described above, these impacts can be reduced through implementation of mitigation such as **Mitigation Measure ALT 2-Marine-1**; however, it is assumed that residual impacts may remain significant due to the sensitivity of the resources. Therefore, the cumulative impact from construction of Alternative 2 and the DeepWater Desal Project would be significant and unavoidable and Alternative 2 would have a cumulatively significant contribution to this impact, even with implementation of mitigation.

Alternative 2 and the DeepWater Desal Project would result in the combined permanent loss of approximately 20,000 ft^2 (about 0.5 acre) of benthic habitat. Additionally, the operation of the open-water intake would result in the entrainment of plankton and larval fish, including those of the DeepWater Desal Project (APF of greater than 40 acres), resulting in a cumulative APF estimated at approximately 60 acres (Luster, 2016). However, the existing Moss Landing Power Plant continues to draw 1.2 billion gallons per day for cooling water, which also results in the entrainment of larval fish and plankton. Through a settlement agreement executed on October 9, 2014 between the SWRCB and the current owner of the power plant, the Moss Landing Power Plant must reduce its intake of cooling water to meet an 83.7 percent or greater reduction in mortality from entrainment and impingement impacts beginning with reductions on December 31, 2016 and achieving full compliance by December 31, 2020. The Moss Landing Power Plant owner has indicated its intention to retrofit the power plant's four generating units to reduce entrainment and impingement impacts in compliance with the Once-Through-Cooling (OTC) policy and this would likely occur prior to the operation of any desalination project in Moss Landing. Regardless, the retrofit of the power plant would not offset the adverse cumulative impact attributable to entrainment and impingement at the screened open water intake component of Alternative 2, and these potential losses are considered a significant cumulative impact. As stated above, mitigation such as **Mitigation Measure ALT 2-Marine-2** would be necessary to compensate for the loss of habitat, but the efficacy of the available mitigation options has not been tested. Therefore, Alternative 2 could still result in a cumulatively significant contribution and the cumulative impacts would be significant and unavoidable.

Because the open water intake would not pre-filter the PCBs through the seafloor, the PCB levels in the brine discharge could result in exceedances of Ocean Plan water quality objectives. For the same reasons described for exceedances of salinity objectives in Section 4.5.6, this would result in a cumulatively significant impact related to PCB concentrations. However, implementation of **Mitigation Measure 4.3-5** would reduce the concentration of PCBs in brine discharge to a level that meets Ocean Plan water quality objectives and is therefore less than significant with mitigation.

5.5.5.6 Direct and Indirect Effects of Project Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting a pump station on Dolan Road to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The construction and operation of the screened open water intake, the brine discharge facility and the HDD construction of the intake and brine discharge pipelines are the unique components of Alternative 3 that could affect marine biological resources.

In addition to the desalination plant and co-located data center, Alternative 3 would include 6.5 miles of additional desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey desalinated water to other areas (total of 31.5 miles of additional pipeline).

Several components of Alternative 3 would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the “Connection to CalAm” Point on **Figure 5.4-3**, ASR 5 and 6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project, but these components would not affect marine biological resources and are not discussed. Therefore, the marine biological resources impact analysis of Alternative 3 focuses primarily on the new intake and discharge; however, impact conclusions are made for the whole of Alternative 3.

Construction Impacts

Alternative 3 would include the construction of a new screened open water intake system and a new brine discharge system in Monterey Bay within MBNMS. Offshore construction activities would be greater than those described for Alternative 2 because of the larger intake system, the additional discharge structure, and the two intake and two brine discharge pipelines; temporary disturbances and/or loss of seafloor habitat and function would be greater than those discussed for Alternative 2. Construction barges used during placement of both intake and discharge structures would pose temporary obstructions (anchor chains), temporary disturbance and possible loss of soft substrate habitat. HDD construction equipment would be used to install the two intake and two discharge pipelines under the ocean floor and would result in increased underwater noise compared to the proposed project. These activities could cause altered behavior (altered foraging and swimming patterns) in some special status fish, marine mammals, and sea turtles. The possible use of barges from outside Monterey Bay could pose a risk of introducing non-native invasive species and result in collisions with marine mammals and sea turtles.

Similar to Alternative 2, mitigation would be required to reduce the short and long-term impacts of construction on marine biological resources in MBNMS. Although implementation of **Mitigation Measure ALT 2-Marine-1** or similar measures would reduce this impact, it would not be reduced to a less-than-significant level for the same reasons described for Alternative 2. Therefore, compared to the proposed project, the construction of Alternative 3 could result in a substantially increased impact on marine biological resources including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans during construction and would result in an ***increased impact conclusion*** compared to the proposed project; significant and unavoidable even with implementation of **Mitigation Measure ALT 2-Marine 1**.

Alternative 3 would have an increased impact on marine biological resources compared to the proposed project because of the in-water construction described above, but would not cause a fish or marine wildlife population to drop below self-sustaining levels and would not interfere with the movement of any native marine resident or migratory fish or marine wildlife species in MBNMS. Therefore, Alternative 3 would have the ***same impact conclusion*** as the proposed project, less than significant. No impacts would occur from the construction of any other proposed facility because none occur within the marine biological resources study area.

Operational and Facility Siting Impacts

Anchoring of the Alternative 3 intake and outfall structures with collars and ballast rock would result in approximately 16,700 ft^2 of permanent loss of seafloor habitat (about 0.4 acres). This would be a significant and substantially greater impact compared to the proposed project, which would not involve placement of any structures on the seafloor.

Additionally, Alternative 3 would draw up to 55 mgd of source water (compared to 24.1 mgd for the proposed project and Alternatives 1 and 2) through a screened open-water intake. A preliminary assessment determined that northern anchovy, Pacific sardines, white croaker, sanddab, rockfish, smelt, sculpin, Dungeness crab, cancer crabs, and unidentified larval fish would all be entrained (Tenera Environmental, 2014).

The potential ETM/APF for this alternative was estimated at greater than 40 acres (Luster, 2016), and similar to Alternative 2, would result in a significant impact, with mitigation required per the Ocean Plan. **Mitigation Measure ALT 2-Marine-2** would be required to minimize and mitigate for impacts on marine biological resources, but similar to Alternative 2, residual impacts may remain due to the uncertainty of the efficacy of the mitigation.

Furthermore, the Alternative 3 brine discharge would result in an increased impact on marine resources within MBNMS compared to the proposed project since both the volume (about 27 mgd compared to about 14 mgd for the proposed project) and concentration of the brine (about 66 ppt compared to about 58 ppt for the proposed project) would be greater. Modeling performed for the alternative by the proponent determined that the area of salinity that would exceed 2 ppt above natural background levels would extend almost to the boundary of the BMZ, up to 315 feet from the outfall diffuser (Jenkins, 2016). Modeling performed for this EIR/EIS (**Appendix D1**) indicates the brine discharge from the proposed project would only exceed 2 ppt above ambient within a small area at the port and above the seafloor; the brine from the proposed project would be under 2 ppt where it contacts the seafloor within 39 feet of the diffuser (see Section 5.5.3 for details). Therefore, Alternative 3 would result in a larger area of the seafloor that would be exposed to increased salinity concentrations, could potentially cause hypoxia as a result of the extent of the seafloor area exposed to salinities exceeding 2 ppt (i.e. the majority of the area within the BMZ boundary), and could pose direct and indirect impacts on marine fish, invertebrates, marine mammals, and sea turtles in the pelagic waters of the BMZ.

Unlike the proposed project, the open water intake would not pre-filter PCBs through the seafloor; the concentration of PCB-levels in the brine discharge would be greater than the proposed project and would exceed the Ocean Plan water quality objective for PCBs at the edge of the ZID (see Section 5.5.3 for analysis of operational water quality impacts associated with Alternative 3). Implementation of mitigation substantially similar to **Mitigation Measure 4.3-5** (**Implement Protocols to Avoid Exceeding Water Quality Objectives**), but revised specific to the Alternative 3 project final design and defined operating conditions, as described and analyzed in Section 4.3, would reduce the potentially significant impact to less than significant.

In addition, the cooling of the proposed co-located data center would increase the temperature of the brine by up to10° C above ambient ocean waters (the proposed project would have no heat gain). The increased temperature can be expected to result in potential additional impacts adjacent to the outfall, including the establishment of non-native invasive invertebrate and fish species in Monterey Bay by changing the conditions around the outfall to be more habitable.

Therefore, the operation of Alternative 3 would result in a greater impact on marine species, natural community, or habitat, during operations and would result in an ***increased impact conclusion*** compared to the proposed project; impacts would be significant and unavoidable even with implementation of **Mitigation Measure ALT 2-Marine 2** and **Mitigation Measure 4.3-5** (**Implement Protocols to Avoid Exceeding Water Quality Objectives**).

At present, there are no known marine species in Monterey Bay with population numbers suspected of dropping below self-sustaining levels with the exception of the California sea otter which feeds within the study area. Other species would not be threatened to go extinct because of entrainment of juvenile larvae and plankton. Therefore, the potential for the open-water intake to directly or indirectly threaten a marine plant, animal or wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels would be similar to, and would result in the ***same impact conclusion*** as the proposed project, less than significant.

Overall, the operations of Alternative 3 would have a greater impact on marine biological resources in MBNMS compared to the proposed project because of the potential impingement and entrainment resulting from the screened open water intake; from the increased area of seafloor that could be exposed to salinity greater than 2 ppt above ambient; from the increased levels of PCBs in the discharge water; and from the increased heat gain from cooling the co-located data center. It is unknown what mitigation measures would be required to protect the marine biological resources, and whether they would be effective in reducing impacts to less than significant. Therefore, impacts on marine biological resources including candidate, sensitive, or special-status species would be significant and unavoidable even with mitigation. However, the operations of Alternative 3 would not substantially threaten a marine plant, animal or wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels, and would not interfere with the movement of any native marine resident or migratory fish or marine wildlife species in MBNMS.

In addition to physical impacts, Alternative 3 may be inconsistent with MBNMS Desalination Guidelines (NOAA, 2010), with regard to its open water intake and lack of a combined discharge. Guidelines state:

- All desalination plants should be designed and sited to avoid and minimize impingement and entrainment to the extent feasible. Project proponents should investigate the feasibility of using subsurface intakes as an alternative to traditional intake methods.
- Project proponents should investigate the feasibility of diluting brine effluent by blending it with other existing discharges.

Cumulative Analysis

The geographic scope for the Alternative 3 cumulative impact assessment is Monterey Bay, within MBNMS. However, for the reasons described in Section 4.5.6 and in Section 5.5.1, no other reasonably foreseeable projects described in **Table 4.1-2** in Section 4.1 would have the potential to combine with the effects of Alternative 3 to cause a cumulative effect on marine biological resources. However, the existing Moss Landing Power Plant continues to draw 1.2 billion gallons per day for cooling water, which also results in the entrainment of larval fish and plankton. Through a settlement agreement executed on October 9, 2014 between the SWRCB and the current owner of the power plant, the Moss Landing Power Plant must reduce its intake of cooling water to meet an 83.7 percent or greater reduction in mortality from entrainment and impingement impacts beginning with reductions on December 31, 2016 and achieving full compliance by December 31, 2020. The Moss Landing Power Plant owner has indicated its intention to retrofit the power plant’s four generating units to reduce entrainment and impingement impacts in compliance with the OTC policy, and this would likely occur prior to the operation of any desalination project in Moss Landing. No other reasonably foreseeable projects in the context of Alternative 3 would construct or use an open water intake or new discharge pipeline. However, while GWR would create additional brine discharges in Monterey Bay through an existing outfall, the impacts would be less than significant and would be located several miles to the south. Therefore, a cumulative impact analysis is not relevant to Alternative 3.

5.5.5.7 Direct and Indirect Effects of Project Alternative 4 – People’s Moss Landing Water Desalination Project (People’s Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system, intake and discharge pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**).

Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the “Connection to CalAm” Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipelines, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water that originated from the Salinas Valley Groundwater Basin, the proposed Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented.

The construction and operation of the screened open water intake, the brine discharge facility and the construction of the source water and brine discharge pipelines are the unique components of Alternative 4 that could affect marine biological resources. Therefore, the marine biological resources impact analysis of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4.

Construction Impacts

Some of the components of Alternative 4 would utilize existing infrastructure; existing pipelines would be rehabilitated to convey source water and brine between the new desalination plant and the existing caisson on the beach, which would also be rehabilitated. But rather than using HDD to install the entire offshore portion of the pipelines, new intake and discharge pipelines would be laid on the seafloor with concrete collars and protected with approximately 100,000 cubic yards of riprap armoring along the last 1,100 feet and 700 feet, respectively.

Pipeline and intake and discharge system installation activities would result in increased underwater noise, temporary restrictions/barriers to whale and turtle movements, potential vessel collisions with marine mammals and sea turtles, and increased risk of introducing non-native invasive species from the use of construction barges. Similar to Alternatives 2 and 3, mitigation would be required to reduce the short and long-term impacts of construction in MBNMS. Although implementation of **Mitigation Measure ALT 2-Marine-1** or similar measures would reduce this impact, it would not be reduced to a less-than-significant level for the same reasons described for Alternatives 2 and 3. Therefore, the construction of Alternative 4 could result in an increased impact on marine biological resources including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans during construction and would result in an ***increased impact conclusion*** compared to the proposed project; significant and unavoidable even with implementation of **Mitigation Measure ALT 2-Marine 1**.

Alternative 4 would have an increased impact on marine biological resources compared to the proposed project because of the in-water construction described above, but would not cause a fish or marine wildlife population to drop below self-sustaining levels and would not interfere with the movement of any native marine resident or migratory fish or marine wildlife species in MBNMS. Therefore, Alternative 4 would have the ***same impact conclusion*** as the proposed project, less than significant. No impacts would occur from the construction of any other proposed facility because none occur within the marine biological resources study area.

Operational and Facility Siting Impacts

The permanent structures on the seafloor under Alternative 4 would result in the permanent loss of approximately 43,200 ft^2 (about 1 acre) of benthic habitat (1,800 feet of pipeline with 12 feet of riprap per side), affecting marine species dependent on this habitat and habitat function.

Additionally, Alternative 4 would require up to 30 mgd of source water (compared to 24.1 mgd for the proposed project, and Alternatives 1 and 2) through a screened open-water intake. A preliminary assessment determined that northern anchovy, Pacific sardines, white croaker, sanddab, rockfish, smelt, sculpin, Dungeness crab, cancer crabs, and unidentified larval fish would all be entrained (Tenera Environmental, 2014).

The potential APF for the magnitude of the intake under Alternative 4 was estimated at greater than 20 acres (Luster, 2016) and, similar to Alternatives 2 and 3, would require mitigation. Although implementation of **Mitigation Measure ALT 2-Marine-2** or similar measures would reduce operational impacts, they would not be reduced to a less-than-significant level due to the uncertainty of the efficacy of the mitigation.

Furthermore, impacts associated with brine discharge would be increased compared to the proposed project since the volume and concentration of the brine would be greater (about 17 mgd compared to about 14 mgd for the proposed project). No dilution modeling conducted by the proponent, if any, has been made available; therefore, it is currently unknown if the proposed 16-inch diffusers would be capable of meeting salinity concentrations and other Ocean Plan water quality objectives. Unlike the proposed project, the open water intake would not pre-filter PCBs through the seafloor and the concentration of the PCB-levels in the brine discharge would be greater than the proposed project. Implementation of a measure similar to **Mitigation Measure 4.3-5** (Implement Protocols to Avoid Exceeding Water Quality Objectives) could potentially reduce the significant impact. However, the design of the diffuser is not consistent with the Ocean Plan which states that brine discharge technologies other than wastewater dilution and multiport diffusers may be used if an owner or operator can demonstrate to the regional water board that the technology provides a comparable level of intake and mortality of all forms of marine life. It has not been demonstrated that the 16-inch diffusers would be effective at reducing the impacts since there has been no modeling conducted by the proponent, it is unknown if other mitigation would be required to protect the marine biological resources within MBNMS, and whether mitigation would be effective in reducing impacts to less than significant. Therefore, the overall operation of Alternative 4 would result in a greater potential impact on marine species, natural community, or habitat, during operations and would result in an ***increased impact conclusion*** compared to the proposed project; impacts would be significant and unavoidable even with implementation of **Mitigation Measure ALT 2-Marine 2** and **Mitigation Measure 4.3-5** (**Implement Protocols to Avoid Exceeding Water Quality Objectives**).

At present, there are no known marine species in Monterey Bay with population numbers suspected of dropping below self-sustaining levels with the exception of the California sea otter which feeds within the study area. Other species would not be threatened to go extinct because of entrainment of juvenile larvae and plankton. Therefore, the potential for Alternative 4 to directly or indirectly threaten a marine plant, animal or wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels would be similar to, and would result in the ***same impact conclusion*** as the proposed project, less than significant.

In addition to physical impacts, Alternative 4 may be inconsistent with MBNMS Desalination Guidelines (NOAA, 2010), with regard to its open water intake and lack of a combined discharge. Guidelines state:

- All desalination plants should be designed and sited to avoid and minimize impingement and entrainment to the extent feasible. Project proponents should investigate the feasibility of using subsurface intakes as an alternative to traditional intake methods.
- Project proponents should investigate the feasibility of diluting brine effluent by blending it with other existing discharges.

Cumulative Analysis

The geographic scope for the Alternative 4 cumulative impact assessment is Monterey Bay, within MBNMS. The only project relevant to the cumulative scenario for Alternative 4 is the DeepWater Desal project (No. 34), described in **Table 4.1-2** in Section 4.1.

Cumulative impacts from construction would be of a similar nature to those described for the cumulative scenario under Alternative 2, though increased due to the larger area of temporary construction impacts under Alternative 4. For the same reasons described for Alternative 2, even with mitigation, Alternative 4 would result in a significant contribution to the significant and unavoidable cumulative impacts of construction.

Combined, Alternative 4 (43,200 ft^2) and the DeepWater Desal Project (16,700 ft^2) would result in the permanent loss or change of approximately 59,900 ft^2 of benthic habitat. Additionally, the operation of the open-water intake would result in the entrainment of plankton and larval fish, including those of the DeepWater Desal Project (APF of greater than 40 acres), resulting in a cumulative APF estimated at greater than 60 acres (Luster, 2016). However, the existing Moss Landing Power Plant continues to draw 1.2 billion gallons per day for cooling water, which also results in the entrainment of larval fish and plankton. Through a settlement agreement executed on October 9, 2014 between the SWRCB and the current owner of the power plant, the Moss Landing Power Plant must reduce its intake of cooling water to meet an 83.7 percent or greater reduction in mortality from entrainment and impingement impacts beginning with reductions on December 31, 2016 and achieving full compliance by December 31, 2020. The Moss Landing Power Plant owner has indicated its intention to retrofit the power plant’s four generating units to reduce entrainment and impingement impacts in compliance with the OTC policy and this would likely occur prior to the operation of any desalination project in Moss Landing. Regardless, the retrofit of the power plant would not offset the adverse cumulative impact attributable to entrainment and impingement at the screened open water intake component of Alternative 4, and these potential losses are considered a significant cumulative impact. As stated above, mitigation to compensate for the loss of habitat would be necessary, but the efficacy of the available mitigation options has not been tested. Therefore, Alternative 4 plus the DeepWater Desal Project could still result in a significant and unavoidable impact, with Alternative 4 having a significant contribution to such cumulative impact (significant and unavoidable).

Because it is unknown if the proposed 16-inch diffusers are capable of meeting salinity concentrations and other Ocean Plan water quality objectives, and because the open water intake would not pre-filter the PCBs through the seafloor, the salinity, PCB, and other Ocean Plan constituent levels in the brine discharge could result in exceedances of Ocean Plan water quality objectives. For the same reasons described for exceedances of salinity objectives in Section 4.5.6, this would result in a significant cumulative impact related to salinity and other Ocean Plan constituent concentrations. For salinity and other Ocean Plan constituents, it is unknown whether mitigation would be effective in reducing impacts to a level that is less than significant (significant and unavoidable).

5.5.5.8 Direct and Indirect Effects of Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction Impacts

Construction impacts of Alternatives 5a and 5b would be of the same types as described for the proposed project and Alternative 1, respectively, but reduced in proportion to the reduced number of slant wells. Therefore, Alternative 5 would result in reduced impact on marine biological resources within MBNMS, and would result in the ***same impact conclusion*** compared to the proposed project, less than significant.

Operational and Facility Siting Impacts

Slant well operation under Alternative 5a would be the same as the proposed project and would not affect marine biological resources. However, for the same reasons explained for Alternative 1, pumping from slant wells at Potrero Road under Alternative 5b would result in drawing or diverting water from Elkhorn Slough. This would result in a greater impact on marine biological habitat and associated species compared to the proposed project and Alternative 1; therefore, Alternative 5b would result in an ***increased impact conclusion*** compared to the proposed project because of the drawdown and the impact would be significant and unavoidable.

Impacts from brine discharges under Alternatives 5a and 5b would result in a reduced impact compared to the proposed project and Alternative 1 due to the decreased brine discharge volumes (about 9 mgd compared to about 14 mgd for the proposed project and Alternative 1) and reduced distance from the diffuser to the edge of the ZID (up to 30 feet from the diffuser for Alternative 5a or 5b, as compared to 39 feet for the proposed project). Alternative 5 (either 5a or 5b) would not exceed or violate salinity standards defined in the Ocean Plan. As with the proposed project and Alternative 1, Alternative 5 could result in a significant impact related to Ocean Plan water quality objectives for a number of constituents. Implementation of **Mitigation Measure 4.3-4** would require CalAm to monitor the discharges in a manner consistent with Ocean Plan requirements to ensure the modeled dilutions are being met, and if not, implementation of **Mitigation Measure 4.3-5** would reduce or avoid the impact on water quality and thus reduce or avoid impacts on marine habitats and biota, including special-status species. Alternative 5 would result in the ***same impact conclusion*** compared to the proposed project, less than significant.

At present, there are no known marine species in Monterey Bay with population numbers suspected of dropping below self-sustaining levels with the exception of the California sea otter which feeds within the study area. The operation of Alternative 5a and 5b would not cause a fish or marine wildlife population to drop below self-sustaining levels and would not interfere with the movement of any native marine resident or migratory fish or marine wildlife species in MBNMS. Therefore, Alternative 5a and 5b and would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

Combined Impacts with GWR Project

The GWR Project (No. 59) described in **Table 4.1-2** in Section 4.1 would discharge reverse osmosis-treated effluent through the MRWPCA's existing outfall. The water quality effects of the various discharge scenarios in the cumulative context of Alternative 5 and the GWR Project are described in Section 5.5.3.8 in the cumulative analysis of surface water quality impacts under Alternative 5. As described therein, all discharges associated with the Alternative 5 cumulative scenario would result in salinity less than 2 ppt above ambient levels at the edge of the ZID and at the edge of the BMZ, and would therefore not exceed or violate the salinity standards or degrade water quality in terms of salinity, and thus be protective of the marine biota and habitat of Monterey Bay. As was determined for other alternatives, with the addition of GWR effluent to operational discharges under Alternative 5, under certain scenarios some constituent concentrations would become elevated to levels greater than 80 percent of the Ocean Plan objective. Also, for an additional eleven constituents, there is not enough information to assess concentrations at the edge of the ZID due to differences in MRLs used to assess the source waters or due to MRLs being higher than Ocean Plan objectives. Therefore, it is conservatively concluded that Ocean Plan water quality objectives could potentially be exceeded during operations for some operational discharge scenarios, resulting in a significant impact. Therefore, Alternative 5 in combination with the GWR Project could result in a significant impact related to water quality. Exceedances of Ocean Plan water quality objectives could result in significant impacts on marine resources, of which these water quality objectives are meant to be protective. However, impacts would be reduced to a less-than-significant level by implementing **Mitigation Measures 4.3-4** and **4.3-5**, which would ensure compliance with Ocean Plan objectives and monitoring requirements. Implementation of these Mitigation Measures would reduce combined impacts, and Alternative 5's contribution, to less than cumulatively significant (less than significant with mitigation). The combined impact of Alternative 5 and the GWR Project would result in the ***same impact conclusion*** on marine resources related to brine discharges compared to the proposed project, less than significant with mitigation.

Impacts of Full Cumulative Scenario

The cumulative setting and geographic area for Alternatives 5a and 5b would be the same as that described in Section 4.5.6 and as for Alternative 1, and would include DeepWater Desal. With the exception of impacts related to brine discharge, cumulative impacts from the construction and operation of Alternative 5a would be the same or slightly less than those described for the cumulative impacts for the proposed project, as described in Section 4.5.6. Therefore, Alternative 5a would result in a less than significant contribution to cumulative impacts on marine habitats and associated biological resources and cumulative impacts would be less than significant. Alternative 5b would have the same type and intensity of effects as Alternative 5a, but would result in the additional impact on surface water flows and volumes in Elkhorn Slough, as described above. Although the additional impact of Alternative 5b on surface water flow and volumes in Elkhorn Slough would be significant and unavoidable, as discussed in Section 5.5.4.3 regarding groundwater impacts, no other projects are located in the same geographic area and have the potential to affect groundwater resources in the Perched A Aquifer, which in turn could result in impacts on surface water in Elkhorn Slough. Because no other projects would affect surface water flows and volumes in Elkhorn Slough, a cumulative impact analysis is not relevant to this impact.

5.5.5.9 References

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5.5.6 Terrestrial Biological Resources

The evaluation criteria for Terrestrial Biological Resources address: candidate, sensitive, or special-status species; riparian habitat or other sensitive natural communities; critical habitat; federally protected wetlands, federal "other waters," and waters of the state; movement of native resident or migratory fish or wildlife species, established native resident or migratory wildlife corridors, or native wildlife nursery sites; consistency with local policies or ordinances protecting biological resources; spread of invasive non-native species; and consistency with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

5.5.6.1 Setting/Affected Environment

The general environmental setting and regulatory framework for components of the alternatives in common with the proposed project would be similar to that described for the proposed project in Section 4.6.

Several alternatives include a pipeline route in common, which extends north from Charles Benson Road along an abandoned railroad alignment to Monte Road, then follows Nashua Road, Molera Road and Highway 1 to either Potrero Road (Alternatives 1 and 5b) or Dolan Road (Alternatives 2, 3, and 4). Vegetation communities and wildlife habitats along these routes are primarily agricultural fields, but with several crossings of tidal rivers and sloughs (Salinas River, Old Salinas River, Tembladero Slough, and Moro Cojo Slough). Salt marsh and brackish marsh vegetation is associated with the latter three, and is therefore in greater abundance than in the study area for the proposed project.

Alternative 1 and 5b slant wells at Potrero Road would be situated in an existing unpaved parking lot, but adjacent to restored and native central dune scrub vegetation with a potential to support special status plant and wildlife species.

The East Tank Farm Parcel (Alternative 3) is a remediated and capped site that supports non-native grassland and seasonal wetlands, with the potential to support California red-legged frog, California tiger salamander, and Santa Cruz long-toed salamander aquatic breeding and upland aestivation habitat (EMC Planning Group, Inc., 2016). This habitat type also supports burrowing owl, nesting birds, and American badger, as well as special-status plants.

The former National Refractories facility site (Alternative 4) is a largely disturbed post-industrial site with magnesium oxide waste, but includes a small drainage and salt marsh vegetation connected hydrologically to Moro Cojo Slough.

5.5.6.2 Direct and Indirect Effects of Proposed Project (Slant Wells at CEMEX)

Impact 4.6-1: Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly, indirectly, or through habitat modification, during construction.

Construction could result in direct impacts on special-status plants through mortality of individuals during earthwork and loss of habitat. Indirect impacts on plants can result from population fragmentation, introduction of non-native weeds, and interference with plant metabolic processes from construction effects such as fugitive dust and sedimentation. Construction can result in direct impacts on wildlife by direct trampling or entrapment of individuals and habitat removal. Indirect impacts on wildlife can occur from harassment, behavior disruption, increased predation, nest abandonment, and degradation of habitat. Significant impacts on special-status plant and animal species could occur during construction at all of the proposed MPWSP facility sites and pipeline alignments; however, all impacts could be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1d (Protective Measures for Western Snowy Plover)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly)**, **4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard)**, **4.6-1h (Avoidance and Minimization Measures for Western Burrowing Owl)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1j (Avoidance and Minimization Measures for American Badger)**, **4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat)**, **4.6-1l (Avoidance and Minimization Measures for Special-status Bats), 4.6-1m (Avoidance and Minimization Measures for Native Stands of Monterey Pine)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, **4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander)**, **4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-1q (Frac-out Contingency Plan)**, **4.12-1b (General Noise Controls for Construction Equipment)**, and **4.14-2 (Site-Specific Construction Lighting Measures)**.

Impact 4.6-2: Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during construction.

Project construction could result in significant impacts on sensitive natural communities (including riparian habitat) and critical habitat. The subsurface slant wells, MPWSP Desalination Plant, and Source Water Pipeline would result in significant impacts on central dune scrub; the new Desalinated Water Pipeline would result in significant impacts on central dune scrub, coast live oak woodland, and riparian woodland and scrub; the new Transmission Main would result in significant impacts on central dune scrub, coast live oak woodland, and northern coastal scrub; the Castroville Pipeline would result in significant impacts on central dune scrub, northern coastal scrub, riparian woodland and scrub, and freshwater marsh; the ASR facilities would result in significant impacts on coast live oak woodland, northern coastal scrub, and central maritime chaparral; the Ryan Ranch-

Bishop Interconnection Improvements would significantly impact coast live oak woodland and northern coastal scrub; the Main System-Hidden Hills Interconnection Improvements would result in significant impacts on coast live oak woodland; and proposed project staging areas would significantly impact coast live oak woodland and northern coastal scrub.

Construction of the subsurface slant wells and portions of the Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, new Transmission Main, and a staging area would occur within local coastal zones in areas where certain vegetation communities may be designated environmentally significant habitat areas (ESHA) under Local Coastal Programs (LCPs). Construction within vegetation communities designated as primary habitat or ESHA under an LCP would result in significant impacts on these sensitive natural communities.

Construction of the subsurface slant wells and Source Water Pipeline would result in significant impacts on critical habitat for western snowy plover; and construction of the Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements would result in significant impacts on critical habitat for California red-legged frog. None of the other project facilities would result in significant impacts on critical habitat.

Construction of the Brine Discharge Pipeline and Pipeline to CSIP Pond would result in less-than-significant impacts on sensitive natural communities or critical habitat. All impacts on sensitive natural communities and critical habitat would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.6-1a**, **4.6-1b**, **4.6-1c**, **4.6-1d**, **4.6-1n**, **4.6-1o**, **4.6-1p, 4.6-1q, 4.6-2a** (**Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas**), and **4.6-2b** (**Avoid, Minimize, and Compensate for Construction Impacts on Sensitive Communities and Environmentally Sensitive Habitat Areas**).

Impact 4.6-3: Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during construction.

Direct impacts on wetlands include removal of vegetation, soil, or structures and/or the placement of fill in the wetland, or hydrological modifications (i.e. altering the flow of water in or out of the wetland or water). Indirect impacts could occur from construction activities or construction worker foot traffic that inadvertently extend beyond the designated construction work area and into waters or wetland features, trash and debris left in the features following construction, sedimentation of the feature as a result of increased soil erosion from construction work areas, and degradation of water quality from pollutants (e.g., oil, hydraulic fluid) that are conveyed by surface runoff from the construction site to offsite waters. With respect to sedimentation and degradation of water quality from construction pollutants, for all proposed project components, implementation of the BMPs in the project-specific SWPPP would include measures to manage soil erosion and protect water quality in receiving waterbodies.

Construction of the new Desalinated Water Pipeline, Castroville Pipeline, Carmel Valley Pump Station, and Ryan Ranch-Bishop Interconnection Improvements would result in direct impacts on potential waters of the U.S. and/or waters of the State. Construction of the subsurface slant wells, Source Water Pipeline, Castroville Pipeline, Brine Discharge Pipeline and Pipeline to CSIP Pond, new Transmission Main, and Ryan Ranch-Bishop Interconnection Improvements could result in significant indirect impacts on wetlands/waters if construction activities or construction worker foot traffic were to extend beyond the designated construction work area.

Less than significant impacts on wetlands/waters would occur during construction of the MPWSP Desalination Plant or proposed ASR facilities, and staging areas because no waters of the U.S. or waters of the state occur within or adjacent to these sites. All significant direct and indirect impacts would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.6-1a**, **4.6-1b**, **4.6-1c**, and **4.6-3** (**Avoid, Minimize, and or Mitigate Impacts on Wetlands**).

Impact 4.6-4: Be inconsistent with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

With the exception of the subsurface slant wells and staging areas, all other proposed project facilities have the potential to conflict with a local tree ordinance, either by requiring removal or resulting in injury to a protected tree, which would be a significant impact. This significant impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.6-4** (**Compliance with Local Tree Ordinances**).

A significant unavoidable impact would occur resulting from development within primary habitat as designated under the City of Marina LCLUP at the subsurface slant wells, Source Water Pipeline, and potentially the new Desalinated Water Pipeline, new Transmission Main, and a staging area, which would be inconsistent with the City of Marina LCLUP policies. Mitigation Measures 4.6-1d, 4.6-1e, 4.6-1f, 4.6-1n, and 4.6-2b (See Impact 4.6-1 above, for the names of these mitigation measures) would be implemented to reduce impacts to special-status species habitat. No mitigation measures are available that would reduce the project's conflict with City of Marina LCLUP policies, a significant and unavoidable impact.

Impact 4.6-5: Introduce or spread an invasive non-native species during construction.

Project construction activities at the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, proposed ASR facilities, and new Transmission Main, could contribute to the spread of invasive plants and/or introduce new invasive plants to the project area or adjacent lands with native plant communities through earth moving, transport of vehicles, equipment and materials, and unanticipated sediment dispersal during rain events, which would be a significant impact. This significant impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.6-1a** and **4.6-1p** (see Impact 4.6-1 above, for the names of these mitigation measures).

Construction activities at the Brine Discharge Pipeline, Pipeline to CSIP Pond, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas are not expected to result in the introduction or spread of invasive non-native species.

Impact 4.6-6: Result in substantial adverse effects on candidate, sensitive, or special-status species during project operations.

Routine maintenance of the subsurface slant wells would be conducted every 5 years and access to the wells would be from the wellheads. Estimated disturbance area for maintenance is roughly 6 acres which include the access roads and staging. Maintenance activities would be conducted between October and February to avoid the snowy plover nesting season. This maintenance could result in significant impacts on special-status plant and wildlife species with potential to occur in the central dune scrub at the slant wells that are similar to the impacts of slant well construction. Routine maintenance would also result in loss of snowy plover nesting habitat, which would be a significant impact. However, with implementation of the same mitigation measures prescribed for construction, these impacts would be reduced to a less-than-significant level.

The 3-million-gallon brine storage basin at the MPWSP Desalination Plant could attract waterfowl. Migratory waterfowl could become sick or die from use of the brine storage basin, which would be a significant impact. However, with implementation of **Mitigation Measure 4.6-6** (**Installation and Monitoring of Bird Deterrents at the Brine Storage Basin**), the impact would be reduced to a less-than-significant level.

Maintenance and operations of all other proposed facilities would not result in substantial noise increases, new permanent sources of glare or light, or foreseeable surface disturbance in undeveloped areas. Therefore, no impact or less than significant impacts on special-status species would result from implementation of all other facilities.

Impact 4.6-7: Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during project operations.

Routine maintenance of the subsurface slant wells would result in significant impacts on central dune scrub sensitive natural community, primary habitat under the City of Marina LCLUP/ESHA, and critical habitat for western snowy plover. However, with implementation of the same mitigation measures prescribed for construction, these impacts would be reduced to a less-than-significant level.

Maintenance and operations of all other proposed facilities would not result in foreseeable surface disturbance in undeveloped areas, and would result in negligible impacts relative to this criterion.

Impact 4.6-8: Result in substantial adverse effects on federal wetlands, federal other waters, and waters of the state during project operations.

Periodic maintenance of the subsurface slant wells could adversely affect the CEMEX settling ponds through indirect disturbance by worker foot or vehicle traffic, resulting in a significant impact. However, with implementation of some of the same mitigation measures prescribed for construction, these impacts would be reduced to a less-than-significant level.

Maintenance and operations of all other proposed facilities would not result in foreseeable surface disturbance in undeveloped areas. Implementation of these facilities would result in negligible impacts relative to this criterion.

Impact 4.6-9: Introduce or spread an invasive non-native species during project operations.

Maintenance activities at the subsurface slant wells would include ground disturbance, which could contribute to the spread of invasive plants and/or introduce new invasive plants to the project area or adjacent lands with native plant communities through earth moving, transport of vehicles, equipment and materials, and unanticipated sediment dispersal during rain events, resulting in a significant impact. However, with implementation of **Mitigation Measures 4.6-1a** and **4.6-1p** (see Impact 4.6-1 above, for the names of these mitigation measures), these impacts would be reduced to a less-than-significant level.

Maintenance and operations of all other proposed facilities would not result in foreseeable surface disturbance in undeveloped areas. Implementation of these facilities would result in negligible impacts relative to this criterion.

Impact 4.6-10: Be inconsistent with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan or other approved local, regional, or state habitat conservation plan.

A portion of the new Transmission Main could conflict with the *1997 Installation-Wide Multispecies Habitat Management Plan (HMP)* for the former Fort Ord area, which is considered a significant impact. Implementation of **Mitigation Measures 4.6-1a**, **4.6-1n**, and **4.6-2b** (See Impact 4.6-1 and 4.6-2 above, for the names of these mitigation measures) would reduce the impact to a less-than-significant level.

The proposed ASR Facilities and some staging areas are located within the HMP area and would be located within designated development areas. Construction and operations of these facilities would therefore, be consistent with the HMP.

None of the other project components are located within an approved HMP/HCP area.

Impact 4.6-C: Cumulative impacts related to terrestrial biological resources.

The incremental effects of the MPWSP would have a less than significant cumulative effect on special-status species, sensitive natural communities, wetlands or other waters, conflicts with local tree ordinances, and consistency with an adopted habitat conservation plan. Implementation of the MPWSP would have a cumulatively significant contribution to the test slant well impact related to inconsistencies with the City of Marina LCLUP policies. Mitigation Measures 4.6-1d, 4.6-1e, 4.6-1f, 4.6-1n, and 4.6-2b (See Impact 4.6-1 above, for the names of these mitigation measures) would be implemented to reduce impacts on special-status species habitat, but no mitigation measures are available that would reduce the impact of conflicting with the City of Marina LCLUP policies, and it would remain significant and unavoidable.

To facilitate review of the following sections, the full suite of mitigation measures associated with terrestrial biological resource impacts include the following:

4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.

4.6-1b: Construction Worker Environmental Awareness Training and Education Program.

4.6-1c: General Avoidance and Minimization Measures.

4.6-1d: Protective Measures for Western Snowy Plover.

4.6-1e: Avoidance and Minimization Measures for Special-status Plants.

4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly.

4.6-1g: Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard.

4.6-1h: Avoidance and Minimization Measures for Western Burrowing Owl.

4.6-1i: Avoidance and Minimization Measures for Nesting Birds.

4.6-1j: Avoidance and Minimization Measures for American Badger.

4.6-1k: Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat.

4.6-1l: Avoidance and Minimization Measures for Special-status Bats.

4.6-1m: Avoidance and Minimization Measures for Native Stands of Monterey Pine.

4.6-1n: Habitat Mitigation and Monitoring Plan.

4.6-1o: Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander.

4.6-1p: Control Measures for Spread of Invasive Plants

4.6-1q: Frac-out Contingency Plan

4.6-2a: Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas.

4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas.

4.6-3: Avoid, Minimize, and or Mitigate Impacts to Wetlands.

4.6-4: Compliance with Local Tree Ordinances.

4.6-6: Installation and Monitoring of Bird Deterrents at the Brine Storage Basin.

4.6-8: Management Requirements within Borderland Development Areas along Natural Resource Management Area Interface.

5.5.6.3 Direct and Indirect Effects of No Project Alternative

The No Project Alternative would avoid the construction-related impacts of the proposed project. Direct or indirect impacts on biological resources, including species, habitat, and wetlands, would not occur because there would be no ground disturbance. However, the decommissioning of the existing test slant well could result in potentially significant but mitigable impacts on terrestrial biological resources, including:

- Special-Status Species. See Impact 4.6-1 in Section 4.6.5.1. Implementation of Mitigation Measures 4.6-1a through 4.6-1g, 4.6-1i, 4.6-1n, 4.6-1p, 4.12-1b, and 4.14-2 would reduce impacts to a less-than-significant level.

- Sensitive natural communities and critical habitat. See Impact 4.6-2 in Section 4.6.5.1. Implementation of Mitigation Measures 4.6-1a through 4.6-1d, 4.6-1n, 4.6-1p, 4.6-2a, and 4.6-2b would reduce impacts to a less-than-significant level.
- Introduction or spread of invasive non-native species. See Impact 4.6-5 in Section 4.6.5.1. Implementation of Mitigation Measures 4.6-1a and 4.6-1p would reduce impacts to a less-than-significant level.

Under the No Project Alternative, current diversions from the Carmel River would continue consistent with existing conditions in the short-term. However, under the No Project Alternative, CalAm would not meet Milestone 3 by September 30, 2018 (receipt of a CPCN from the CPUC), nor would it meet the subsequent annual milestones associated with the construction and implementation of the MPWSP. CalAm's Effective Diversion Limit (EDL) from the Carmel River would be reduced under the terms of the CDO by 1,000 afy in October 2018, and by an additional 1,000 afy in each subsequent year until October 2021. Beginning in January 2022, as with the proposed project, CalAm would only be allowed to divert its legal entitlement of 3,376 afy from the Carmel River. See Section 5.4.2 for details on the amounts of water allowed by the CDO to be diverted each year until the CDO expiration. Therefore, under the No Project Alternative, diversions from the Carmel River would be reduced sooner than under the proposed project and Carmel River flows would be restored by a total of 10,000 acre-feet over the period of October 2018 through 2021. The increases to Carmel River flows under the No Project Alternative would be beneficial to Carmel River steelhead habitat.

Cumulative Analysis

In addition to the beneficial effect of increased streamflows in the Carmel River that would occur under the No Project Alternative compared to existing conditions, the GWR Project (No. 59 in **Table 4.1-2**) would provide water supply to CalAm that would further reduce CalAm's diversions from the Carmel River, per the terms of the CDO (SWRCB, 2016). This would also benefit riparian species as discussed in SWRCB Order 95-10. Specifically, for every acre-foot of GWR Project water supply that CalAm is able to deliver to the Monterey District, CalAm must reduce its Carmel River system diversions by one acre-foot. Therefore, if GWR Project water becomes available to CalAm prior to 2022 (when Carmel River diversions would be limited to the 3,376 afy legal limit regardless of other water sources), CalAm's diversions from the Carmel River would be reduced compared to those described in **Table 5.4-3**, leaving more streamflow in the Carmel River than under the No Project Alternative alone. This would be a cumulative beneficial effect on steelhead and riparian habitat in the Carmel River.

Since no construction would occur under the No Project Alternative, and impacts from decommissioning of the test slant well would be less than significant with mitigation, the No Project Alternative contribution to cumulative impacts would be less than significant.

5.5.6.4 Direct and Indirect Effects of Project Alternative 1 – Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.4.3). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**). Therefore, the analysis of impacts of Alternative 1 on terrestrial biological resources focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 1.

Construction Impacts

With respect to effects on special-status species and their habitat, Alternative 1 would reduce the potential for impacts associated with the subsurface slant wells and increase the potential for impacts associated with risk of frac-out using HDD crossings, including the release of bentonite slurry into nearby waterways. Similar to the proposed project, construction of new subsurface slant wells at Potrero Road could result in significant indirect impacts on adjacent sensitive habitats, including central dune scrub, salt marsh, and a tidal slough. Due to the disturbed nature of the location of the Alternative 1 subsurface slant wells, the area would provide lower quality habitat for federal and state-listed endangered species, including western snowy plover (which mainly consists of sensitive central dune scrub vegetation) compared to the proposed project by avoiding disturbance of 9 acres of central dune scrub habitat. Some indirect or temporary impact could occur, but it would be substantially less than what would result from construction of the new subsurface slant wells at the CEMEX mining area. Western snowy plover are not known to breed or winter in the vicinity of the Potrero Road parking lot construction site, but may still occur on the beach west of the site. Other special-status species with potential to occur adjacent to the Potrero Road parking lot could include Smith’s blue butterfly, black legless lizard, Monterey spineflower, Menzies wallflower, sand gilia, and other special-status plants, as described in Section 4.6.1.8 and summarized in **Table F-1** of **Appendix F**. Special-status plants could be indirectly impacted from population fragmentation, introduction of non-native weeds, and interference with plant metabolic processes caused by construction fugitive dust and sedimentation. Special-status wildlife could be indirectly impacted from harassment, behavior disruption, increased predation, nest abandonment, and degradation of habitat caused by construction noise and soil erosion. Implementation of **Mitigation Measures 4.6-1a** through **4.6-1p**, **4.12-1b**, and **4.14-2** (see Section 5.5.6.2 for the names of these mitigation measures) would reduce these impacts to less than significant.

Additionally, construction of the alternative source water pipeline north of Charles Benson Road could result in significant impacts at multiple river and tidal slough crossings and associated wetlands, including an additional separate pipeline crossing of Tembladero Slough at Molera Road, and of Old Salinas River at Potrero Road, and wetlands adjacent to the pipeline route. Although not anticipated, there is potential for frac-outs to occur using HDD. If a frac-out occurs, bentonite slurry could be released into the Salinas River and/or Tembladero Slough, which could degrade water quality and adversely impact steelhead habitat and/or individual fish by increasing suspended sediments that may inhibit fish respiration and degrade habitat, a significant impact.

Implementation of **Mitigation Measure 4.6-1q** (Frac-out Contingency Plan) would reduce this impact to less than significant.

The Alternative 1 source water pipeline alignment provides lower habitat value for special-status plant and animal species in comparison with the proposed project's Source Water Pipeline alignment, resulting in a less severe impact on special-status plants and animals; nonetheless, identified mitigation measures for construction would be required. All other components and potential impacts under Alternative 1 would be the same as in the proposed project. Thus, with respect to adverse effects on special-status species, combining the impacts of the proposed project components with the addition of 5.5 miles of source water pipeline and the slant wells at Potrero Road, construction would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

With respect to effects on riparian habitat, critical habitat, and other sensitive natural communities, Alternative 1 would reduce the amount of impact on designated critical habitat and ESHA compared to the proposed project by using the less sensitive unpaved parking lot at Potrero Road (avoiding 9 acres of central dune scrub, a sensitive natural community,and primary habitat under the City fo Marina LCLUP). The Alternative 1 source water pipeline would have less severe impacts on central dune scrub than the MPWSP Source Water Pipeline and impacts on northern coastal scrub and riparian woodland and scrub sensitive natural communities similar to the Castroville Pipeline. Similar types of indirect impacts on western snowy plover critical habitat would occur under Alternative 1 as under the proposed project. Additional potential indirect impacts on Monterey spineflower critical habitat would occur at Potrero Road. All other components and potential impacts under Alternative 1 would be the same as in the proposed project, and could be reduced to less than significant through implementation of **Mitigation Measures 4.6-1a** through **4.6-1e**, **4.6-1n**, **4.6-1o**, **4.6-1p**, **4.6-2a**, and **4.6-2b** (see Section 5.5.6.2 for the names of these mitigation measures). Thus, with respect to riparian habitat, critical habitat, and sensitive natural communities, combining the impacts of the proposed project components with the addition of 5.5 miles of source water pipeline and the slant wells at Potrero Road, construction would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Alternative 1 would increase the potential for construction impacts on wetlands at multiple crossings of open water features, but could avoid or minimize those significant impacts to less than significant through the use of trenchless construction methods and implementation of the mitigation measures identified for the proposed project in Section 4.6 (**Mitigation Measures 4.6-1a** through **4.6-1c**, **4.6-1g**, and **4.6-3**). Therefore, with respect to wetlands, combining the impacts of the proposed project components with the addition of 5.5 miles of source water pipeline and slant wells at Potrero Road, although the potential for significant impacts would increase, construction would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Alternative 1 would avoid slant well construction within primary habitat at the CEMEX site. However, similar to the proposed project, the desalinated water pipeline and transmission main under Alternative 1 would be constructed within primary habitat in the City of Marina. The City of Marina LCLUP prohibits development in primary habitat that is not protective of and dependent upon that resource. Therefore, construction of the desalinated water pipeline and transmission main would conflict with the City of Marina LCLUP policies. Additionally, Alternative 1 would result in the development of the subsurface slant wells at Potrero Road within 100 feet of the Old Salinas River (see **Figure 5.4-1**, inset). This development would conflict with Policy 2.3.3.B4 of the North County LCP/LUP, which requires a setback of 100 feet from the landward edge of vegetation of all coastal wetlands (such as those present along the Old Salinas River) to be provided and maintained in open space use, and requires that no permanent structures except for those necessary for resource-dependent use which cannot be located elsewhere can be constructed in the setback area. Prior to approval of all proposed structures in the setback area, it must be demonstrated that the development does not significantly disrupt the habitat resource. It is noted that the Alternative 1 subsurface slant well construction would occur within the disturbed parking lot area and would not significantly disrupt habitat in this location; nonetheless, because the subsurface slant wells are not a resource-dependent use, they would conflict with this policy. No mitigation is available to reduce this impact to a less-than-significant level. All other facilities common with the proposed project have the potential to conflict with a local tree ordinance, either by requiring removal or resulting in injury to a protected tree, which would be a significant impact. This significant impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.6-4** (**Compliance with Local Tree Ordinances**). Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, significant and unavoidable, as a result of the impact related to conflict with the Marina LCLUP and the North County LCP/LUP policies.

The additional 5.5 miles of source water pipeline under Alternative 1 would increase the potential for pipeline construction to introduce or spread an invasive non-native species. Locating the subsurface slant wells at Potrero Road would decrease the potential for slant well construction to spread invasive species within central dune scrub. This significant impact could be avoided or minimized to less than significant through implementation of **Mitigation Measures 4.6-1a** and **4.6-1p** (see Section 5.5.6.2 for the names of these mitigation measures). Thus, with respect to invasive species, combining the impacts of the proposed project components with the addition of 5.5 miles of source water pipeline and the slant wells at Potrero Road, construction would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

With respect to operational impacts on special-status species and their habitat, disturbance from maintenance of the slant wells at Potrero Road would result in a reduced impact on western snowy plover habitat compared to the proposed project; however, significant indirect impacts could still occur and would be reduced to less than significant with **Mitigation Measure 4.6-1d (Protective Measures for Western Snowy Plover)**. Indirect impacts on central dune scrub habitat, which borders the Potrero Road slant well site, and special-status plants and animals known to occur or with potential to occur in this habitat, would be less severe than operations and maintenance activities at the CEMEX mining facility under the proposed project. Additional indirect impacts on special-status species with potential to occur in the Old Salinas River, adjacent to the east of the parking lot, could occur during operations and maintenance activities under Alternative 1. Noise generated during operation of the pumping wells at Potrero Road would be more severe than at the CEMEX facility due to the relative lower baseline noise environment; however, this difference would not change the impact level of significance. Operation of the pumping wells would not produce groundborne vibration and, therefore, there would be no impacts on special-status species from vibration. This is the same as described for the proposed project. Operation and maintenance of components common to the proposed project would be the same as described in Impact 4.6-6. Implementation of **Mitigation Measures 4.6-1a** through **4.6-1g, 4.6-1i, 4.6-1n, 4.6-1p** (see Section 5.5.6.2 for the names of these mitigation measures), **Mitigation Measure 4.6-6 (Installation and Monitoring of Bird Deterrents at the Brine Storage Basin)**, **Mitigation Measure 4.12-5 (Stationary Source Noise Controls)**, and **Mitigation Measures 4.14-2 (Site-Specific Nighttime Lighting Measures)** would reduce this impact to less than significant. Therefore, with respect to impacts on special-status species, combining the proposed project components with those unique to Alternative 1, operation would result in a reduced impact due to the lower habitat value at the slant well site, but would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

With respect to operational impacts on riparian habitat, critical habitat, or other sensitive natural communities, operation and maintenance of the Alternative 1 subsurface slant wells at Potrero Road would occur in and around the well heads at the parking lot. The direct impact on approximately 6 acres of central dune scrub sensitive natural community during operations and maintenance activities at the CEMEX slant wells under the proposed project is avoided under Alternative 1. Indirect impacts on central dune scrub sensitive natural community, which borders the Potrero Road slant well site, would be less severe than operations and maintenance activities at the CEMEX mining facility under the proposed project. Impacts on primary habitat at the CEMEX mining facility during operations and maintenance are avoided under Alternative 1 as compared with the proposed project. Operations and maintenance of the Alternative 1 subsurface slant wells at Potrero Road could result in indirect impacts on vegetation communities or features designated as ESHA under the North County LCP/LUP; however, potential impacts would be less severe than under the proposed project. Similar indirect impacts on western snowy plover critical habitat would occur during operations and maintenance under Alternative 1 as the proposed project. Additional indirect impacts on Monterey spineflower critical habitat would occur during operations and maintenance under Alternative 1 slant wells at Potrero Road as compared to the proposed project.

Alternative 1 would also avoid the proposed project’s impacts on steelhead habitat in the Salinas River and Tembladero Slough, but instead may affect steelhead habitat in Elkhorn Slough. As described in Section 5.5.4, the slant wells at Potrero Road could draw in groundwater that would otherwise flow to recharge the slough or draw surface water directly from the slough. The modeling cannot predict the amount of water diverted from Elkhorn Slough although it must be conservatively assumed, based on the predicted areal extent of the drawdown, that operations could potentially adversely affect steelhead habitat in Elkhorn Slough due to reduced surface water flow and volumes. This would be an increased level of impact compared to the proposed project and because there is no method to mitigate for impacts on surface water flow and volumes in Elkhorn Slough, Alternative 1 would result in an ***increased impact conclusion*** with respect to riparian habitat, critical habitat, or other sensitive natural communities compared to the proposed project, significant and unavoidable.

Under Alternative 1, no maintenance would occur near the CEMEX settling ponds; however, operations and maintenance of subsurface slant wells at Potrero Road have some potential to cause runoff or sediment discharge to nearby Old Salinas River and associated tidal salt marsh. Implementation of **Mitigation Measures 4.6-1a** through **4.6-1c** would reduce these potential impacts to less than significant. No impact on waters of the U.S./waters of the State would result from maintenance and operation of all other facilities. Therefore, Alternative 1 would result in the ***same impact conclusion*** with respect to wetlands and other waters during operation, less than significant with mitigation.

Alternative 1 would avoid impacts of the proposed project on the spread of invasive plants during operation because no maintenance would occur at the CEMEX site, and the Potrero Road site is disturbed and thus not susceptible to the spread of invasive plants. Maintenance and operations of all other facilities would not result in foreseeable surface disturbance which could contribute to the introduction or spread of invasive plants and would therefore have no impact. Therefore, Alternative 1 would result in a ***reduced impact conclusion*** with respect the spread of invasive plants during operation, no impact.

Alternative 1 would have the same impact related to inconsistency with an adopted habitat conservation plan because all facilities contributing to this impact would be common with the proposed project. Implementation of **Mitigation Measures 4.6-1a, 4.6-1n**, and **4.6-2b** would reduce the impact to a less-than-significant level. Therefore, with respect to consistency with an adopted habitat conservation plan, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Cumulative Analysis

Alternative 1 would have no foreseeable operational potential to spread invasive plants, and so would not contribute to cumulative impacts related to invasive plants during operation.

The geographic scope of analysis for cumulative impacts related to terrestrial biological resources for Alternative 1 is defined by the location of the Alternative 1 components as well as biologically linked terrestrial areas within approximately 5 miles of these sites, and is the same as that described for the proposed project in Section 4.6.6, with the exception of the different location of the intake system (Potrero Road, instead of CEMEX), and alternative source water pipeline route. Cumulative impacts, and the contribution of Alternative 1 to those impacts, within former Fort Ord lands and on migrating waterfowl would be exactly the same as described for the proposed project because the components that contribute to these impacts are the same under Alternative 1.

With respect to cumulative impacts on western snowy plover, Smith's blue butterfly, and sensitive dune scrub habitat, the location of subsurface slant wells at the Potrero Road parking lot would reduce Alternative 1 construction-related impacts compared to the proposed project because the Potrero Road parking lot location is disturbed and does not contain habitat or sensitive natural communities. Therefore, locating the subsurface slant wells at the Potrero Road parking lot would reduce potential direct and indirect impacts on western snowy plover, Smith's blue butterfly, and sensitive central dune scrub habitat and the potential to spread invasive species during construction and maintenance. The same cumulative projects listed in Section 4.6.6 would contribute to potential impacts on western snowy plover, Smith's blue butterfly, and sensitive vegetation types and wildlife habitat, including projects near the Potrero Road site (e.g., the Moss Landing Community Plan). In combination, these projects would result in significant cumulative impacts due to the potential to adversely affect western snowy plover, Smith's blue butterfly, and their habitat through heavy equipment use, dust generation, elevated noise levels, and increased human activity. Although it would reduce impacts on western snowy plover and Smith's blue butterfly, given the sensitivity of these species, and given the potential to affect other special-status species listed above, Alternative 1 could result in a significant contribution to cumulative impacts on special-status species and sensitive habitat types. The impacts of Alternative 1 would be mitigated consistent with what is described for the proposed project in Section 4.6.5 (**Mitigation Measures 4.6-1a** through **4.6-1q**, **4.6-2**), and therefore, for the same reasons described in Section 4.6.6, Alternative 1's contribution to cumulative impacts on these biological resources, would be less than significant with mitigation.

Construction of Alternative 1 would reduce impacts on wetlands by avoiding the CEMEX settling ponds, but disturbance at the Potrero Road site and components that are common with the proposed project could result in significant impacts. Thus, with the exception of avoiding the CEMEX settling ponds, the contribution of Alternative 1 to cumulative impacts on wetlands would be the same as described for the proposed project. As a result, the same projects listed in Section 4.6.6 would contribute to potential impacts on wetlands and other waters, potentially resulting in a significant cumulative impact. Alternative 1 components that are common with the proposed project could have a significant cumulative impact on wetlands in the region, as described in Section 4.6.6. After implementation of mitigation measures identified for the proposed project (i.e., **Mitigation Measures 4.6-1a**, **4.6-1b, 4.6-1c**, and **4.6-3**), Alternative 1 would have a less than significant cumulative impact on wetlands for the same reasons described in Section 4.6.6.

Alternative 1 would avoid construction within the primary habitat at the CEMEX site. However, similar to the proposed project, the desalinated water pipeline and transmission main under Alternative 1 would be constructed within primary habitat in the City of Marina and would conflict with the City of Marina LCLUP policies. Additionally, Alternative 1 would have a significant and unavoidable impact related to placing structures within or adjacent to habitat that is inconsistent with the North County LCP/LUP. The DeepWater Desal Project (No. 34 in **Table 4.1-2** in Section 4.1) could place its proposed desalination plant within or adjacent to habitat considered to be ESHA under the North County LCP/LUP, and would conflict with North County LCP/LUP policies, also a significant and unavoidable impact. In combination, these projects would result in a significant cumulative impact, and Alternative 1's contribution wouldbe significant.

Overall, while some contributions to cumulative impacts would be avoided or reduced, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, significant and unavoidable.

5.5.6.5 Direct and Indirect Effects of Project Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to Castroville Community Services District would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**). Therefore, the analysis of Alternative 2 on terrestrial biological resources focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 2.

Construction Impacts

With respect to effects on special-status species and their habitat, by eliminating onshore construction and maintenance activities and structures associated with the subsurface slant wells, Alternative 2 would avoid disturbance of 9 acres of central dune scrub habitat that would occur under the proposed project, eliminating impacts on western snowy plover and reducing overall impacts on special-status species and their habitat. Mitigation for impacts on snowy plover (**Mitigation Measure 4.6-1d**) would not be needed. Construction of the Alternative 2 intake would not have the potential for indirect impacts on sensitive habitats, as none are located adjacent to sites where construction of the intake would occur. Alternative 2 would reduce impacts on special-status species and their habitat compared to the proposed project, but would still result in significant impacts as a result of the components common with the proposed project. Implementation of **Mitigation Measures 4.6-1a** through **4.6-1c**, **4.6-1e** through **4.6-1p**, and **4.14-2** would reduce these impacts to less than significant.

Additionally, construction of the Alternative 2 source water pipeline north of Charles Benson Road could result in significant impacts at multiple river and tidal slough crossings and associated wetlands, including an additional separate pipeline crossing of Tembladero Slough at Molera Road, and of Old Salinas River at Potrero Road, and wetlands adjacent to the pipeline route. Although not anticipated, there is potential for frac-outs to occur using HDD. If a frac-out occurs, bentonite slurry could be released into the Tembladero Slough, which could degrade water quality and adversely impact steelhead habitat and/or individual fish by increasing suspended sediments that may inhibit fish respiration and degrade habitat, a significant impact. Implementation of **Mitigation Measure 4.6-1q (Frac-out Contingency Plan)** would reduce this impact to less than significant.

The Alternative 2 source water pipeline alignment provides lower habitat value for special-status plant and animal species in comparison with the proposed project's Source Water Pipeline alignment, therefore impacts on special-status plants and animals would be less severe; nonetheless, identified mitigation measures for construction would be required. All other components and potential impacts under Alternative 2 would be the same as in the proposed project. Thus, with respect to adverse effects on special-status species, although impacts would be decreased compared to the proposed project, combining the impacts of the proposed project components with the addition of 5.5 miles of source water pipeline, construction would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

With respect to effects on riparian habitat, critical habitat, and other sensitive natural communities, Alternative 2 would reduce the amount of impact on designated critical habitat and ESHA compared to the proposed project construction at the CEMEX slant well site by using industrial land on Dolan Road that is not adjacent to sensitive habitats. The Alternative 2 source water pipeline would have less severe impacts on central dune scrub than the MPWSP Source Water Pipeline and impacts on northern coastal scrub and riparian woodland and scrub sensitive natural communities similar to the Castroville Pipeline. Alternative 2 would avoid impacts on western snowy plover critical habitat. All other components and potential impacts under Alternative 2 would be the same as in the proposed project, and could be reduced to less than significant through implementation of **Mitigation Measures 4.6-1a** through **4.6-1c**, **4.6-1e**, **4.6-1n**, **4.6-1o**, **4.6-1p**, **4.6-2a**, and **4.6-2b**. Thus, with respect to riparian habitat, critical habitat, and sensitive natural communities, although impacts would be reduced compared to the proposed project, combining the impacts of the proposed project components with the addition of 5.5 miles of source water pipeline, construction would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Alternative 2 would increase the potential for significant construction impacts on wetlands with multiple crossings of open water features and associated wetlands, but could avoid or minimize those significant impacts through the use of trenchless construction methods and implementation of mitigation measures identified for the proposed project in Section 4.6 (**Mitigation Measures 4.6-1a** through **4.6-1c**, **4.6-1g**, and **4.6-3**), which would reduce these impacts to less than significant. Additionally, the open water intake structure would be constructed on the seafloor in waters of the U.S. and of the State, resulting in discharge of fill material over an estimated 3,300 ft^2 (0.07 acre), a significant impact that would be reduced to less than signfiicant with implementation of **Mitigation Measure 4.6-3**. Therefore, with respect to wetlands, combining the impacts of the proposed project components with the addition of 5.5 miles of source water pipeline and open water intake, although the potential for significant impacts would increase, construction would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Alternative 2 would avoid slant well construction within primary habitat at the CEMEX site. However, similar to the proposed project, the desalinated water pipeline and transmission main under Alternative 2 would be constructed within primary habitat in the City of Marina and would conflict with the city of Marina LCLUP policies. No mitigation is available to reduce this impact to a less-than-significant level. The Alternative 2 source water pipeline between Charles Benson Road and north of the Moro Cojo Slough would traverse agricultural lands without tree cover, and no impact on trees or conflict with local tree ordinances is expected to occur. All other facilities common with the proposed project have the potential to conflict with a local tree ordinance, either by requiring removal or resulting in injury to a protected tree, which would be a significant impact. This significant impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.6-4** (**Compliance with Local Tree Ordinances**). Therefore, although the impact of construction within primary habitat would be reduced, Alternative 2 would result in ***the same impact conclusion*** as the proposed project, significant and unavoidable, due to the impact related to conflict with the City of Marina LCLUP policy.

Eliminating the subsurface slant wells at CEMEX would decrease the potential for slant well construction to spread invasive species within central dune scrub, but the additional 5.5 miles of source water pipeline under Alternative 2 would increase the potential for pipeline construction to introduce or spread an invasive non-native species. This significant impact could be avoided or minimized to less than significant through implementation of **Mitigation Measures 4.6-1a** and **4.6-1p**. Thus, with respect to invasive species, combining the impacts of the proposed project components with the addition of 5.5 miles of source water pipeline, construction would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

With respect to operational impacts on special-status species and their habitat, eliminating the need for recurring maintenance of slant wells within or adjacent to sensitive central dune scrub habitat would eliminate operational impacts on this habitat type and associated special-status species. Maintenance of the new intake pump station would occur within areas that would be developed and disturbed as part of construction, which are located among already disturbed industrial areas on Dolan Road. Nearby habitat consists of ruderal vegetation, coyote brush, and non-native trees that do not provide high quality habitat for sensitive species (e.g., western snowy plover). Operation of Alternative 2 would eliminate impacts on western snowy plover as they do not occupy this area; therefore, the need for mitigation of those impacts, as described in the proposed project, would also be eliminated. Noise generated during operation of the intake pump station would have a less severe impact on special-status species than the subsurface slant wells under the proposed project. Therefore, with respect to impacts on special-status species, combining the proposed project components with those unique to Alternative 2, operation would result in a reduced impact, compared to the proposed project, due to the lower habitat value where sensitive species are less likely to occur, but would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

With respect to operational impacts on riparian habitat, critical habitat, or other sensitive natural communities, Alternative 2 would avoid the proposed project's impacts on steelhead habitat in the Salinas River and Tembladero Slough because it would not draw groundwater that could affect surface water flows, and would avoid maintenance-related impacts within snowy plover critical habitat and central dune scrub, a sensitive natural community, and primary habitat under the City of Marina LCLUP. Construction of other components would result in similar impacts on vegetation communities designated as primary habitat or ESHA under LCPs as the proposed project. Operation and maintenance of the intake pump station and source water pipeline would have similar impacts to those described for the proposed project and could be significant, but impacts would be reduced to a less-than-significant level with implementation of **Mitigation**

Measures 4.6-1a, **4.6-1b**, **4.6-1c**, **4.6-1n**, **4.6-1p**, **4.6-2a**, and **4.6-2b**. Therefore, although it would greatly reduce impacts on critical habitat and other sensitive natural communities compared to the proposed project, Alternative 2 would result in the ***same impact conclusion*** with respect to riparian habitat, critical habitat, or other sensitive natural communities compared to the proposed project, less than significant with mitigation.

Under Alternative 2, operation and maintenance of the new open water intake at Moss Landing would not result in any potential impacts on jurisdictional wetlands or waters. No impact on waters of the U.S./waters of the State would result from maintenance and operation of all other facilities. Therefore, Alternative 2 would result in a ***reduced impact conclusion*** with respect to wetlands and other waters during operation, no impact.

Alternative 2 would avoid impacts of the proposed project on the spread of invasive plants during operation because no maintenance would occur at the CEMEX site. Maintenance and operations of all other facilities would not result in foreseeable surface disturbance that could contribute to the introduction or spread of invasive plants and would have no impact. Therefore, Alternative 2 would result in a ***reduced impact conclusion*** with respect the spread of invasive plants during operation, no impact.

With respect to inconsistency with an adopted habitat conservation plan, Alternative 2 would have the same impact related to inconsistency with an adopted habitat conservation plan because all facilities contributing to this impact would be common with the proposed project. Implementation of **Mitigation Measures 4.6-1a, 4.6-1n**, and **4.6-2b** would reduce the impact to a less-than-significant level. Therefore, with respect to consistency with an adopted habitat conservation plan, Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Cumulative Analysis

Alternative 2 would have no impact on wetlands or other waters during operation and no foreseeable operational potential to spread invasive plants; therefore, unlike the proposed project, it would avoid contributions to cumulative impacts on these resources.

The geographic scope of analysis for cumulative impacts related to terrestrial biological resources for Alternative 2 is defined by the location of the Alternative 2 components, as well as biologically linked terrestrial areas within approximately 5 miles of these sites, and is the same as that described for the proposed project in Section 4.6.6, with the exception that the Castroville Pipeline and Pipeline to CSIP are not included, as well as the different location of the open water intake system and alternative source water pipeline. Cumulative impacts, and the contribution of Alternative 2 to those impacts, within former Fort Ord lands and on migrating waterfowl would be exactly the same as described for the proposed project because the components that contribute to these impacts are the same under Alternative 2.

Eliminating disturbance associated with the subsurface slant wells at the CEMEX site would eliminate impacts on western snowy plover and reduce overall impacts on special-status species and their habitat and the potential to spread invasive species within sensitive dune scrub habitat compared to the proposed project. The same projects listed in Section 4.6.6 would contribute to potential impacts on sensitive vegetation types and wildlife habitat that could be affected by Alternative 2 components, including projects near the intake location (e.g., the Moss Landing Community Plan). In combination, these projects would result in significant cumulative impacts due to the potential to adversely affect special-status species and sensitive habitat types. Given the potential to adversely affect special-status species, Alternative 2 could result in a significant contribution to significant cumulative impacts on special-status species and sensitive habitat types. These impacts would be mitigated consistent with what is described for the proposed project in Section 4.6.5 (**Mitigation Measures 4.6-1a** through **4.6-1q**, **4.6-2**), and therefore, for the same reasons described in Section 4.6.6, Alternative 2's contribution and the overall cumulative impact would be reduced to a level that is less than significant.

Construction of Alternative 2 would have potentially significant impacts on wetlands as a result of multiple river and tidal slough crossings and associated wetlands. Additionally, components that are common with the proposed project could result in significant impacts as described in Section 4.6.5. The same projects listed in Section 4.6.6 would contribute to potential impacts on wetlands and other waters, potentially resulting in a significant cumulative impact. Alternative 2 river and tidal slough crossings, along with components common with the proposed project, could have a significant contribution to cumulative impacts on wetlands in the region. After implementation of mitigation measures identified for the proposed project (i.e., **Mitigation Measures 4.6-1a, 4.6-1b, 4.6-1c,** and **4.6-3**), Alternative 2 would result in a less than significant cumulative impact on wetlands for the same reasons described in Section 4.6.6.

Alternative 2 would avoid construction within primary habitat at the CEMEX site. However, similar to the proposed project, the desalinated water pipeline and transmission main under Alternative 2 would be constructed within primary habitat in the City of Marina and would conflict with the City of Marina LCLUP policies. The DeepWater Desal Project (No. 34 in **Table 4.1-2** in Section 4.1) could place its proposed desalination plant within or adjacent to habitat considered to be ESHA under the North County LCP/LUP, and would conflict with North County LCP/LUP policies, also a significant and unavoidable impact. In combination, these projects would result in a significant cumulative impact, and Alternative 2's contribution would be significant and unavoidable.

Overall, although the impact related to the conflict with the City of Marina LCLUP policies would be reduced compared to the proposed project, Alternative 2 would result in the ***same impact conclusion*** as the proposed project, significant and unavoidable.

5.5.6.6 Direct and Indirect Effects of Alternative 3 - Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The pipelines for the intake and discharge systems would be installed using HDD. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-3**, ASR 5 and 6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water that originated from the Salinas Valley Groundwater Basin, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**). Therefore, the analysis of Alternative 3 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 3.

Construction Impacts

With respect to effects on special-status species and their habitat, by eliminating onshore construction and maintenance activities and structures associated with the subsurface slant wells, Alternative 3 would avoid disturbance of 9 acres of central dune scrub habitat that would occur under the proposed project, eliminating impacts on western snowy plover and reducing overall impacts on special-status species and their habitat. However, Alternative 3 would result in potentially greater significant impacts (up to 91 acres) on habitat that could support other special-status animal species, including California tiger salamander and California red-legged frog breeding and dispersal or refugia, Santa Cruz long-toed salamander, burrowing owl, nesting birds, and American badger, as well as special-status plants. Additionally, the desalination plant could indirectly reduce the habitat value of adjacent or nearby aquatic breeding habitats by reducing the the availability of upland aestivation sites and restricting migration. Construction of the new open-water intake and brine discharge outfall at Moss Landing would have negligible impacts on terrestrial biological resources, if any, because construction on land would be limited to a small parcel of already disturbed land.

The new desalinated water pipeline between the desalination plant and the "Connection to CalAm" point could result in the same impacts described above for these components of Alternative, 2 with potential for significant impacts on steelhead habitat and/or individual fish if a frac-out occurs using HDD. The Alternative 3 desalinated water pipeline alignment provides lower habitat value for special-status plant and animal species in comparison with the proposed project's Source Water Pipeline alignment, resulting in a less severe impact on special-status plants and animals; nonetheless, identified mitigation measures for construction would be required. The addition of approximately 25 miles of desalinated water pipelines to serve other areas likely would result in impacts similar to the desalinated water pipeline; however, alignments are not currently known. All other components and potential impacts on special-status species under Alternative 3 would be the same as in the proposed project.

In comparison with the proposed project, the potentially significant impact on special-status species during construction would be increased but could be reduced to less than significant by implementation of the same mitigation measures identified for the proposed project in Section 4.6. Implementation of **Mitigation Measures 4.6-1a** through **4.6-1c**, **4.6-1e** through **4.6-1q**, and **4.14-2** identified for the proposed project in Section 4.6 would reduce these impacts on special-status species and their habitat to less than significant. Thus, with respect to adverse effects on special-status species, although impacts would be increased compared to the proposed project, construction would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

With respect to effects on riparian habitat, critical habitat, and other sensitive natural communities, Alternative 3 would avoid approximately 9 acres of central dune scrub sensitive natural community and primary habitat under the City of Marina LCLUP, and indirect impacts on snowy plover critical habitat at the CEMEX site. However, construction of the Alternative 3 desalination facility, source water pipeline, and outfall pipeline would occur within or adjacent to vegetation communities or features considered ESHA under the North County LCP. The potential impacts on sensitive natural communities along Dolan Road could be significant and unavoidable even with implementation of **Mitigation Measures 4.6-2a** and **4.6-2b**. Construction of other components would result in similar impacts on vegetation communities designated as primary habitat or ESHA under LCPs as the proposed project. Thus, with respect to riparian habitat, critical habitat, and sensitive natural communities, construction would result in an ***increased impact conclusion*** compared to the proposed project, significant and unavoidable.

Alternative 3 would increase the potential for significant construction impacts on wetlands with multiple crossings of open water features and associated wetlands as described above for Alternative 2. Additionally, construction impacts would be greater than the proposed project, mainly due to location of the intake and brine discharge structures on the seafloor in comparison with the use of subsurface slant wells. The open water intake structure and brine discharge structure would be constructed on the seafloor in waters of the U.S. and of the State, resulting in discharge of fill material over approximately 16,700 ft^2 (0.4 acre). Installation of the intake and brine discharge pipelines would result in disturbance-related impacts within waters of the U.S. at their point of emergence from the seafloor. Installation of the pipelines within Dolan Road could result in additional impacts on wetlands and other waters located on either side of the roadway as a result of runoff from active construction sites. Construction of Alternative 3 could result in an unspecified amount of impacts on seasonal freshwater wetlands in the northwest corner of Moss Landing Power Plant East Parcel through direct fill. Implementation of **Mitigation Measures 4.6-1a**, **4.6-1b**, **4.6-1c**, and **4.6-3** would reduce impacts to a less-than-significant level. Therefore, with respect to wetlands, although the extent of impacts would increase, Alternative 3 construction would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Alternative 3 would avoid slant well construction within primary habitat at the CEMEX site. However, similar to the proposed project the desalinated water pipeline and transmission main under Alternative 3 would be constructed within primary habitat in the City of Marina. The City of Marina LCLUP prohibits development in primary habitat that is not protective of and dependent upon that resource. Therefore, construction of the desalinated water pipeline and transmission main would conflict with the City of Marina LCLUP policies. Alternative 3 would result in the development of the intake and discharge pipelines under the Old Salinas River (also called the Moss Landing Harbor in that location) (see **Figure 5.4-3**, inset). This development could conflict with Policy 2.3.3.B4 of the North County LCP/LUP, which requires a setback of 100 feet from the landward edge of vegetation of all coastal wetlands (such as those present along the Old Salinas River) to be provided and maintained in open space use, and requires that no permanent structures except for those necessary for resource-dependent use which cannot be located elsewhere can be constructed in the setback area. Prior to approval of all proposed structures in the setback area, it must be demonstrated that the development does not significantly disrupt the habitat resource. Because the intake and discharge pipelines are not a resource-dependent use, they would conflict with this policy. No mitigation is available to reduce this impact to a less-than-significant level. The Alternative 3 desalinated water pipeline between Charles Benson Road and north of the Moro Cojo Slough would traverse agricultural lands without tree cover, and no impact on trees or conflict with local tree ordinances is expected to occur. All other facilities common with the proposed project have the potential to conflict with a local tree ordinance, either by requiring removal or resulting in injury to a protected tree, which would be a significant impact. This significant impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.6-4** (**Compliance with Local Tree Ordinances**). Overall, Alternative 4 would result in the ***same impact conclusion*** as the proposed project, significant and unavoidable.

Eliminating the subsurface slant wells at CEMEX would decrease the potential for slant well construction to spread invasive species within central dune scrub, but the longer desalinated water pipeline under Alternative 3 would increase the potential for pipeline construction to introduce or spread an invasive non-native species. This significant impact could be avoided or minimized to less than significant through implementation of **Mitigation Measures 4.6-1a** and **4.6-1p**. Thus, with respect to invasive species, combining the impacts of the proposed project components with the longer pipeline, construction would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

With respect to operational impacts on special-status species and their habitat, eliminating the need for recurring maintenance of slant wells within or adjacent to sensitive central dune scrub habitat would eliminate operational impacts on this habitat type and associated special-status species. Maintenance of the new intake pump station would occur within already-developed and disturbed industrial areas on Dolan Road. Operation of Alternative 3 would eliminate impacts on western snowy plover; therefore, the need for mitigation of those impacts, as described in the proposed project, would also be eliminated. Noise generated during operation of the intake pump station would have a less severe impact on special-status species than the subsurface slant wells under the proposed project. Impacts on waterfowl associated with operation and maintenance activities at the MPWSP Desalination Plant brine storage tank are avoided under Alternative 3. Therefore, with respect to impacts on special-status species, combining the proposed project components with those unique to Alternative 3, operation would result in a reduced impact, but would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

With respect to operational impacts on riparian habitat, critical habitat, or other sensitive natural communities, Alternative 3 would avoid the proposed project's impacts on steelhead habitat in the Salinas River and Tembladero Slough because it would not draw groundwater that could affect surface water flows, and would avoid maintenance-related impacts within snowy plover critical habitat and central dune scrub, a sensitive natural community, and primary habitat under the City of Marina LCLUP. Construction of the Alternative 3 desalination facility, source water pipeline, outfall pipeline, and ASR pipelines would occur within or adjacent to vegetation communities or features considered ESHA under the North County LCP/LUP. Operation and maintenance of the intake pump station would have similar impacts to those described for the proposed project and could be significant. All impacts would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.6-1a**, **4.6-1b**, **4.6-1c**, **4.6-1n**, **4.6-1p**, **4.6-2a**, and **4.6-2b**. Therefore, Alternative 3 would result in the ***same impact conclusion*** with respect to riparian habitat, critical habitat, or other sensitive natural communities compared to the proposed project, less than significant with mitigation.

Operation and maintenance of the new open water intake and brine discharge outfall at Moss Landing would not result in any potential impacts on jurisdictional wetlands or waters. Operation and maintenance of the new desalination plant at Moss Landing Power Plant East Parcel could result in runoff and sediment discharge impacts on seasonal freshwater wetlands in the northwest corner of the parcel and to a drainage parallel to Dolan Road. Implementation of **Mitigation Measures 4.6-1a** through **4.6-1c** would reduce these potential impacts to less than significant. No impact on waters of the U.S./waters of the State would result from maintenance and operation of all other facilities. Therefore, Alternative 3 would result in the ***same impact conclusion*** with respect to wetlands and other waters during operation, less than significant with mitigation.

Alternative 3 would avoid impacts of the proposed project on the spread of invasive plants during operation because no maintenance would occur at the CEMEX site. Maintenance and operations of all other facilities would not result in foreseeable surface disturbance which could contribute to the introduction or spread of invasive plants and would therefore have no impact. Therefore, Alternative 3 would result in a ***reduced impact conclusion*** with respect the spread of invasive plants during operation, no impact.

With respect to inconsistency with an adopted habitat conservation plan, Alternative 3 would have the same impact as the proposed project because all facilities contributing to this impact would be common with the proposed project. Implementation of **Mitigation Measures 4.6-1a, 4.6-1n**, and **4.6-2b**would reduce the impact to a less-than-significant level. Therefore, with respect to consistency with an adopted habitat conservation plan, Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Cumulative Analysis

Alternative 3 would avoid the effects of the proposed project on migrating waterfowl, and would have no foreseeable operational potential to spread invasive plants; therefore, unlike the proposed project, it would avoid contributions to cumulative impacts on these resources.

The geographic scope of analysis for cumulative impacts related to terrestrial biological resources for Alternative 3 is defined by the location of the Alternative 3 components as well as biologically linked terrestrial areas within approximately 5 miles of these sites. Cumulative impacts within former Fort Ord lands, and the contribution of Alternative 3 to those impacts, would be exactly the same as described for the proposed project because the components that contribute to these impacts are the same under Alternative 3.

Eliminating disturbance associated with the subsurface slant wells at the CEMEX site would eliminate impacts on western snowy plover and reduce overall impacts on special-status species and their habitat and the potential to spread invasive species within sensitive dune scrub habitat compared to the proposed project. The same projects listed in Section 4.6.6 would contribute to potential impacts on sensitive vegetation types and wildlife habitat that could be affected by Alternative 3 components, including projects near the intake and desalination plant location (e.g., the Moss Landing Community Plan). In combination, these projects would result in significant cumulative impacts due to the potential to adversely affect special-status species and sensitive habitat types. Given the potential to adversely affect special-status species, Alternative 3's contribution to cumulative impacts on special-status species and sensitive habitat types would be significant. These impacts would be mitigated consistent with what is described for the proposed project in Section 4.6.5 (**Mitigation Measures 4.6-1a** through **4.6-1q**, **4.6-2**), and therefore, for the same reasons described in Section 4.6.6, while Alternative 3 could result in a significant cumulative impact on these biological resources, with mitigation, its contribution would be reduced to a level that is less than significant.

Construction of Alternative 3 would have potentially significant impacts on wetlands as a result of multiple river and tidal slough crossings and associated wetlands. Additionally, components that are common with the proposed project could result in significant impacts as described in Section 4.6.5. The same projects listed in Section 4.6.6 would contribute to potential impacts on wetlands and other waters, potentially resulting in a significant cumulative impact. Alternative 3 river and tidal slough crossings, along with components common with the proposed project, could have a significant contribution to cumulative impacts on wetlands in the region. After implementation of mitigation measures identified for the proposed project (i.e., **Mitigation Measures 4.6-1a, 4.6-1b, 4.6-1c,** and **4.6-3**), Alternative 3's incremental contribution to cumulative impacts on wetlands would be less than significant for the same reasons described in Section 4.6.6.

Alternative 3 would avoid construction within the primary habitat at the CEMEX site. However, similar to the proposed project, the desalinated water pipeline and transmission main under Alternative 3 would be constructed within primary habitat in the City of Marina and would conflict with the City of Marina LCLUP policies. Additionally, Alternative 3 would have a significant and unavoidable impact related to placing structures within or adjacent to habitat that is inconsistent with the North County LCP/LUP. Alternative 3 is the only reasonably foreseeable project in **Table 4.1-2** in Section 4.1 that would place structures within or adjacent to habitat considered to be ESHA under the Marina LCLUP and North County LCP/LUP policies; therefore, a cumulative impact analysis is not relevant to this impact.

Overall, Alternative 3 would result in a ***reduced impact conclusion*** compared to the proposed project, less than significant with mitigation.

5.5.6.7 Direct and Indirect Effects of Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**). Therefore, the analysis of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4.

Construction Impacts

With respect to effects on special-status species and their habitat, by eliminating onshore construction and maintenance activities and structures associated with the subsurface slant wells, Alternative 4 would avoid disturbance of 9 acres of central dune scrub habitat that would occur under the proposed project, eliminating impacts on western snowy plover and reducing overall impacts on special-status species and their habitat. Construction of the new open-water intake and brine discharge pipelines at Moss Landing and new alternative source water pipeline would have neglible impacts on terrestrial biological resources, if any, because construction on land would be limited to an existing 20-foot-diameter intake pump caisson structure located on the beach; Alternative 4 would avoid proposed project impacts on special-status plants and animals known to occur or with potential to occur at the subsurface slant well site and along the Source Water Pipeline; and impacts on special-status plants and animals at the MPWSP Desalination Plant, Brine Discharge Pipeline, and Pipeline to CSIP Pond. As described for Alternative 3, the Alterntive 4 desalinated water pipeline alignment provides lower habitat value for special-status plant and animal species in comparison with the proposed project's Source Water Pipeline alignment, resulting in a less severe impact on special-status plants and animals; nonetheless, construction activities could still result in direct or indirect impacts, which would be potentially significant, and identified mitigation measures for construction would be required. Implementation of **Mitigation Measures 4.6-1a** through **4.6-1c**, **4.6-1e** through **4.6-1q,** and **4.14-2** identified for the proposed project in Section 4.6 would reduce these impacts on special-status species and their habitat to less than significant. Thus, with respect to adverse effects on special-status species, although impacts would be decreased compared to the proposed project, combining the impacts of the proposed project components with the components unique to Alternative 4, construction would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

With respect to effects on riparian habitat, critical habitat, and other sensitive natural communities, Alternative 4 would avoid approximately 9 acres of central dune scrub sensitive natural community and primary habitat under the City of Marina LCLUP, and indirect impacts on snowy plover critical habitat at the CEMEX site. However, the new alternative desalination plant would be situated adjacent to wetland sensitive habitat, consisting of saltmarsh wetlands connected to Moro Cojo Slough, with the potential for direct impacts from construction disturbance or runoff. This habitat also consitutes ESHA and under the North County LCP/LUP. However, Alternative 4 would not include facilities located within designated Critical Habitat, and overall impacts on sensitive habitats, including those on ESHA, would be decreased compared to the proposed project. Nonetheless, construction activities could still result in direct or indirect impacts, which would be potentially significant. Implementation of mitigation measures identified for the proposed project in Section 4.6 (i.e., **Mitigation Measures 4.6-1a** through **4.6-1c**, **4.6-1e** through **4.6-1q**, **4.12-1b**, and **4.14-2**) would reduce these impacts to less than significant. Thus, with respect to riparian habitat, critical habitat, and sensitive natural communities, construction would result in the ***same impact conclusion*** compared to the proposed project, less than significant with mitigation.

Alternative 4 would increase the potential for significant construction impacts on wetlands with multiple crossings of open water features and associated wetlands as described above for Alternative 2. Additionally, construction impacts would be greater than the proposed project, mainly due to location of the intake and brine discharge structures on the seafloor in comparison with the use of subsurface slant wells. The open water intake structure and brine discharge structure would be constructed on the seafloor in waters of the U.S. and of the State, resulting in discharge of fill material over approximately 43,200 ft^2 (about 1 acre). Construction of the desalination plant at the former National Refractories facility could impact salt marsh wetlands located along the site's western margin, and connected to Moro Cojo Slough. Implementation of **Mitigation Measures 4.6-1a**, **4.6-1b**, **4.6-1c**, and **4.6-3** would reduce impacts to a less-than-significant level. Therefore, with respect to wetlands, although the extent of impacts would increase, Alternative 4 construction would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Alternative 4 would avoid slant well construction within primary habitat at the CEMEX site. However, similar to the proposed project, the Desalinated Water Pipeline and Transmission Main under Alternative 4 would be constructed within primary habitat in the City of Marina. The City of Marina LCLUP prohibits development in primary habitat that is not protective of and dependent upon that resource. Therefore, construction of the desalinated water pipeline and transmission main would conflict with the City of Marina LCLUP policies. Additionally, Alternative 4 would result in the development of the intake and discharge pipelines under the Old Salinas River (see **Figure 5.4-4**, inset). This development could conflict with Policy 2.3.3.B4 of the North County LCP/LUP, which requires a setback of 100 feet from the landward edge of vegetation of all coastal wetlands (such as those present along the Old Salinas River) to be provided and maintained in open space use, and requires that no permanent structures except for those necessary for resource-dependent use which cannot be located elsewhere can be constructed in the setback area. Prior to approval of all proposed structures in the setback area, it must be demonstrated that the development does not significantly disrupt the habitat resource. Because the intake and discharge pipelines are not a resource-dependent use, they would conflict with this policy. No mitigation is available to reduce this impact to a less-than-significant level. The Alternative 4 desalinated water pipeline between Charles Benson Road and north of the Moro Cojo Slough traverses agricultural lands without tree cover, and no impact on trees or conflict with local tree ordinances is expected to occur. All other facilities common with the proposed project have the potential to conflict with a local tree ordinance, either by requiring removal or resulting in injury to a protected tree, which would be a significant impact. This significant impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.6-4 (Compliance with Local Tree Ordinances)**. Overall, Alternative 4 would result in the ***same impact conclusion*** as the proposed project, significant and unavoidable.

Eliminating the subsurface slant wells at CEMEX would decrease the potential for slant well construction to spread invasive species within central dune scrub, but the longer desalinated water pipeline under Alternative 4 would increase the potential for pipeline construction to introduce or spread an invasive non-native species. This significant impact could be avoided or minimized to less than significant through implementation of **Mitigation Measures 4.6-1a** and **4.6-1p** (see Section 5.5.6.2 for the names of these mitigation measures). Thus, with respect to invasive species, combining the impacts of the proposed project components with the longer pipeline, construction would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

With respect to operational impacts on special-status species and their habitat, eliminating the need for recurring maintenance of slant wells within or adjacent to sensitive central dune scrub habitat would eliminate operational impacts on this habitat type and associated special-status species. Noise generated during operation of the intake pump station (see Section 5.5.12.7) would have a less severe impact on special-status species than the subsurface slant wells under the proposed project . Impacts on waterfowl associated with operation and maintenance activities at the MPWSP Desalination Plant brine storage tank are avoided under Alternative 4. Therefore, with respect to impacts on special-status species, combining the proposed project components with those unique to Alternative 4, operation would result in a reduced impact, but would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

With respect to operational impacts on riparian habitat, critical habitat, or other sensitive natural communities, Alternative 3 would avoid the proposed project's impacts on steelhead habitat in the Salinas River and Tembladero Slough because it would not draw groundwater that could affect surface water flows, and would avoid maintenance-related impacts within snowy plover critical habitat and central dune scrub, a sensitive natural community, and primary habitat under the City of Marina LCLUP. Additional indirect impacts on Monterey spineflower critical habitat could occur during operations and maintenance at the Alternative 4 intake facility at the existing beach caisson. Operations and maintenance of the Alternative 4 components, including the alternative source water pipeline, outfall pipeline, and components common with the proposed project would have similar potentially significant impacts on sensitive natural communities and critical habitat as the proposed project. All impacts would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.6-1a**, **4.6-1b**, **4.6-1c**, **4.6-1n**, **4.6-1p**,

4.6-2a, and **4.6-2b**. Therefore, Alternative 4 would result in the ***same impact conclusion*** with respect to riparian habitat, critical habitat, or other sensitive natural communities compared to the proposed project, less than significant with mitigation.

Operation and maintenance of the new open water intake and brine discharge outfall at Moss Landing would not result in any potential impacts on jurisdictional wetlands or waters in comparison to the proposed project. Operation of the desalination plant at the former National Refractories facility could impact salt marsh wetlands located along the site's western margin, and connected to Moro Cojo Slough, through runoff and sediment discharge. Implementation of **Mitigation Measures 4.6-1a** through **4.6-1c** would reduce these potential impacts to less than significant. No impact on waters of the U.S./waters of the State would result from maintenance and operation of all other facilities. Therefore, Alternative 4 would result in the ***same impact conclusion*** with respect to wetlands and other waters during operation, less than significant with mitigation.

Alternative 4 would avoid impacts of the proposed project on the spread of invasive plants during operation because no maintenance would occur at the CEMEX site. Maintenance and operations of all other facilities would not result in foreseeable surface disturbance that could contribute to the introduction or spread of invasive plants and would therefore have no impact. Therefore, Alternative 4 would result in a ***reduced impact conclusion*** with respect the spread of invasive plants during operation, no impact.

With respect to inconsistency with an adopted habitat conservation plan, the Alternative 4 would have the same impact as the proposed project because all facilities contributing to this impact (Transmission Main) would be common with the proposed project. Implementation of **Mitigation Measures 4.6-1a, 4.6-1n**, and **4.6-2b** would reduce the impact to a less-than-significant level. Therefore, with respect to consistency with an adopted habitat conservation plan, Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Cumulative Analysis

Alternative 4 would have no foreseeable operational potential to spread invasive plants, and so would not contribute to cumulative impacts related to invasive plants during operation.

The geographic scope of analysis for cumulative impacts related to terrestrial biological resources for Alternative 4 is defined by the location of the Alternative 4 components as well as biologically linked terrestrial areas within approximately 5 miles of these sites. Cumulative impacts within former Fort Ord lands, and the contribution of Alternative 4 to those impacts, would be exactly the same as described for the proposed project because the components that contribute to these impacts are the same under Alternative 4.

Eliminating disturbance associated with the subsurface slant wells at the CEMEX site would eliminate impacts on western snowy plover and reduce overall impacts on special-status species and their habitat and the potential to spread invasive species within sensitive dune scrub habitat compared to the proposed project. The same projects listed in Section 4.6.6 would contribute to potential impacts on sensitive vegetation types and wildlife habitat that could be affected by

Alternative 4 components, including projects near the intake and desalination plant location (e.g., the Moss Landing Community Plan). In combination, these projects would result in significant cumulative impacts due to the potential to adversely affect special-status species and sensitive habitat types. Given the potential to adversely affect special-status species, Alternative 4 could result in a cumulatively considerable contribution to significant cumulative impacts on special-status species and sensitive habitat types. These impacts would be mitigated consistent with what is described for the proposed project in Section 4.6.5 (**Mitigation Measures 4.6-1a** through **4.6-1q**, **4.6-2**), and therefore, for the same reasons described in Section 4.6.6, while Alternative 4 could result in a significant contribution to cumulative impacts on these biological resources, with mitigation, its contribution and the overall cumulative impacts would be reduced to a level that is less than significant.

Construction of Alternative 4 would have potentially significant impacts on wetlands as a result of multiple river and tidal slough crossings and associated wetlands. Additionally, components that are common with the proposed project could result in significant impacts as described in Section 4.6.5. The same projects listed in Section 4.6.6 would contribute to potential impacts on wetlands and other waters, potentially resulting in a significant cumulative impact. Alternative 4 river and tidal slough crossings, along with components common with the proposed project, could have a considerable contribution to significant cumulative impacts on wetlands in the region. After implementation of mitigation measures identified for the proposed project (i.e., **Mitigation Measures 4.6-1a, 4.6-1b, 4.6-1c,** and **4.6-3**), Alternative 4's contribution would result in a less than significant cumulative impact on wetlands for the same reasons described in Section 4.6.6.

Alternative 4 would avoid construction within the primary habitat at the CEMEX site. However, similar to the proposed project, the desalinated water pipeline and transmission main under Alternative 4 would be constructed within primary habitat in the City of Marina and would conflict with the City of Marina LCLUP policies. Additionally, Alternative 4 would have a significant and unavoidable impact related to placing structures within or adjacent to habitat that is inconsistent with the North County LCP/LUP. The DeepWater Desal Project (No. 34 in **Table 4.1-2** in Section 4.1) could place its proposed desalination plant within or adjacent to habitat considered to be ESHA under the North County LCP/LUP, and would conflict with North County LCP/LUP policies, also a significant and unavoidable impact. In combination, these projects would result in a significant cumulative impact, and Alternative 4's contribution would be significant and unavoidable.

Overall, while some contributions to cumulative impacts would be avoided, Alternative 4 would result in the ***same impact conclusion*** as the proposed project, significant and unavoidable.

5.5.6.8 Direct and Indirect Effects of Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as

Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction Impacts

Alternative 5a would reduce impacts on sensitive central dune scrub and associated special-status species compared to the proposed project by reducing the area of construction impact at the CEMEX site by approximately 15 percent. However, construction activities in proximity to endangered species habitat (i.e., western snowy plover, Smith's blue butterfly, and others described in Section 4.6) would result in similar levels of potential direct and indirect effects on individuals and habitat quality compared with the project. Alternative 5b would result in construction of fewer subsurface slant wells at Potrero Road compared to Alternative 1, but would have the same area of disturbance, and so would result in the same types of impacts described for Alternative 1. Under both Alternatives 5a and 5b, the area of disturbance of California annual grassland and associated special-status species, including California tiger salamander, at the desalination plant site may be reduced, but potential significant impacts on special-status species would be the same as the proposed project. All other components and potential impacts under Alternatives 5a and 5b would be the same as in the proposed project and Alternative 1, respectively. Thus, although impacts would be reduced compared to the proposed project because of the smaller area of disturbance, construction would result in the ***same impact conclusion*** with respect to adverse effects on special-status species as the proposed project, less than significant with mitigation.

With respect to effects on riparian habitat, critical habitat, and other sensitive natural communities, Alternative 5a would reduce the area of sensitive central dune scrub disturbance, but potential significant impacts on central dune scrub sensitive natural community, primary habitat under the Marina LCP, and western snowy plover critical habitat would be the same. Alternative 5b impacts on sensitive natural communities would be the same as described under Alternative 1. Overall, Alternative 5b would have less severe significant impacts on sensitive natural communities and similar significant impacts on critical habitat compared to the proposed project. With respect to riparian habitat, critical habitat, and sensitive natural communities, construction of Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

The same impacts on jurisdictional wetlands and other waters would occur during construction of Alternative 5a as under the proposed project. Construction impacts resulting from Alternative 5b would result in greater potential impacts on jurisdictional wetlands and other waters associated with multiple crossings of jurisdictional features by the new alternative source water pipeline. **Mitigation Measures 4.6-1a** through **4.6-1c, 4.6-1g,** and **4.6-3** would be relevant to both Alternatives 5a and 5b. Construction would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Alternative 5a would result in the same significant unavoidable impact from conflict with the Marina LCLUP as the proposed project, and Alternative 5b would result in the same significant unavoidable impact from conflict with the Marina LCLUP and the North County LCP/LUP as

Alternative 1. Therefore, Therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project, significant and unavoidable.

Less ground disturbance would occur at the desalination plant site under Alternatives 5a and 5b than under the proposed project and therefore the potential impact resulting from the spread of non-native, invasive species at this site would be less. Alternative 5b would include a longer source water pipeline as described for Alternative 1, increasing the potential to spread invasive species along that alignment compared to the proposed project or Alternative 5a. Impacts would be significant and would require implementation of **Mitigation Measure 4.6-1p** (**Control Measures for Spread of Invasive Plants**) to reduce impacts to less than significant. Thus, with respect to invasive species, construction would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

With respect to operational impacts on special-status species and their habitat, operation of the pumping wells (from both Alternative 5a and 5b) would not produce groundborne vibration and therefore, there would be no impacts on special-status species from vibration. This is the same as described for the proposed project and for Alternative 1. Disturbance from maintenance of the slant wells and the resulting impact on western snowy plover habitat would be similar to the proposed project under Alternative 5a (CEMEX site) and decreased compared to the proposed project under Alternative 5b (Potrero Road site); under either alternative, significant indirect impacts could still occur and would be reduced to less than significant with **Mitigation Measure 4.6-1d**. All other components would result in the same potentially significant impacts described for the proposed project, and thus would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

With respect to operational impacts on riparian habitat, critical habitat, or other sensitive natural communities, under Alternative 5a, similar impacts on central dune scrub sensitive natural community, primary habitat under the City of Marina LCLUP, and western snowy plover critical habitat would occur at the CEMEX facility subsurface slant wells and source water pipeline during operations and maintenance activities as the proposed project. The area of disturbance would be reduced under Alternative 5a but potential significant impacts on central dune scrub sensitive natural community, primary habitat under the City of Marina LCP, and western snowy plover critical habitat would be the same. Under Alternative 5b, impacts on sensitive natural communities during operations would be the same as described under Alternative 1, and would be potentially significant. Impacts of both Alternatives 5a and 5b would be mitigated to a less-than-significant level with implementation of **Mitigation Measures 4.6-1a** through **4.6-1d**, **4.6-1n**, **4.6-1p**, **4.6-2a**, and **4.6-2b**.

Alternative 5a would reduce impacts on steelhead habitat compared to the proposed project. Although slant well pumping under Alternative 5a would not directly pull surface water from the Salinas River, like the proposed project slant well pumping, it could draw in groundwater that would otherwise discharge to the river. Alternative 5a would remove less groundwater from the river recharge system compared to the proposed project – approximately 270 afy compared to the proposed project’s 400 afy, proportional to the reduced capacity of the Alternative 5a desalination plant. This would represent 0.11 percent of the total annual flow volume of the Salinas River, compared to the proposed project's 0.16 percent. Similarly, Alternative 5a would remove approximately 47 afy from Tembladero Slough, compared to the proposed project's 65 afy. These impacts would be reduced compared to the proposed project and would remain less than significant. Alternative 5b, similarly, would reduce impacts on Elkhorn Slough compared to those described for Alternative 1; however, because impacts cannot be quantified with the information available, it is assumed this impact would remain significant and unavoidable. Therefore, with respect to riparian habitat, critical habitat, or other sensitive natural communities, Alternative 5a would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation, and Alternative 5b would result in an ***increased impact conclusion*** compared to the proposed project, significant and unavoidable.

Under Alternative 5a, operation and maintenance of a reduced number of subsurface slant wells at CEMEX would reduce the potential for impacts on jurisdictional wetlands and other waters. Under Alternative 1, no maintenance would occur near the CEMEX settling ponds; however, operations and maintenance of subsurface slant wells at Potrero Road have some potential to cause runoff or sediment discharge to nearby Old Salinas River and associated tidal salt marsh. Implementation of **Mitigation Measures 4.6-1a** through **4.6-1c** would reduce these potential impacts to less than significant. No impact on waters of the U.S./waters of the State would result from maintenance and operation of all other facilities. Therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** with respect to wetlands and other waters during operation, less than significant with mitigation.

Alternative 5a would result in the same potential as the proposed project to spread invasive plants at the CEMEX site during operation (significant, but reduced to less than significant implementation of **Mitigation Measures 4.6-1** and **4.6-1p**). Alternative 5b would avoid impacts of the proposed project on the spread of invasive plants during operation because no maintenance would occur at the CEMEX site, and the Potrero Road site is disturbed and thus not susceptible to the spread of invasive plants. Maintenance and operations of all other facilities would not result in foreseeable surface disturbance which could contribute to the introduction or spread of invasive plants and would therefore have no impact. Therefore, Alternative 5a would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation, and Alternative 5b would result in a ***reduced impact conclusion*** with respect the spread of invasive plants during operation, no impact.

Alternatives 5a and 5b would have the same impact related to inconsistency with an adopted habitat conservation plan because all facilities contributing to this impact would be common with the proposed project. Implementation of **Mitigation Measures 4.6-1a**, **4.6-1n**, and **4.6-2b**, would reduce the impact to a less-than-significant level. Therefore, with respect to consistency with an adopted habitat conservation plan, operation of Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Cumulative Analysis

Combined Impacts with GWR Project

Construction of GWR Project (No. 59 in **Table 4.1-2** in Section 4.1) facilities may adversely affect, either directly or through habitat modification, special-status plant and wildlife species and their habitat. Significant impacts on special-status plant and animal species could occur during construction at all of the proposed GWR Project facility sites including impacts on some of the same resources as Alternatives 5a and 5b: sandmat manzanita, Monterey ceanothus, Monterey spineflower, Eastwood's goldenbush, and Kellogg's horkelia; roosting special-status bat species and nesting raptors, migratory birds, tricolored blackbird, western burrowing owl, California horned lark, white-tailed kite, or other protected avian species; Smith's blue butterfly; California tiger salamander, California red-legged frog; western pond turtle; California legless lizard; coast horned lizard; Monterey dusky-footed woodrat; Monterey ornate shrew; and American badger. The GWR Project also would include construction of facilities that could adversely affect jurisdictional wetlands and other waters and could result in the removal and/or trimming of protected trees. All impacts could be reduced to a less-than-significant level with implementation of mitigation approved as part of the adopted Mitigation Monitoring and Reporting Program for the GWR Project (MRWPCA and MPWMD, 2016). For the same reasons described for the proposed project and Alternatives 5a and 5b, the GWR Project could have a cumulatively significant impact on these resources, but after implementation of adopted mitigation measures, the GWR Project, in combination with the contribution of Alternatives 5a and 5b would result in a less than significant impact on these resources.

Operation of the GWR Project would affect the hydrology of the Salinas River with a potential reduction of up to 1 percent of the average annual flow, which would not be substantial in relation to total flows. In combination with the effects of Alternative 5a, the total effect would be a potential reduction of up to 1.11 percent of the average annual flow. These combined diversions would not result in significant cumulative impact on Salinas River flows or the associated riparian habitats, and the contribution of Alternative 5a would be less than significant. Alternative 5b would result in impacts on steelhead habitat in Elkhorn Slough, which was determined to be significant and unavailable. However, GWR would not affect steelhead habitat in Elkhorn Slough. Therefore, the GWR Project's effects on the hydrology of the Salinas River would not combine with potential effects of Alternative 5b and would not contribute to a significant impact on the hydrology of Elkhorn Slough.

Several components of Alternatives 5a and 5b that are common with the proposed project would be located within the *1997 Installation-Wide Multispecies Habitat Management Plan* (HMP) for the former Fort Ord area and construction and operations of these facilities could be inconsistent with the HMP. The GWR Project components located within the boundaries of former Fort Ord could be inconsistent with the local requirements for HMP plant species. Implementation of mitigation approved as part of the adopted Mitigation Monitoring and Reporting Program for the GWR Project (MRWPCA and MPWMD, 2016) would reduce the GWR Project's impact. Similarly, implementation of **Mitigation Measures 4.6-1a**, **4.6-1n**, and **4.6-2b** for Alternatives 5a and 5b would reduce potential impacts to a less-than-significant level, and for the same reasons described in Section 4.6.6 for the proposed project, the contribution of Alternatives 5a and 5b to a cumulative impact on the HMP would be less than significant. Alternative 5a, in combination with GWR, would result in significant unavoidable impacts because of conflict with City of Marina LCLUP policies. Alternative 5b, in combination with GWR, would result in significant unavoidable impacts because of Alternative 5b's conflict with the Marina LCLUP and the North County LCP/LUP policies and because of significant unavoidable impacts on steelhead habitat within Elkhorn Slough. Thus, considering either Alternative 5a or 5b together with the GWR Project, would result in significant and unavoidable cumulative effects.

Impacts of Full Cumulative Scenario

The cumulative scenario for Alternatives 5a and 5b would be the same as described in Section 4.6.6 for the proposed project, but as described above, would include the additional GWR Project. Contributions to cumulative impacts resulting from construction of Alternatives 5a and 5b would be reduced compared to those described for the proposed project, which is described in Section 4.6.6, consistent with the reduced impacts associated with fewer slant wells and a reduced desalination plant footprint as described above. While these impacts could result in cumulatively significant impacts, as described for the proposed project, these impacts would be mitigated consistent with what is described for the proposed project in Section 4.6.5. Following implementation of these mitigation measures, for the same reasons described for the proposed project in Section 4.6.6, the contributions of Alternatives 5a or 5b would result in a less than significant cumulative impact with the exception of the significant and unavoidable impact related to inconsistencies with the City of Marina LCLUP (Alternative 5a) and the City of Marina LCLUP and North County LCP/LUP (Alternative 5b). Construction of Alternative 5a and 5b could result in a significant cumulative impact on wetlands, but mitigation measures described as part of the proposed project (i.e., **Mitigation Measures 4.6-1a, 4.6-1b, 4.6-1c,** and **4.6-3**), would reduce the contribution of Alternative 5a and 5b to less than significant.

Overall, while some contributions to cumulative impacts would be reduced, the project footprint of the combined projects would result in an increased level of impact, and Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project, significant and unavoidable.

5.5.6.9 References

EMC Planning Group, Inc., 2016. Habitat Assessment for the California Red-Legged Frog, California Tiger Salamander, and Santa Cruz Long-Toed Salamander, Monterey Bay Regional Water Project, Moss Landing, Monterey County, California. Prepared for Deep Water Desal, LLC. Feb. 26, 2016.

Monterey Regional Water Pollution Control Agency and Monterey Peninsula Water Management District (MRWPCA and MPWMD), 2016. Consolidated Final Environmental Impact Report for the Pure Water Monterey Groundwater Replenishment Project, Volume IV, Exhibit B. http://purewatermonterey.org/wp/wp-content/uploads/Volume-IV-EIR-Certification-and-Project-Approval-Jan-2016.pdf.

State Water Resources Control Board (SWRCB), 2016. *Order WR 2016-0016, In the Matter of Application of California American Water Company, To Amend State Water Board Order 2009-0060*. Adopted July 19, 2016.

5.5.7 Hazards and Hazardous Materials

The evaluation criteria for Hazards and Hazardous Materials address: hazards to the public or the environment from accidental spills during construction, and during operation; encountering hazardous materials from, or locating facilities on a hazardous materials site; handling hazardous materials near a school, and; increased risk of wildland fires during construction. Construction of all facilities will involve the use of hazardous materials (e.g. fuel, lubricants, paints, and solvents) but only the slant wells, the desalination plant, the ASR wells, and the Carmel Valley Pump Station would use hazardous materials during operation. Proposed facilities near the wildlands of the former Fort Ord, and in Carmel Valley, are located in or near areas classified by CAL FIRE as High or Very High Hazard Severity Zones.

5.5.7.1 Setting/Affected Environment

The components of the alternatives that are common to the proposed project are located south of the Nashua Road/Highway 1 intersection and the setting/affected environment for those facilities is described in Section 4.7, Hazards and Hazardous Materials. The setting for the components north of the Nashua Road/Highway 1 intersection is presented below.

Hazardous Materials Sites in the Moss Landing Area

The hazardous materials sites discussed below are the only active hazardous materials sites in the Moss Landing area and would have the potential to overlap with the components unique to Alternatives 2, 3, and 4. There are no hazardous sites that overlap with the components unique to Alternatives 1 or 5b and there are no known hazardous materials sites within Monterey Bay in MBNMS.

Former National Refractories

The former refractory property, which is the site for the Alternative 4 desalination plant, is located at the southeast corner of Highway 1 and Dolan Road. It was used as a mineral extraction and processing facility and a brick production plant until the bankruptcy of National Refractories in 2002 (CapRock, 2013, 2016). This facility had several onsite landfills, settling ponds, borrow areas, above and below ground storage tanks, and underground fuel lines. The refractory had historic releases of hexavalent chromium, other metals (barium, total chromium, molybdenum, nickel, and zinc), solvents, and fuels to soil and groundwater. Most of the historical structures have been removed. Site investigation and remediation activities are in progress.

Fuel contamination was released from the former USTs located about 200 feet south of Dolan Road. The contamination in soil and groundwater is reportedly limited to the former refractory property and is being remediated by a soil vapor extraction system.

Chromite ore piles have been removed from the property, eliminating a source of hexavalent chromium. However, hexavalent chromium is reportedly present in groundwater throughout the former refractory property and may extend for an unknown distance to areas north of Dolan Road and south of the former refractory property. Some of the source of hexavalent chromium in groundwater is from the onsite historical use of chromium. Background studies also revealed that naturally-occurring chromium-bearing minerals in the local Aromas Red Sands Formation are a source of the hexavalent chromium detected in the Aromas Aquifer. Remediation activities for hexavalent chromium in groundwater have consisted of the injection of a lactate solution to stimulate microbial activity to transform hexavalent chromium to the less toxic trivalent chromium, which largely precipitates out of groundwater. Hexavalent chromium concentrations have been reduced but are still above action levels in some areas. The depth to groundwater ranged from 16.65 to 29.96 feet below the ground surface on November 11, 2015 (CapRock, 2016).

Dynegy Moss Landing (aka Moss Landing Power Plant)

The Dynegy Moss Landing site, also known as the Moss Landing Power Plant, is located along the north side of Dolan Road extending from Highway 1 east to Via Tanques Road (DTSC, 2016). This site is located north across Dolan Road from the Alternative 4 desalination plant site; and directly west of the Alternative 3 desalination plant site. Portions of the Alternative 2 and 3 intake pump station and intake pipeline would overlap with the area of contamination reported at this site. PG&E is the original owner and retains responsibility for environmental cleanup. Dynegy, current owner, took control of the facility in 2007. Nine power generation units have been used at the site since its inception. Fuel oil was burned to generate power before switching to natural gas. The constituents of concern at the facility are petroleum hydrocarbons, volatile organic compounds, polynuclear aromatic hydrocarbons, metals, polychlorinated biphenyls (PCBs), and asbestos. Soil and groundwater investigation and cleanup are in progress. The extent of soil and groundwater contamination is both onsite and offsite. The property has land use restrictions that prohibit onsite soil excavation and groundwater extraction without the approval of the DTSC. The power generation and subsequent investigation and cleanup activities are in the western portion of the property and contamination has not been reported in the eastern portion of the property.

Calera Corporation Moss Landing Cement Company

The Calera Corporation Moss Landing Cement Company is located at 7696 Highway 1 in Moss Landing just southeast of the Highway 1 and Dolan Road intersection. It is located west-southwest of the Alternative 3 desalination plant site and adjacent to the Alternative 4 desalination plant site. The site had seven containment structures that have not been used since 2011. Remediation was conducted in 2011 and the site owners are planning to submit a case closure request (RWQCB, 2016). The GeoTracker website provided summary information but no investigation or cleanup reports.

Other Hazards Considerations

There are no airports within 2 miles and no schools within 0.25 mile of the components located north of the Nashua Road/Highway 1 intersection; the area is not within a very high or high fire hazard severity zone (CAL FIRE, 2007, 2008).

5.5.7.2 Direct and Indirect Effects of Proposed Project (Slant Wells at CEMEX)

The proposed project extends from Castroville in the north to the city of Carmel in the south (see **Figure 3-2**) and would include construction of a desalination plant on 25 acres along Charles Benson Road northeast of the City of Marina, up to nine new subsurface slant wells at the CEMEX active mining area, two new wells (ASR-5 and ASR-6) at the existing Seaside Groundwater Basin aquifer storage and recovery (ASR) system, the Carmel Valley Pump Station, and about 21 miles of water conveyance pipelines. The direct and indirect impacts of the proposed project are described in detail in Section 4.7.5.

Impact 4.7-1: Create a significant hazard to the public or the environment through the routine transport, use, disposal, or accidental release of hazardous materials during construction.

Petroleum products, such as gasoline, diesel fuel, lubricants, and cleaning solvents would be utilized to fuel and maintain construction vehicles and equipment for all project components. The proposed slant wells would use drilling fluids, such as bentonite mud and foam to assist the rotary drilling techniques. The construction contractor would pump out all of the sand-bentonite mud slurry and put it in a storage container for offsite hauling and disposal. Installation of the ASR Wells may use non-corrosive, environmentally inert, biodegradable additives to keep the drill hole open. Construction activities are required to comply with numerous hazardous materials and stormwater regulations, (such as the Hazardous Materials Business Plan (HMBP), Stormwater Pollution Prevention Plan (SWPPP), and California Fire Code) designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner. Through compliance with applicable hazardous materials storage, disposal, and stormwater permitting regulations, impacts associated with potential releases from the routine transport, use, or disposal of hazardous materials or the accidental release of hazardous materials during construction would be less than significant for all project components.

Impact 4.7-2: Encountering hazardous materials from other hazardous materials release sites during construction.

The proposed project involves excavation, trenching, and grading for the construction of water conveyance pipelines, building footings, and utilities. Some sites with known soil and/or groundwater contamination are located within 0.25 mile of project facilities and may have affected subsurface conditions at various locations along the project area. If substantial hazardous materials are present in excavated soils, health and safety risks to workers and the public could occur. Such risks could occur from stockpiling, handling, or transportation of contaminated soils. The dewatering of contaminated groundwater could also present risks to public health and safety, and the environment, if the contaminated groundwater (i.e., dewatering effluent) is not handled properly. The potential for contaminated soil and groundwater to be released into the environment during project construction would be considered a significant impact. These impacts would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.7-2a** (**Health and Safety Plan**), which requires that construction contractors prepare a health and safety plan in accordance with Cal OSHA regulations and **4.7-2b** (**Soil and Groundwater**

Management Plan), which requires construction contractors to comply with all relevant environmental regulations and plan appropriately for the safe and lawful handling and disposal of excavated soil and groundwater.

Impact 4.7-3: Location on a known hazardous materials site.

Portions of the new Transmission Main and ASR Pipelines would be located in the former Fort Ord Seaside Munition Response Areas, a known former hazardous materials site that is identified on the National Priorities List. Construction activities within this area have the potential to encounter undiscovered unexploded ordnance, which, if not identified and properly handled, could cause injury to or death of construction workers or result in wildfire. Compliance with the City of Seaside's Ordnance Remediation District regulations and the environmental protection provisions of the Findings of Suitability for Early Transfer (FOSET) agreement between Fort Ord Reuse Authority and the City of Seaside would ensure that project impacts are less than significant. None of the other project components are located within a known hazardous materials site.

Impact 4.7-4: Handle hazardous materials or emit hazardous emissions within 0.25 mile of a school during construction.

The new Desalinated Water Pipeline, new Transmission Main, ASR Pipelines, and Ryan Ranch-Bishop Interconnection Improvements Pipeline would be located within 0.25 miles of a school and, as discussed in Impact 4.7-1, would require the use of fuel, lubricants, paints, and solvents. The HMBP and SWPPP discussed under Impact 4.7-1, above, impose performance standards on the construction activities that would ensure the risk of release of hazardous materials during construction would be low. Therefore, the potential for a hazardous materials release during construction to result in increased exposure to hazardous materials at the nearby schools is remote; this impact is less than significant. None of the other proposed project components are located within 0.25-mile of a school. No impact would result.

Impact 4.7-5: Increased risk of wildland fires during construction.

The new Transmission Main, ASR Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station are proposed in or near areas classified by CAL FIRE as High or Very High Fire Hazard Severity Zones. California regulations governing the use of construction equipment in fire prone areas are designed to minimize the risk of wildland fires (e.g., PRC Sections 4411 et seq.). In addition, the California Fire Code addresses the fire safety of general construction operations. The construction contractor must comply with these regulations and any additional requirements imposed by CAL FIRE or the local fire protection departments. With compliance, the impact associated with an increased risk of wildland fires during construction would be less than significant.

None of the other project facilities are located within or near an area classified by CAL FIRE as a High or Very High Fire Hazard Severity Zone; however, construction activities could temporarily increase fire risk. Compliance with California Fire Code regulations would ensure that the potential impact associated with an increased risk of fire during construction of all other project components would be less than significant.

Impact 4.7-6: Create a significant hazard to the public or the environment through the routine transport, use, disposal, or accidental release of hazardous materials during project operations.

Operation and maintenance of the proposed subsurface slant wells, MPWSP Desalination Plant, ASR-5 and ASR-6 Wells, and Carmel Valley Pump Station would involve the routine use and storage of hazardous materials. Through compliance with existing state and federal laws and regulations regarding hazardous materials storage and management, the potential for environmental impacts due to the accidental release of hazardous materials would be less than significant. Operation of all pipelines, Ryan Ranch-Bishop Interconnection Improvements, and the Main System-Hidden Hills Interconnection Improvements would have no impact related to the inadvertent release of hazardous materials.

Impact 4.7-C: Cumulative impacts related to hazards and hazardous materials.

Proposed project construction and operation would not have a significant contribution to cumulative impacts on the public or the environment through the transport, use, disposal, or accidental release of hazardous materials or to cumulative effects associated with wildfire risk because the likelihood that the proposed project and cumulative projects in the vicinity of project components would be under construction at the same time is remote. The proposed project's contribution could result in a potentially significant cumulative impact from the potential release of or exposure to hazardous materials in soil or groundwater from more than one project, but implementation of mitigation measures identified in Impact 4.7-2 would reduce the overall cumulative impact to a less-than-significant level.

5.5.7.3 Direct and Indirect Effects of No Project Alternative

Under the No Project Alternative, no new facilities would be constructed or operated. Consequently, there would be no construction- or operations-related use of hazardous materials, no chance of encountering or releasing hazardous materials or of locating a facility on an existing hazardous materials site associated with the No Project Alternative. However, decommissioning of the existing test slant well could result in potentially significant but mitigable impacts related to hazards and hazardous materials, including the potential to encounter contaminated soil/and or groundwater. See Impact 4.7-2 in Section 4.7.5.1. Implementation of Mitigation Measures 4.7-2a and 4.7-2b would reduce the impacts to a less-than-significant level.

Because the No Project Alternative's impact would be less than significant with mitigation, its contribution to cumulative effects related to hazards or hazardous materials would be less than significant.

5.5.7.4 Direct and Indirect Effects of Alternative 1 – Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.3.3.2, Intake Option 3 – Subsurface Slant Wells at Potrero Road). The desalination plant, brine discharge pipeline, Castroville

Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**).

Construction Impacts

Petroleum products, such as gasoline, diesel fuel, lubricants, and cleaning solvents would be used to fuel and maintain construction vehicles and equipment for all components of Alternative 1. The 5.5 miles of additional source water pipeline, and the one additional well required for Alternative 1 (10 new wells at Potrero Road versus 9 new wells plus the converted test well at CEMEX) would increase the potential for accidental spills compared to the proposed project. However, through compliance with applicable hazardous materials storage, disposal, and stormwater permitting regulations, impacts associated with potential releases from the routine transport, use, or disposal of hazardous materials or the accidental release of hazardous materials during construction would result in the ***same impact conclusion*** as the proposed project, less than significant.

Alternative 1 would involve excavation, trenching, and grading for the construction of water conveyance pipelines and building footings. If substantial hazardous materials are present in excavated soils, health and safety risks to workers and the public could occur. The dewatering of contaminated groundwater could also present risks to public health and safety, and the environment, if the contaminated groundwater (i.e., dewatering effluent) is not handled properly. The change from the CEMEX site to the Potrero Road site would not result in encountering any additional known hazardous materials sites and the potential impact would be the same as the proposed project. The potential impact at common component locations would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.7-2a** (**Health and Safety Plan**), which requires that construction contractors prepare a health and safety plan in accordance with Cal OSHA regulations and **4.7-2b** (**Soil and Groundwater Management Plan**), which requires construction contractors to comply with all relevant environmental regulations and plan appropriately for the safe and lawful handling and disposal of excavated soil and groundwater. Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

No component unique to Alternative 1 would be located within 0.25 mile of a school and the potential for Alternative 1 to emit hazardous emissions within 0.25 miles of a school would be the same as the proposed project. Compliance with all relevant hazardous materials storage and permitting requirements would minimize the risk of releases and Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant.

No component unique to Alternative 1 would be located in a High or Very High Fire Hazard Safety Zone and Alternative 1 would result in a the same level of impact and the ***same impact conclusion*** as the proposed project, less than significant.

Operational and Facility Siting Impacts

Operations and maintenance activities associated with Alternative 1 would involve the same storage and use of hazardous materials and the transport of hazardous wastes generated during operations as the proposed project and compliance with applicable laws, permits and regulations would result in the ***same impact conclusion*** as the proposed project, less than significant.

No component unique to Alternative 1 would be located on a known hazardous material site. Therefore, the potential to create a hazard to the public would be the same as the proposed project and Alternative 1 would have the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

Cumulative impacts resulting from the components of Alternative 1 that are common with the proposed project would be the same as those described for the proposed project in Section 4.2.6. The geographic scope of analysis for cumulative impacts related to hazards and hazardous materials for the components that differ from the proposed project is defined by the location of the Alternative 1 intake system and associated pipelines north of the Nashua Road/Highway 1 intersection. Of the cumulative projects described in **Table 4.1-2** in Section 4.1, the DeepWater Desal Project (No. 34) is the only additional project that would have components located near Alternative 1 components; however, the DeepWater Desal Project facilities would be located north of Potrero Road at Moss Landing and would not geographically overlap with Alternative 1 components; therefore, the impacts of these components would not combine with impacts of Alternative 1. No other cumulative projects are located in this Potrero Road area, and no changes or increases in cumulative impacts would occur. Similar to the proposed project, with implementation of **Mitigation Measures 4.7-2a** and **4.7-2b**, Alternative 1's contribution to a significant cumulative impact regarding encountering hazardous materials sites would be reduced to a level that is less than significant. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to hazardous materials, less than significant with mitigation.

5.5.7.5 Direct and Indirect Effects of Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a new, screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station on Dolan Road (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water that originated from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to Castroville Community Services District would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see

Figure 5.4-2). Therefore, the hazards and hazardous materials impact analysis of Alternative 2 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 2.

Construction Impacts

Petroleum products would be used to fuel and maintain construction vehicles and equipment for all components of Alternative 2. The 6.5 miles of additional source water pipeline, the new screened open water intake and the elimination of the Castroville Pipeline would increase the potential for accidental spills compared to the proposed project. However, through compliance with applicable hazardous materials storage, disposal, and stormwater permitting regulations, impacts associated with potential releases from the routine transport, use, or disposal of hazardous materials or the accidental release of hazardous materials during construction would result in the ***same impact conclusion*** as the proposed project, less than significant.

The construction of the open water intake system, including a pump station on Dolan Road and the installation of the intake pipeline (HDD technique), and the additional 6.5 miles of source water pipeline (open trench and HDD construction), would result in an increase in potential of encountering hazardous materials in soil and groundwater from the known hazardous materials sites in the Moss Landing area compared to the proposed project, resulting in a potentially significant impact. The potential release of or exposure to hazardous materials in soil or groundwater would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.7-2a** (**Health and Safety Plan**) which would require that construction contractors prepare a health and safety plan in accordance with Cal OSHA regulations, and **Mitigation Measure 4.7-2b** (**Soil and Groundwater Management Plan**) which requires construction contractors to comply with all relevant environmental regulations and plan appropriately for the safe and lawful handling and disposal of excavated soil and groundwater, when encountered. Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

No component unique to Alternative 2 would be located within 0.25 mile of a school and the potential for Alternative 2 to emit hazardous emissions within 0.25 miles of a school would be the same as the proposed project. Compliance with all relevant hazardous materials storage and permitting requirements would minimize the risk of releases and Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant.

No component unique to Alternative 2 would be located in a High or Very High Fire Hazard Safety Zone and Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Operational and Facility Siting Impacts

In addition to portions of the new Transmission Main and ASR Pipelines, the Alternative 2 pump station on Dolan Road would be located on or near the known hazardous material sites at Moss Landing. Therefore, the potential to create a hazard to the public would be increased compared to the proposed project. However, compliance with regulations would ensure that project impacts are less than significant. Therefore, Alternative 2 would have the ***same impact conclusion*** as the proposed project, less than significant.

Operations and maintenance activities associated with Alternative 2 would involve the same storage and use of hazardous materials and the transport of hazardous wastes generated during operations as the proposed project and compliance with applicable laws, permits and regulations would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

Cumulative impacts resulting from the components of Alternative 2 that are common with the proposed project would be the same as those described for the proposed project in Section 4.2.6. The geographic scope of analysis for cumulative impacts related to hazards and hazardous materials for the components that differ from the proposed project is defined by the location of the Alternative 2 open water intake system and associated pipelines north of the Nashua Road/Highway 1 intersection. Alternative 2 would not contribute to cumulative impacts related to proximity to schools or airports, or location within a very high or high fire severity hazard zone.

The DeepWater Desal Project (No. 34) and the Moss Landing Community Plan (No. 37), described in **Table 4.1-2** in Section 4.1 are located geographically near or overlap the Alternative 2 components. Various proposed surface construction projects are included in the Moss Landing Community Plan and the estimated time of construction is unknown. These projects would be required to comply with the same requirements as Alternative 2. All project components involving the handling, storage, and disposal of hazardous materials would be required to prepare a HMBP and comply with applicable regulations, including those governing containment, site layout, and emergency response and notification procedures in the event of a spill or release. Transportation and disposal of wastes, such as spent cleaning solutions, would also be subject to regulations for the safe handling, transportation, and disposal of chemicals and wastes. Such regulations include standards to which parties responsible for hazardous materials releases must return spill sites, regardless of location, frequency, or size of release, or existing background contaminant concentrations. Compliance with existing laws and regulations regarding hazardous materials transport would reduce the risk of environmental or human exposure to such materials and would reduce impacts of each project to a level and geographic scope such that they would not combine with one another to cause significant cumulative impacts. Similar to the proposed project, with implementation of **Mitigation Measures 4.7-2a** and **4.7-2b**, Alternative 2's contribution to a significant cumulative impact regarding encountering hazardous materials sites would be reduced to a level that is less than significant. Therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to hazardous materials, less than significant with mitigation.

5.5.7.6 Direct and Indirect Effects of the Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The 2 pipelines for the intake and 2 pipelines for the discharge systems would be installed using HDD. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-3**, ASR 5 and 6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water that originated from the Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**). Therefore, the impact analysis of Alternative 3 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 3.

Construction Impacts

Petroleum products would be used to fuel and maintain construction vehicles and equipment for all components of Alternative 3. The 6.5 miles of additional source water pipeline, the new screened open water intake and discharge, the 25 miles of additional desalinated water pipeline, and the larger desalination facility and co-located data center would increase the potential for accidental spills during construction compared to the proposed project. However, through compliance with applicable hazardous materials storage, disposal, and stormwater permitting regulations, impacts associated with potential releases from the routine transport, use, or disposal of hazardous materials or the accidental release of hazardous materials during construction, Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant.

The construction of the open water intake system, including a pump station on Dolan Road and the installation of the 2 intake and 2 discharge pipelines (HDD technique), and the additional 31.5 miles of additional pipeline (open trench and HDD construction), would result in an increase in potential, of encountering hazardous materials in soil and groundwater from the known hazardous materials sites in the Moss Landing area compared to the proposed project, resulting in a potentially significant impact. The potential release of or exposure to hazardous materials in soil or groundwater would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.7-2a** (**Health and Safety Plan**) which would require that construction contractors prepare a health and safety plan in accordance with Cal OSHA regulations, and **Mitigation Measure 4.7-2b** (**Soil and Groundwater Management Plan**) which requires construction contractors to comply with all relevant environmental regulations and plan appropriately for the safe and lawful handling and disposal of excavated soil and groundwater, when encountered. Therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

No component unique to Alternative 3 would be located within 0.25 mile of a school and the potential for Alternative 3 to emit hazardous emissions within 0.25 miles of a school would be the same as the proposed project. Compliance with all relevant hazardous materials storage and permitting requirements would minimize the risk of releases and Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant.

No component unique to Alternative 3 would be located in a High or Very High Fire Hazard Safety Zone and Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Operational and Facility Siting Impacts

In addition to portions of the new Transmission Main and ASR Pipelines, the Alternative 3 pump station on Dolan Road would be located on or near the known hazardous material sites at Moss Landing. Therefore, the potential to create a hazard to the public would be increased compared to the proposed project. However, compliance with regulations would ensure that project impacts are less than significant. Therefore, Alternative 3 would have the ***same impact conclusion*** as the proposed project, less than significant.

Operations and maintenance activities associated with Alternative 3 would involve increased volumes of hazardous materials storage and use of hazardous materials and the transport of hazardous wastes generated during operations as the proposed project because of the much larger desalination plant capacity. However, Alternative 3 compliance with applicable laws, permits and regulations would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

Cumulative impacts resulting from the components of Alternative 3 that are common with the proposed project would be the same as those described for the proposed project in Section 4.2.6. The geographic scope of analysis for cumulative impacts related to hazards and hazardous materials for components that differ from the proposed project is defined by the location of the Alternative 3 components located north of the Nashua Road/Highway 1 intersection. Alternative 3 would not contribute to cumulative impacts related to proximity to schools or airports, or location within a very high or high fire severity hazard zone.

The Moss Landing Community Plan (No. 37 in **Table 4.1-2** in Section 4.1) is located in the Moss Landing area. The contributions of the Moss Landing Community Plan projects to hazards and hazardous materials-related impacts would be as described under Alternative 2. As described for Alternative 2, compliance with existing laws and regulations regarding hazardous materials transport would reduce the risk of environmental or human exposure to such materials and would reduce impacts of each project to a level and geographic scope such that they would not combine with one another to cause significant cumulative impacts. Similar to the proposed project, with implementation of **Mitigation Measures 4.7-2a** and **4.7-2b**, Alternative 3's contribution to a significant cumulative impact regarding encountering hazardous materials sites would be reduced to a level that is less than significant. Therefore, Alternative 3 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to hazardous materials, less than significant with mitigation.

5.5.7.7 Direct and Indirect Effects of Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water originating from the Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**). Therefore, the impact analysis of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4.

Construction Impacts

Petroleum products would be used to fuel and maintain construction vehicles and equipment for all components of Alternative 4. The installation of the intake and discharge pipelines, the new screened open water intake and brine discharge system, the 6.5 miles of additional desalinated water pipeline, and the larger desalination facility would increase the potential for accidental spills compared to the proposed project. However, through compliance with applicable hazardous materials storage, disposal, and stormwater permitting regulations, impacts associated with potential releases from the routine transport, use, or disposal of hazardous materials or the accidental release of hazardous materials during construction would result in the ***same impact conclusion*** as the proposed project, less than significant.

The construction of the open water intake system, including the pump station at the caisson, the installation of the intake and brine discharge pipelines (HDD technique), and the additional 6.5 miles of desalinated water pipeline (open trench and HDD construction), would result in an increase in potential of encountering hazardous materials in soil and groundwater from the known hazardous materials sites in the Moss Landing area compared to the proposed project, resulting in a potentially significant impact. The potential release of or exposure to hazardous materials in soil or groundwater would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.7-2a** (**Health and Safety Plan**) which would require that construction contractors prepare a health and safety plan in accordance with Cal OSHA regulations, and **Mitigation Measure 4.7-2b** (**Soil and Groundwater Management Plan**) which requires construction contractors to comply with all relevant environmental regulations and plan appropriately for the safe and lawful handling and disposal of excavated soil and groundwater, when encountered. Therefore, Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

No component unique to Alternative 4 would be located within 0.25 mile of a school and the potential for Alternative 4 to emit hazardous emissions within 0.25 miles of a school would be the same as the proposed project. Compliance with all relevant hazardous materials storage and permitting requirements would minimize the risk of releases and Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant.

No component unique to Alternative 4 would be located in a High or Very High Fire Hazard Safety Zone and Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Operational and Facility Siting Impacts

In addition to portions of the new Transmission Main and ASR Pipelines, the Alternative 4 desalination plant would be located on or near a known hazardous material site at Moss Landing. Therefore, the potential to create a hazard to the public would be increased compared to the proposed project. However, compliance with regulations would ensure Alternative 4 would have the ***same impact conclusion*** as the proposed project, less than significant.

Operations and maintenance activities associated with Alternative 4 would involve an increased volume of storage and use of hazardous materials and the transport of hazardous wastes generated during operations compared to the proposed project due to the larger desalination capacity. However, Alternative 4 compliance with applicable laws, permits and regulations would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

Cumulative impacts resulting from the components of Alternative 4 that are common with the proposed project would be the same as those described for the proposed project in Section 4.2.6. The geographic scope of analysis for cumulative hazards and hazardous materials impacts is defined by the location of the Alternative 4 open water intake system, desalination facility, and associated pipelines north of the Nashua Road/Highway 1 intersection. Alternative 4 would not contribute to cumulative impacts related to proximity to schools or airports, or location within a very high or high fire severity hazard zone.

The DeepWater Desal Project (No. 34 in **Table 4.1-2** in Section 4.1) and the Moss Landing Community Plan (No. 37) are located in the Moss Landing area. The contributions of these projects to hazards and hazardous materials-related impacts would be as described under Alternative 2. As described for Alternative 2, compliance with existing laws and regulations regarding hazardous materials transport would reduce the risk of environmental or human exposure to such materials and would reduce impacts of each project to a level and geographic scope such that they would not combine with one another to cause significant cumulative impacts. Similar to the proposed project, with implementation of **Mitigation Measures 4.7-2a** and **4.7-2b**, Alternative 4's contribution to a significant cumulative impact regarding encountering hazardous materials sites would be reduced to a level that is less than significant. Therefore, Alternative 4 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to hazardous materials, less than significant with mitigation.

5.5.7.8 Direct and Indirect Effects of Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1 (5.5 additional miles compared to the proposed project). Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction Impacts

Construction of Alternatives 5a and 5b components would have a slightly reduced footprint because of the reduced number of wells and smaller sized desalination plant compared to the proposed project and Alternative 1, respectively, resulting in a similar level of potential for accidental spills compared to the proposed project. However, through compliance with applicable hazardous materials storage, disposal, and stormwater permitting regulations, impacts associated with potential releases from the routine transport, use, or disposal of hazardous materials or the accidental release of hazardous materials during construction would result in the ***same impact conclusion*** as the proposed project, less than significant.

Similar to the proposed project and Alternative 1, the implementation of **MMs 4.7-2a** and **4.7-2b** would reduce the potential for harmful exposure to hazardous materials present in soil or groundwater during construction of Alternative 5a or 5b, respectively, to a less-than-significant level and would result in the ***same impact conclusions*** compared to the proposed project; less than significant with mitigation.

No components of Alternative 5a or 5b would be located within 0.25 mile of a school and the potential for Alternative 5a or 5b to emit hazardous emissions within 0.25 miles of a school would be the same as the proposed project. Compliance with all relevant hazardous materials storage and permitting requirements would minimize the risk of releases and Alternative 5a or 5b would result in the ***same impact conclusion*** as the proposed project, less than significant.

No component of Alternative 5a or 5b would be located in a High or Very High Fire Hazard Safety Zone and Alternative 5a or 5b would result in the ***same impact conclusion*** as the proposed project, less than significant.

Operational and Facility Siting Impacts

Other than portions of the new Transmission Main and ASR Pipelines, no other components of Alternative 5a or 5b would be located on or near the known hazardous material site at Moss Landing. Therefore, the potential to create a hazard to the public would be increased compared to the proposed project and compliance with regulations would ensure Alternative 5a or 5b would have the ***same impact conclusion*** as the proposed project, less than significant.

Operations and maintenance activities associated with Alternative 5a or 5b would involve reduced storage and use of hazardous materials and the transport of hazardous wastes generated during operations compared to the proposed project, and compliance with applicable laws, permits and regulations would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

The geographic scope of analysis for cumulative hazards and hazardous materials impacts for Alternatives 5a and 5b is the same as for the proposed project and Alternative 1, respectively. In addition to the projects identified as relevant to the cumulative analyses for the proposed project and Alternative 1, the GWR Project (No. 58 in **Table 4.1-2** in Section 4.1) is relevant to both Alternatives 5a and 5b. The GWR Project would be subject to compliance with existing laws and regulations regarding hazardous materials transport that would reduce the risk of environmental or human exposure to such materials and would reduce impacts of each project to a level and geographic scope such that they would not combine with one another to cause significant cumulative impacts. Similar to the proposed project, with implementation of **Mitigation Measures 4.7-2a** and **4.7-2b**, Alternative 5a and 5b's contribution to a significant cumulative impact regarding encountering hazardous materials sites would be reduced to a level that isless than significant. Therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to hazardous materials, less than significant with mitigation.

5.5.7.9 References

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5.5.8 Land Use, Land Use Planning, and Recreation

The evaluation criteria for Land Use, Land Use Planning, and Recreation address: consistency with applicable plans, policies, and regulations related to land use and recreation that were adopted for the purpose of mitigating and environmental effect; and disrupting or precluding public access to or along the coast during construction.

5.5.8.1 Setting/Affected Environment

The components of the alternatives that are common to the proposed project are located south of the Nashua Road/Highway 1 intersection and the setting/affected environment for those facilities is described in Section 4.8, Land Use, Land Use Planning, and Recreation. The setting for the components north of the Nashua Road/Highway 1 intersection is presented below.

Pipeline Alignments North of Nashua Road/Highway 1 Intersection

Lands adjacent to the pipeline alignments north of the Nashua Road/Highway 1 Intersection that are part of Alternatives 1, 2, 3, 4 and 5b are used for agricultural, light and heavy industrial, commercial, residential, and public/quasi-public purposes. Local Coastal Program (LCP) land use plan designations for lands adjacent to the pipeline alignments include: Agricultural Preservation, Recreation and Visitor Serving, Residential – Medium Density, Outdoor Recreation, General Commercial, Wetlands and Coastal Strand, Industrial – Coast Dependent – Heavy, and Heavy Industrial. The zoning designations of lands adjacent to the pipeline alignments for Alternatives 1, 2, 3, 4 and 5b include: Coastal Agricultural Preservation (CAP), Agricultural Conservation (AC), Heavy Industrial (HI) and Resource Conservation (RC). All pipeline segments north of the Nashua Road/Highway 1 intersection would occur within the Coastal Zone. Nearby recreational lands and facilities include Salinas River State Beach, the Elkhorn Slough National Estuarine Research Reserve ("Elkhorn Slough") and the Moro Cojo Slough State Marine Reserve ("Moro Cojo Slough"). The Monterey Bay Sanctuary Scenic Trail alignment follows Highway 1 through Moss Landing. However, the segment that passes through Moss Landing is either undeveloped or limited to the Highway 1 shoulder.

Potrero Road Parking Lot

The Potrero Road parking lot (part of Alternatives 1 and 5b) is located at the western terminus of Potrero Road and serves Salinas River State Beach. Lands adjacent to the parking lot include the Salinas River State Beach to the west and the Old Salinas River channel and fringing marshes to the north, south, and east. The nearest development is a small neighborhood located approximately 800 feet to the northeast. The LCP land use plan designation for lands adjacent to the Potrero Road parking lot is Scenic and Natural Resource Recreation. The zoning designation of lands adjacent to the parking lot is Open Space Recreation (OR). The parking lot lies within the Coastal Zone. Recreational resources in the vicinity of the Potrero Road parking lot include Salinas River State Beach.

Moss Landing

The stretch of Moss Landing beach in the vicinity of components of Alternatives 1, 2, 3, 4, and 5b is located on the west side of Moss Landing's southern peninsula, approximately 250 feet west of Sandholdt Road. Land uses in this area include Moss Landing Beach, the Monterey Bay Aquarium Research Institute, restaurants, and various commercial and marine-related light-industrial developments. Sandholdt Lot, Salinas River State Beach, is located approximately 150 feet to the south of this area. The LCP land use plan designations are Industrial – Coast Dependent – Light and Education – Scientific. The zoning designations are Light Industrial (LI) and Public/Quasi-Public (PQP). The area lies within the Coastal Zone. Nearby recreational lands and facilities include the Salinas River State Beach and the Elkhorn Slough National Estuarine Research Reserve.

Moss Landing Green Commercial Park

The Moss Landing Green Commercial Park is located east of Highway 1 and south of Dolan Road, in Moss Landing. The site is the location of the Alternative 4 desalination plant and it includes various tanks, warehouses, and administrative structures remaining from the former National Refractories & Minerals Corporation's magnesium production operations. The LCP land use plan designation is Industrial – Coast Dependent – Heavy. The zoning designation is Heavy Industrial (HI). The site lies within the Coastal Zone. Nearby recreational resources and facilities include the Monterey Bay Sanctuary Scenic Trail and Elkhorn Slough.

East Tank Farm Parcel

The East Tank Farm Parcel is located north of and adjacent to Dolan Road, approximately 2 miles east of Highway 1 and is the Alternative 3 desalination plant site. The former fuel oil storage site has been remediated and is presently clear of development except for one storage tank and appurtenant facilities. The site is bordered by lands used for agricultural and light industrial activities. The LCP land use plan designation is Heavy Industrial. The zoning designation is Heavy Industrial (HI). The site lies within the Coastal Zone. Recreational facilities and resources in the vicinity include Elkhorn Slough and Moro Cojo Slough.

Regulatory Framework

Regulatory requirements applicable to the proposed project that are related to land use and recreation are presented in Section 4.8.2, Regulatory Framework. Many of the plans, policies, and regulations identified in that section would also apply to the components unique to the project alternatives, including: the National Marine Sanctuaries Act; the California Coastal Act; and the Monterey County Local Coastal Program (LCP). In addition, the Salinas River State Beach General Plan and the Moss Landing Community Plan would apply to components of project alternatives. With respect to land use and recreation, key tenets of these regulatory requirements include prioritizing coastal dependent land uses, maximizing public access to and along the coast, and preserving and enhancing recreational opportunities. The consistency analyses presented in the impacts subsections below consider each alternative's conformity with these principles.

Salinas River State Beach General Plan

The Salinas River State Beach General Plan (General Plan) outlines a framework for park management, providing for protection of natural resources; improving park access; and for the siting, design, and construction of future park improvements in a manner that avoids environmental effects. Prominent among the General Plan's guiding principles is the provision and management of recreational opportunities consistent with resource management and protection. Alternatives' components that could occur on Salinas River State Beach include the subsurface slant wells and Source Water Pipeline (Alternatives 1 and 5b).

Moss Landing Community Plan

The Moss Landing Community Plan (MLCP) Area encompasses the Moss Landing neighborhoods of Elkhorn, Dolan, North Harbor, Island, South Harbor, Village Center, and Heights. The MLCP is a component of and contains community-specific policies that supplement the more general North County Land Use Plan policies to achieve the basic goals of the California Coastal Act, including maximizing public access and recreational opportunities in the coastal zone, among others. The MLCP is presently undergoing a comprehensive update. All alternatives' components sited along and north of Potrero Road would be subject to the MLCP.

Monterey County Land Use Plan and Zoning Designations

This subsection includes an evaluation of the potential for alternatives' components' to conflict with existing Monterey County land use plan and zoning designations. As noted previously, all facilities would be located within Monterey County's coastal zone on lands for which land uses have been classified and zoned pursuant to the North County Land Use Plan and the Monterey County Coastal Implementation Plan (Title 20, Zoning Ordinance), respectively. As discussed below, all alternatives' facilities would require a use permit from Monterey County and would be subject to review and approval pursuant to the provisions of the Local Coastal Plan and other applicable land use policies and regulations. The following is an assessment of established land use plan and zoning designations for alternatives' facilities north of the Nashua Road/Highway 1 intersection.

- Pipelines north of the Nashua Road/Highway 1 intersection would be sited primarily within existing road rights-of-way or utility corridors. Similarly, the Potrero Road subsurface slant wells (Alternatives 1 and 5b) would be sited beneath an existing parking lot at the western terminus of Potrero Road. Road rights-of-way do not have land use or zoning designations in Monterey County; nor does the Potrero Road parking. Nevertheless, because all pipelines and subsurface slant wells would be buried below ground surface, none would have the opportunity to conflict with existing land use or zoning designations.
- The existing caisson at Sandholdt Road that would be utilized for an intake pump system (Alternative 4) would occur on lands designated for Industrial – Coast Dependent – Light and zoned Light Industrial (LI). The Industrial – Coast Dependent – Light land use designation is intended primarily to support marine-related industry, including fishing, canning, boat storage, and other related support facilities and infrastructure. The pump station would be in keeping with the types of industrial facilities envisioned for this classification. The zoning regulations for LI zoning districts allow public utility facilities with a coastal development permit (Section 20.26.060.X). Public utility facilities include

those for the production, storage, transmission, distribution, and recovery of water, sewage, energy, and other similar utilities (Section 20.06.910).

- The intake pump station on Dolan Road (Alternatives 2 and 3), the desalination plant and other facilities at the East Tank Farm Parcel (Alternative 3), and the desalination plant at Moss Landing Green Commercial Park (Alternative 4), would each occur on lands designated for industrial land uses and zoned for heavy industry (HI). The land use designations for the intake pump station site and Moss Landing Green Commercial Park prioritize coastal-dependent industry; the designation for the East Tank Farm Parcel allows for general heavy industry. Each facility would be in keeping with the envisioned uses for its respective land use classification. The zoning regulations for the HI zoning district allow for public utility facilities with a coastal development permit (20.28.060.U).

5.5.8.2 Direct and Indirect Effects of Proposed Project (Slant Wells at CEMEX)

The proposed project extends from Castroville in the north to the city of Carmel in the south (see **Figure 3-2**) and would include construction of a desalination plant on 25 acres along Charles Benson Road northeast of the City of Marina, up to nine new subsurface slant wells at the CEMEX active mining area, two new wells (ASR-5 and ASR-6) at the existing Seaside Groundwater Basin ASR system, the Carmel Valley Pump Station, and about 21 miles of water conveyance pipelines. The direct and indirect impacts of the proposed project are described in detail in Section 4.8.5.

Impact 4.8-1: Consistency with applicable plans, policies, and regulations related to land use and recreation that were adopted for the purpose of mitigating an environmental effect.

The proposed MPWSP would not be expected to conflict with applicable policies related to land use and recreation that were adopted for the purpose of avoiding or mitigating an environmental effect. Although construction of the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, and the Ryan Ranch–Bishop Interconnection Improvements, and ASR pipelines could affect recreational facilities, any disruptions would be temporary and limited to the construction phase. Therefore, the proposed project would not substantially conflict with plans, policies related to land use or recreation. The impact would be less than significant.

Impact 4.8-2: Disrupt or preclude public access to or along the coast during construction.

The proposed new Transmission Main and optional alignment would intersect three Fort Ord Dunes State Park entrances. The effects of the new Transmission Main construction on vertical and lateral public accessways within Fort Ord Dunes State Park would be significant. **Mitigation Measure 4.9-1**, **Traffic Control and Safety Assurance Plan**, which would require the implementation of a traffic control safety plan for project construction activities that could affect the public right-of-way, (including roads and trails leading into Fort Ord Dunes State Park), and include measures that would provide for continuity of vehicular, pedestrian, and bicyclist access, would reduce the effects on public access to a less-than-significant level.

Impact 4.8-C: Cumulative impacts related to land use and recreation.

The proposed project would not have a significant contribution to cumulative impacts related to conflicts with plans, policies, and regulations adopted to protect public access or recreational facilities because any effects associated with construction would be temporary and no long-term effects would result. Cumulative effects on coastal public access during construction could be significant if the Fort Ord Dunes Campground project (No. 46 in **Table 4.1-2**) was constructed at the same time as the new Transmission Main, but the proposed project's contribution to this impact would be reduced to a less-than-significant level with implementation of the mitigation measure identified in Impact 4.8-2.

5.5.8.3 Direct and Indirect Effects of No Project Alternative

Under the No Project Alternative, no new facilities would be constructed or operated and the existing test slant well would be decommissioned. Consequently, there would be no construction- or operations-related impacts on land use, land use planning, or recreation associated with the No Project Alternative. Because the No Project Alternative would have no direct or indirect impacts with respect to land use, land use planning, or recreation, it could not contribute to cumulative effects related to these topics.

5.5.8.4 Direct and Indirect Effects of Alternative 1 – Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.4.3). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**). Therefore, the impact analysis of Alternative 2 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 2.

Construction Impacts

Similar to the proposed project, and based upon an initial review of consistency, components of Alternative 1 that are common with the proposed project would not be expected to conflict with applicable land use policies related to land use and recreation that were adopted for the purpose of avoiding or mitigating an environmental effect. Although construction of the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, Ryan Ranch–Bishop Interconnection Improvements, and ASR pipelines could affect recreational facilities, any disruptions would be temporary and limited to the construction phase.

Alternative 1 facilities at Potrero Road would also be subject to the Salinas River State Beach General Plan. The subsurface slant wells and Source Water Pipeline are coastal-dependent land uses because they depend upon proximity to the coast in order to function. These facilities would generally occur in areas without land use or zoning regulations and would be permissible on adjacent lands with a coastal development permit (CDP). Subsurface slant well and pipeline construction activities, including vehicle ingress and egress, equipment and materials staging, trenching, and stockpiling, would disrupt public access and recreational opportunities in the coastal zone through increased traffic and potential lane closures, and through the temporary closure of the Potrero Road parking lot and coastal access. During the 24-month construction period, travel to or along the coast could take longer than usual and parking options for Salinas River State Beach visitors would be limited to two of three existing options (Sandholdt Road lot or Monterey Dunes Way lot). These effects would be limited to the construction period and alternative recreational beach access opportunities in the area would remain open. For these reasons, components unique to Alternative 1 would not result in conflicts with plans, policies or regulations related to land use or recreation. Additional discussion of traffic and transportation is provided in Section 5.5.9. Public beach access is discussed further below.

Therefore, Alternative 1 would not conflict with plans and policies related to land use or recreation adopted for the purpose of avoiding or mitigating an environmental effect, and would result in the ***same impact conclusion*** as the proposed project, less than significant.

Alternative 1 would result in construction-related impacts on public access to or along the coast for the new Transmission Main. However, with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

The Alternative 1 subsurface slant well installation would require complete closure of the Potrero Road parking lot for the 24-month construction period and closure of the parking lot would temporarily disrupt public access to the shore at that location. Nearby alternative beach access opportunities at the end of Sandholdt Road (approximately 0.6 mile north) and Monterey Dunes Way (approximately 1 mile south) would remain open. However, because existing vertical access from Potrero Road would be precluded, the effect would result in an increased level of impact on recreational access compared to the proposed project. However, implementation of **Mitigation Measures ALT 1-REC-1a** (**Public Notification)** and **ALT 1-REC-1b** (**Beach Access Management Plan**), listed below, would reduce impacts to less than significant. These measures provide for the maintenance of existing public access where feasible and safe, posting of public notice in advance of any closures, and the development of a plan for managing public safety in and around the work areas and accessways. Lateral public access seaward of the Potrero Road parking lot would remain open and unimpeded.

Mitigation Measures ALT 1-REC-1a and ALT 1-REC-1b apply to the Alternatives 1 and 5b work at the Potrero Road parking lot and Alternative 4 beach construction and would not apply to the proposed project or other alternatives.

Mitigation Measure ALT 1-REC-1a: Public Notification.

Two weeks prior to construction, CalAm shall post signs notifying the public of the dates of construction operations and locations of beach or beach access closure. The signs shall be printed on weather-proof materials and posted at public access points and other highly visible locations for the duration of the closure period. In addition, the signs shall include a map showing the nearest alternative access point. At the end of the closure period, CalAm or its contractors shall retrieve all notice materials.

Mitigation Measure ALT 1-REC-1b: Beach Access Management Plan.

Prior to commencement of construction activities, CalAm shall submit a Beach Access Management Plan to the CPUC, MBNMS, and California State Parks Department for review and approval. The Beach Access Management Plan shall provide for maintenance of clear public access routes through to the beach, such that physical construction interference shall be kept to a minimum. The plan shall describe the strategies that the construction contractor(s) will employ during construction to maintain beach access to the maximum extent feasible while ensuring public safety. As appropriate, the plan shall include, but not be limited to: construction fencing, signs, use of enclosed storage areas, construction and construction worker vehicle parking and access routes, and nightly removal of equipment to a designated area. CalAm shall ensure that its construction contractor(s) implement the provisions of the approved plan throughout construction at the Potrero Road parking lot. CalAm shall also provide the public with contact information in order to report immediate hazards related to the project. This information shall be provided in a public notice posted on-site prior to the commencement of any project-related activity.

Therefore, Alternative 1 would have a greater potential to disrupt recreational access than the proposed project, but after implementation of the mitigation measures above, would result in the ***same impact conclusion*** as the proposed project during construction, less than significant with mitigation.

Operational and Facility Siting Impacts

Alternative 1 would not result in any above-ground facilities that would permanently affect coastal public access. The above-ground facilities proposed within the Coastal Zone at Potrero Road would be relatively small and would not block public access to the beach. No other project components have the potential to permanently affect public access. Therefore, Alternative 1 would result in the ***same impact conclusion*** on land use and recreation as the proposed project, less than significant.

Cumulative Analysis

No facility siting and operations-period effects would occur that could contribute to cumulative effects. Therefore, the geographic scope of analysis for cumulative impacts related to land use and recreation for Alternative 1 is defined by the lands and recreational resources that would be affected by Alternative 1 construction, and is the same as that described for the proposed project in Section 4.2.6, with the exception of the different location of the intake system (Potrero Road, instead of CEMEX), and alternative source water pipeline route. Concurrent construction and operation of Alternative 1 and projects in the cumulative scenario, including the DeepWater Desal Project (No. 34 in **Table 4.1-2** in Section 4.1), would increase the duration and geographic extent of recreational access disruptions within the study area. The impacts of Alternative 1 on recreational access and access to the shore at the Potrero Road location would be significant, and if other projects were to affect recreational or public shore access concurrently, the cumulative impact would be significant and the contribution of Alternative 1 would be significant. With implementation of **Mitigation Measures 4.9-1**, **ALT 1-REC-1a**, and **ALT 1-REC-1b**, this contribution and overall impact would be reduced to a level that is less than significant. Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

5.5.8.5 Direct and Indirect Effects of Project Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a new, screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to Castroville Community Services District would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**). Therefore, the impact analysis of Alternative 2 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 2.

Construction

Based upon an initial review of consistency, components of Alternative 2 that are common with the proposed project would only have temporary effects during construction activities, and would not be expected to conflict with applicable land use policies related to land use and recreation that were adopted for the purpose of avoiding or mitigating an environmental effect. Facilities in Moss Landing that are unique to Alternative 2 would be subject to the Moss Landing Community Plan. The effects of components unique to Alternative 2 are presented below.

- The intake structure, intake pump station, and the Source Water Pipeline are coastal-dependent land uses, because they depend upon proximity to the coast in order to function. The intake structure and pipelines would generally occur in areas without land use or zoning regulations and would be permissible on adjacent lands with a CDP. The intake pump station would occur on a site reserved for heavy industrial uses, where public utility facilities are permissible with a CDP.
- Intake pump station and pipeline construction activities, including vehicle ingress and egress, equipment and materials staging, trenching, and stockpiling, would disrupt public access and recreational opportunities in the coastal zone through increased traffic and potential lane closures. During the construction period, travel to or along the coast could take longer than usual. Similarly, recreational boating and other open-water recreational activities in MBNMS could be disrupted in the vicinity of offshore barges during intake structure construction (approximately 1,300 feet offshore). These effects would be limited to the construction period and would not preclude other public access or recreational opportunities in the area. For these reasons, components unique to Alternative 2 would not

result in conflicts with plans, policies or regulations related to land use or recreation. Additional discussion of traffic and transportation is provided in Section 5.5.9. Public beach access is discussed further below.

Installation of the intake structure, intake pump station at Dolan Road, and the additional length of pipeline would not conflict with plans and policies related to land use or recreation that were adopted for the purpose of avoiding or mitigating an environmental effect, and overall Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant.

There are other facilities unique to Alternative 2 that would substantially disrupt or preclude public shoreline access. Construction-related impacts on public access to or along the coast for the new Transmission Main would result in the same significant impact. However with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

Alternative 2 would not result in any above-ground facilities that would conflict with plans and policies related to land use or recreation that were adopted for the purpose of avoiding or mitigating an environmental effect, and would not affect coastal public access. Therefore, Alternative 2 would result in the ***same impact conclusion*** on land use and recreation as the proposed project, less than significant.

Cumulative Analysis

No facility siting and operations-period effects would occur that could contribute to cumulative effects. Therefore, the geographic scope of analysis for cumulative impacts related to land use and recreation for Alternative 2 is defined by the lands and recreational resources that would be affected by Alternative 2 construction, and is the same as that described for the proposed project in Section 4.2.6, with the exception of the different location of the seawater intake system (Moss Landing), and alternative source water pipeline route. Concurrent construction and operation of Alternative 2 and projects in the cumulative scenario, including the DeepWater Desal Project (No. 34 in **Table 4.1-2** in Section 4.1), would increase the duration and geographic extent of recreational access disruptions within the study area. The impacts of Alternative 2 on recreational access would be significant, and if other projects were to affect recreational access concurrently, the cumulative impact would be significant and the contribution of Alternative 2 would be cumulatively significant. With implementation of **Mitigation Measure 4.9-1**, this contribution would be reduced to a level that is less than significant. Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

5.5.8.6 Direct and Indirect Effects of Project Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The pipelines for the intake and discharge systems would be installed using HDD. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-3**, ASR 5 and 6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**). Therefore, the impact analysis of Alternative 3 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 3.

Construction

Similar to the proposed project, and based upon an initial review of consistency, effects from construction of components of Alternative 3 that are common with the proposed project would be temporary, and therefore would not be expected to conflict with applicable land use policies related to land use and recreation that were adopted for the purpose of avoiding or mitigating an environmental effect. Alternative 3 facilities in Moss Landing would also be subject to the Moss Landing Community Plan. The effects of components unique to Alternative 3 are presented below.

- The proposed screened open water intake and brine disposal structures in MBNMS, the intake pump station, the source water pipeline, and the brine discharge pipeline are coastal-dependent land uses because they depend upon proximity to the coast in order to function. The intake/outfall structures and pipelines would generally occur in areas without land use or zoning regulations and would be permissible on adjacent lands with a CDP. The intake pump station would occur on a site reserved for heavy industrial uses, where public utility facilities are permissible with a CDP. The East Tank Farm Parcel land use and zoning designations allow public utility facilities and other industrial-type facilities with a CDP.

- Intake pump station, pipelines, and East Tank Farm Parcel facilities construction activities, including vehicle ingress and egress, equipment and materials staging, trenching, and stockpiling, would disrupt public access and recreational opportunities in the coastal zone through increased traffic and potential lane closures. During the 24-month construction period, travel to or along the coast could take longer than usual. Similarly, recreational boating and other open-water recreational activities could be disrupted in the vicinity of offshore barges during intake/outfall construction (approximately 1,300 feet offshore). These effects would be limited to the construction period and would not preclude other public access or recreational opportunities in the area. For these reasons, components unique to Alternative 3 would not result in conflicts with plans, policies or regulations related to land use or recreation. Additional discussion of traffic and transportation is provided in Section 5.5.9. Public beach access is discussed further below.

Installation of the intake/outfall, intake pump station and East Tank Farm Parcel facilities along Dolan Road, and the additional length of pipelines would not conflict with plans and policies related to land use or recreation and would be compatible with existing land use and zoning designations. Therefore, Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Similar to the proposed project, construction-related impacts on public access to or along the coast would be significant for the new Transmission Main. Facilities unique to Alternative 3 would not preclude public shoreline access but would disrupt public access and recreational opportunities in the coastal zone during the 24-month construction period through increased traffic and potential lane closures; travel to or along the coast could take longer than usual. Similarly, recreational boating and other open-water recreational activities could be disrupted in the vicinity of offshore barges during intake/outfall construction (approximately 1,300 feet offshore). With implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), Alternative 3 would result in the ***same impact conclusion*** on coastal public access as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

Alternative 3 would not result in any above-ground facilities that would conflict with plans and policies related to land use or recreation that were adopted for the purpose of avoiding or mitigating an environmental effect, and would not affect coastal public access. Therefore, Alternative 3 would have the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

No facility siting and operations-period effects would occur that could contribute to cumulative effects. Therefore, the geographic scope of analysis for cumulative impacts related to land use and recreation for Alternative 3 is defined by the lands and recreational resources that would be affected by Alternative 3 construction. Concurrent construction and operation of Alternative 3 and projects in the cumulative scenario, including the GWR Project (No. 59 in **Table 4.1-2** in Section 4.1), would increase the duration and geographic extent of land use and recreational access impacts within the study area. The impacts of Alternative 3 on recreational access and recreational boating during construction would be significant, and if other projects were to affect recreational access concurrently, the cumulative impact would be significant and the contribution of Alternative 3 would be cumulatively significant. With implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), this contribution would be reduced to a level that is less than significant. Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

5.5.8.7 Direct and Indirect Effects of Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**). Therefore, the impact analysis of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4.

Construction

Similar to the proposed project, and based upon an initial review of consistency, effects from construction of components of Alternative 4 that are common with the proposed project would be temporary, and therefore would not be expected to conflict with applicable land use policies related to land use and recreation that were adopted for the purpose of avoiding or mitigating an environmental effect. Facilities in Moss Landing that are unique to Alternative 4 would also be subject to the Moss Landing Community Plan. The effects of components unique to Alternative 4 are presented below.

- The screened open water intake, the brine discharge structure and the use of the existing caisson at the end of Sandholdt Road along with the desalinated water pipeline, source water pipeline and outfall pipeline, are all coastal-dependent land uses, because they depend upon proximity to the coast in order to function. The pipelines would generally occur in areas without land use or zoning regulations and would be permissible on adjacent lands with a CDP. The intake pump system would occur on a site reserved for light industrial uses, where public utility facilities are permissible with a CDP. The Heavy Industrial zoning designation for the Moss Landing Green Commercial Park, on which the desalination facility would be built, also allows for public utility facilities and water system facilities with a CDP. However, the site's land use plan designation prioritizes coastal-dependent uses. A desalination plant (as opposed to an intake structure) may or may not be considered a coastal-dependent land use. Such a determination would be made by the appropriate regulatory body (e.g., Monterey County and/or California Coastal Commission) at time of permitting. If the use is found to not be coastal-dependent, a variance or other exception would be required for the Alternative 4 desalination plant to gain CDP approval at the proposed location.

- Activities associated with construction of the intake pump system, pipelines, and Moss Landing Green Commercial Park facilities, including vehicle ingress and egress, equipment and materials staging, trenching, and stockpiling, would disrupt public access and recreational opportunities in the coastal zone through increased traffic and potential lane closures. During the construction period, travel to or along the coast could take longer than usual. Similarly, recreational boating and other open-water recreational activities could be disrupted in the vicinity of offshore barges during intake/outfall construction (approximately 300 to 1,400 feet offshore). These effects would be limited to the construction period and would not preclude public access or recreational opportunities in the area. For these reasons, components unique to Alternative 4 would not result in substantial conflicts with plans, policies or regulations related to land use or recreation. Additional discussion of traffic and transportation is provided in Section 5.5.9. Public beach access is discussed further below.

Installation of the intake/outfall structures, the intake pump station on top of the existing caisson, the desalination plant, and the additional length of pipelines would not conflict with plans and policies related to land use or recreation that were adopted for the purpose of avoiding or mitigating an environmental effect. Overall, construction of Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Construction-related impacts on public access to or along the coast would be significant for the new Transmission Main, and with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

The public beach access effects of components unique to Alternative 4 are presented below.

- The existing caisson that would be used for the intake pump station is located between Moss Landing Beach and Sandholdt Road and could require construction access from the beach. The beach is generally narrow at this location and would not likely accommodate both on-beach construction and public access. If beach construction were to be required, lateral public access would likely be precluded. The effect would be significant. With implementation of feasible mitigation, such as that described in **Mitigation Measures ALT 1-REC-1a** (**Public Notification**) and **ALT 1-REC 1b** (**Beach Access Management Plan**), the significant impact would be reduced to a less-than-significant level. Nearby alternative lateral beach access opportunities would remain open.

The effects of Alternative 4 on coastal public access would be increased compared to the proposed project because the construction activities associated with the rehabilitation of the existing caisson and construction of the new pump house would temporarily preclude lateral public access along the shoreline during the 24-month construction period. Implementation of feasible mitigation, such as measures described in **Mitigation Measures ALT 1-REC-1a** and **ALT 1-REC-1b** would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

Alternative 4 would not result in any above-ground facilities that would conflict with plans and policies related to land use or recreation that were adopted for the purpose of avoiding or mitigating an environmental effect, and would not affect coastal public access. Therefore, Alternative 4 would have the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

No facility siting and operations-period effects would occur that could contribute to cumulative effects. Therefore, the geographic scope of analysis for cumulative impacts related to land use and recreation for Alternative 4 is defined by the lands and recreational resources that would be affected by Alternative 4 construction. Concurrent construction and operation of Alternative 4 and projects in the cumulative scenario, including the DeepWater Desal Project (No. 34 in **Table 4.1-2** in Section 4.1), would increase the duration and geographic extent of recreational access disruptions within the study area. The impacts of Alternative 4 on recreational access and access to the shore at Moss Landing would be significant, and if other projects were to affect recreational or public shore access concurrently, the cumulative impact would be significant and the contribution of Alternative 4 would be cumulatively significant. With implementation of **Mitigation Measures 4.9-1**, **ALT 1-REC-1a**, and **ALT 1-REC-1b**, this contribution would be reduced to a level that is less than significant. Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

5.5.8.8 Direct and Indirect Effects of Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction

Because Alternative 5a facilities would be constructed in the same areas as the proposed project, Alternative 5a would temporarily disrupt public access and recreational facilities, but would not conflict with applicable regulatory requirements related to land use or recreation adopted for the purpose of avoiding or mitigating an environmental effect, and Alternative 5a facilities would be similarly compatible with existing land use and zoning designations as the proposed project. Impacts of Alternative 5a would, therefore, result in the ***same impact conclusion*** as the proposed project, less than significant.

The effects of Alternative 5b would be the same as described for Alternative 1. Installation of fewer subsurface slant wells at Potrero Road would not disturb any less area than Alternative 1 since the parking lot is so small, and the construction of the additional length of pipeline from the slant well intakes would not result in a potential conflict with applicable plans, policies, and regulations related to land use and recreation adopted for the purpose of avoiding or mitigating an environmental effect. Therefore, Alternative 5b would have result in the ***same impact conclusion*** as the proposed project, less than significant.

The public shoreline access effects of Alternative 5a would in the same as the proposed project and with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), Alternative 5a would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

The public shoreline access effects of Alternative 5b would be the same as described for Alternative 1. Impacts associated with the subsurface slant wells at Potrero Road would be increased compared to the proposed project, because construction would require the complete closure of the Potrero Road parking lot and trails, which would temporarily preclude vertical public access to the shore and MBNMS during the 24-month construction period. However, with implementation of **Mitigation Measures ALT 1-REC-1a** and **ALT 1-REC-1b**, Alternative 5b would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

Alternatives 5a and 5b would not result in any above-ground facilities that would conflict with plans and policies related to land use or recreation that were adopted for the purpose of avoiding or mitigating an environmental effect, and would not affect coastal public access. Therefore, Alternatives 5a and 5b would have the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

Combined Impacts with GWR Project

The GWR Project (No. 59 in **Table 4.1-2** in Section 4.1) would not affect vertical or lateral public access to the shore. Therefore, it would not have impacts that could combine with those of Alternative 5a or 5b; combined impacts would be as described for Alternatives 5a and 5b, above.

Impacts of Full Cumulative Scenario

The geographic scope of impacts and the cumulative scenario relevant to Alternatives 5a and 5b would be as described for the proposed project and Alternative 1, respectively, with the exception that the GWR Project also would be relevant to the cumulative scenario. As noted above, the GWR Project would not contribute to the same potential cumulative effects to which Alternatives 5a and 5b would contribute. Therefore, cumulative impacts would be identical to those described for the proposed project and Alternative 1, and with mitigation identified in those analyses, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

5.5.9 Traffic and Transportation

The evaluation criteria for Traffic and Transportation address: temporary traffic increases on regional and local roadways from construction vehicle trips; temporary reduction in roadway capacities and increased traffic delays during construction, increased traffic safety hazards during construction; impaired emergency access during construction; temporary disruptions to public transportation, bicycle, and pedestrian facilities during construction; construction vehicle related wear-and-tear on designated haul routes; parking interference during construction; and, long-term traffic increases on regional and local roadways during operation and maintenance. Construction of all facilities would require the use of equipment and vehicles that would travel on local and regional roadways in Monterey County. Pipeline installation could also occupy roadways.

5.5.9.1 Setting/Affected Environment

The components of the alternatives that are common to the proposed project are located south of the Nashua Road/Highway 1 intersection and the setting/affected environment for those facilities is described in Section 4.9, Traffic and Transportation. The setting for the components north of the Nashua Road/Highway 1 intersection is presented in **Table 5.5-12**, which provides roadway characteristics for additional roads that would be affected by the alternatives (i.e., installation of pipelines within road rights-of-way).

TABLE 5.5-12
CHARACTERISTICS OF ADDITIONAL ROADS THAT COULD BE DIRECTLY AFFECTED BY PROJECT CONSTRUCTION ACTIVITIES

Roadway / Segment	No. of Travel Lanes	Average Daily Traffic Volumes[b]	Bike Route?	On-Street Parking?	Public Transit Lines[c]	Figure Reference
Source Water Pipeline (Alternatives 1 and 2) New Desalinated Water Pipeline (Alternatives 3, 4, and 5b)						
Potrero Road: • Highway 1 to Beach parking lot	2 lanes	--	No	No	N/A	Figure 5.4-3
Molera Road • Highway 1 (north) to Highway 1 (south)	2 lanes	--	No	No	N/A	Figure 5.4-3
Nashua Road • Highway 1 to Monte Road	2 lanes	--	No	No	N/A	Figure 5.4-3
New Desalinated Water Pipeline (Alternative 3)						
Dolan Road • Highway 1 to Moss Landing Power Plant East Parcel	2 lanes	--	No	No	N/A	Figure 5.4-5

5.5.9.2 Direct and Indirect Effects of the Proposed Project – Slant Wells at CEMEX

As described in detail in Chapter 3, Description of the Proposed Project, the proposed project (see **Figure 3-2**) would include construction of a desalination plant on 25 acres along Charles Benson

Road northeast of the City of Marina, up to nine new subsurface slant wells at the CEMEX active mining area, and conversion of the existing test slant well to a permanent well. The proposed project would also include improvements to the existing Seaside Groundwater Basin aquifer storage and recovery (ASR) system facilities, pump stations, storage tanks, and about 21 miles of new water conveyance pipelines. No construction or placement of facilities on the seafloor would occur.

The following paragraphs briefly summarize the impacts of the proposed project with respect to traffic and transportation. The detailed impact analysis of the proposed project is provided in Section 4.9.

Impact 4.9-1: Temporary traffic increases on regional and local roadways due to construction-related vehicle trips.

Project-related construction activities would result in a temporary increase in traffic from construction workers and trucks traveling to and from the construction work areas. Although the estimated maximum increase in traffic along regional roadways would remain within the carrying capacities of the regional roadways and would not substantially affect traffic flow, construction-related traffic increases along local and neighborhood (residential) streets could result in adverse traffic conditions; this impact would be less than significant for all project components located north of Reservation Road and for the Carmel Valley Pump Station. This impact would be potentially significant for the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, ASR-5 and ASR-6 Wells, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements. Implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**) would reduce this potentially significant impact to a less-than-significant level.

Impact 4.9-2: Temporary reduction in roadway capacities and increased traffic delays during construction.

Traffic delays resulting from temporary lane closures and detours would be a potentially significant impact for all of the proposed pipelines, but implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**) would reduce the impact to a less-than-significant level. For all other proposed facilities, the impact would be less than significant because none of the non-linear facilities would require temporary lane closures or detours.

Impact 4.9-3: Increased traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways during construction.

For all proposed project facilities, construction activities could increase traffic safety hazards in the project area due to conflicts among construction vehicles, automobiles, bicyclists, and pedestrians using the roadways; traffic issues on public roadways near construction vehicle access points; and confused bicyclists and pedestrians during temporary changes in circulation patterns on recreational trails, bicycle routes, sidewalks, and other public walkways. Potential increases in traffic safety hazards during project construction would be a potentially significant impact. Implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**) would reduce this impact to a less-than-significant level.

Impact 4.9-4: Impaired emergency access during construction.

Pipeline installation activities could require construction within vehicle travel lanes and road shoulders that could temporarily reduce travel lanes and roadway capacity. Delays for emergency vehicles and disruptions of emergency vehicle access to adjacent land uses would result in a potentially significant impact. Implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), which contains provisions to maintain access during construction, would reduce the impact to a less-than-significant level.

Construction activities and staging areas for the subsurface slant wells, MPWSP Desalination Plant, ASR-5 and ASR-6 Wells, and Carmel Valley Pump Station are not expected to require construction in roadways or road shoulders and impacts related to disrupted access to adjacent land uses for emergency vehicles would be less than significant.

Impact 4.9-5: Temporary disruptions to public transportation, bicycle, and pedestrian facilities during construction.

Pipeline installation activities of the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, and Castroville Pipeline, including vehicle ingress and egress, equipment and materials staging, trenching, and stockpiling, could temporarily affect public transportation, bicycle travel, and pedestrian travel along affected roadways and recreational trails in the project area. Construction-related impacts on alternative transportation modes and facilities during pipeline installation activities would be potentially significant. Implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), which includes measures to minimize impacts on public transportation and provide for continuity of pedestrian and bicyclist traffic during construction, would reduce the impact to a less-than-significant level. There would be no impacts on public transportation and bicycle and pedestrian facilities from the construction of all other proposed facilities and pipelines.

Impact 4.9-6: Increased wear-and-tear on the designated haul routes used by construction vehicles.

The use of trucks to transport equipment and material to and from the construction work areas could affect road conditions on the designated haul routes by increasing the rate of road wear. The degree to which this impact would occur depends on the roadway design and the existing road condition. Highways 1, 68, 101, 156, 183, and 218, Del Monte Boulevard, and Fremont Boulevard / Fremont Street are designed to handle a mix of vehicle types, including heavy trucks; therefore, the impacts of project-related construction traffic are expected to be negligible on those roads. However, some of the smaller roadways and residential streets may not have been constructed to support use by heavy construction trucks and vehicles, and project-related increases in construction truck trips could cause excessive wear-and-tear on these roadways, a potentially significant impact. Implementation of **Mitigation Measure 4.9-6** (**Roadway Rehabilitation Program**), which requires rehabilitation of any roadways damaged following construction, would reduce this impact to a less-than-significant level.

Impact 4.9-7: Parking interference during construction.

Use of public parking lots for construction staging areas would result in potentially significant parking impacts due to temporary increases in parking demand associated with construction worker vehicles and/or temporary displacement of parking spaces. Implementation of **Mitigation Measure 4.9-7** (**Construction Parking Requirements**) would reduce this impact to a less-than-significant level. Construction activities for the subsurface slant wells and MPWSP Desalination Plant would have no effect on parking. Parking displacement impacts resulting from construction of the proposed ASR-5 and ASR-6 Wells, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and all other proposed pipelines would be less than significant.

Impact 4.9-8: Long-term traffic increases on regional and local roadways during project operations and maintenance.

The impact related to long-term increases in vehicle trips during project operations and maintenance is less than significant for all project facilities due to the low volumes of daily trips that would be generated by the project.

Impact 4.9-C: Cumulative impacts related to traffic and transportation.

Proposed project construction would have a significant contribution to cumulative traffic and transportation impacts, even with implementation of mitigation measures identified in Impacts 4.9-1 through 4.9-7. Implementation of a mitigation measure designed to further reduce the MPWSP's incremental contribution to cumulative impacts, **Mitigation Measure 4.9-C** (**Construction Traffic Coordination Plan**), proposes coordination among planning agencies in each affected jurisdiction to develop and implement a Construction Traffic Coordination Plan to address construction-related traffic associated with all concurrent project sites in the vicinity of MPWSP project components. Since there is no guarantee that local agencies would participate in such coordination efforts, the proposed project's incremental contribution would be a significant and unavoidable impact. Project operations would result in a less than significant contribution to cumulative traffic and transportation-related impact.

5.5.9.3 Direct and Indirect Effects of No Project Alternative

Under the No Project Alternative, no new facilities would be constructed and the existing test slant well would be decommissioned. Consequently, there would be no construction or operational impacts on traffic and transportation. Because the No Project Alternative would have no direct or indirect impacts with respect to traffic and transportation, it could not contribute to cumulative effects related to these topics.

5.5.9.4 Direct and Indirect Effects of Alternative 1 – Slant Wells at Potrero Road

Alternative 1 would site the subsurface intake system at a different location (Potrero Road parking lot), which would require an additional 5.5 miles of source water pipeline. The desalination plant at Charles Benson Road, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 Interconnection Improvements, and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**). Therefore, the traffic and transportation impact analysis of Alternative 1 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 1.

Construction Impacts

All construction activities and disturbance for the slant wells would occur in the parking lot at the western terminus of Potrero Road in northern Monterey County, near the southern border of the unincorporated community of Moss Landing. The Potrero Road beach parking lot is owned and operated by the California Department of Parks and Recreation (California State Parks) and the 10 slant wells would be buried 5 feet below the hardened sand parking surface. The approximately 4-foot-wide, 12-foot-long, and 6-foot-high electrical control building, the only above-ground structure at this location, would be located at the edge of the parking lot.

Similar to the proposed project, construction-related traffic would access the work areas using the roads described in Section 4.9 for components similar to the proposed project, except for Alternative 1 facilities located north of Charles Benson Road which would be accessed from the roads listed in **Table 5.5-12**. Similar to the proposed project, construction of Alternative 1 would temporarily affect segments of the roadway network in the project area including roads used for recreation and coastal access by: increasing traffic volumes and congestion; introducing temporary lane closures and detours; increasing traffic safety hazards; reducing roadway capacity; affecting public transportation, bicycle travel, and pedestrian travel along affected roadways and recreational trails; and increasing the rate of road wear.

Construction-related vehicle traffic could result in increased congestion and delays for vehicles on some roadway segments because the source water pipeline for Alternative 1 would be 5.5 miles longer compared to the proposed project and because the longer pipeline would take longer to install it would result in an increased number of vehicle trips. The additional roads affected by construction of the longer source water pipeline and the closure of the beach access parking lot at Potrero Road during the 24-month construction period, would result in traffic directed to other access roads in the area. Alternative 1 would result in an increased potential for regional and local roadway congestion compared to the proposed project, but with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**) would result in the ***same impact conclusion*** as the proposed project related to increased traffic congestion, less than significant with mitigation.

Construction associated with the longer source water pipeline would result in additional activities in vehicle travel lanes and road shoulders compared to the proposed project. These lane closures and detours would temporarily result in traffic delays during construction of Alternative 1 greater than the proposed project due to additional length of construction and additional roadways used. However, with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety**

Assurance Plan) Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Construction activities could increase traffic safety hazards in the project area due to conflicts between haul trucks and other large construction vehicles, automobiles, bicyclists, and pedestrians using the roadways and impedance of bicycle and pedestrian circulation. Potential increases in traffic safety hazards during construction of Alternative 1 would be increased compared to the proposed project because of the longer source water pipeline. However, with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Temporary reductions in travel lanes and roadway capacity to accommodate the construction work areas (for pipeline installation) for Alternative 1 could result in an increase in delays for emergency vehicles, and temporary disruption of emergency vehicle access to adjacent land uses compared to the proposed project. However, with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), Alternative 1 would result in the ***same impact conclusion*** as the proposed project, to less than significant with mitigation.

Pipeline installation activities for Alternative 1 could temporarily affect public transportation, bicycle travel, and pedestrian travel along affected roadways and recreational trails in the project area. Construction-related impacts on alternative transportation modes and facilities during pipeline installation activities would be potentially increased compared to the proposed project. However, with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

The use of trucks to transport equipment and material to and from the construction work areas could affect road conditions on the designated haul routes by increasing the rate of road wear. Alternative 1 would result in an increase in construction truck trips that could cause excessive wear-and-tear on potentially more roadways compared to the proposed project. However, with implementation of **Mitigation Measure 4.9-6** (**Roadway Rehabilitation Program**), Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Construction in the Potrero Road beach parking lot would result in potentially significant parking impacts due to temporary increases in parking demand associated with construction worker vehicles and/or temporary displacement of parking spaces. Alternative 1 would result in an increase in construction in parking interference compared to the proposed project. With the implementation of **Mitigation Measure 4.9-7 (Construction Parking Requirements)** Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Overall, construction of Alternative 1 could have a potential increase in effects on traffic and transportation compared to the proposed project because of the additional 5.5 miles of source water pipeline. However, Alternative 1 impacts would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

The impacts of components that are common with the proposed project (i.e., the desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and Carmel Valley Pump Station) would be identical to the impacts identified for proposed project, as summarized above in Section 5.5.9.2 (additional details in Section 4.9). The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the only components unique to Alternative 1 (see **Figure 5.4-1**) and the operation and maintenance activities would be the same as the proposed project, and the minimal number of daily vehicle trips associated with worker commutes and deliveries would be negligible compared to existing conditions and would not result in a noticeable increase in traffic on adjacent streets. Therefore, Alternative 1 would result in the ***same impact conclusion*** on long-term traffic as the proposed project, less than significant.

Cumulative Analysis

For the same reasons discussed in Section 4.9, Traffic and Transportation, there is no discussion in the alternatives analysis of the cumulative impact of conflicts with an applicable congestion management plan, changes in air traffic patterns, permanent increases in traffic safety hazards, or conflicts with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities.

The geographic scope for the cumulative traffic impacts analysis for Alternative 1 is the same as for the proposed project, described in Section 4.9.6. Due to increased traffic and transportation network disruptions, concurrent construction of Alternative 1 and the projects listed in **Table 4.1-2** in Section 4.1 would result in potentially significant cumulative impacts on traffic and transportation access and facilities, similar to those of the proposed project.

Based on the assumption that long-term vehicle trips generated by Alternative 1 would be similar to those generated by the proposed project, operations and maintenance activities for Alternative 1 would have similar impacts on regional and local roadways as the proposed project, and therefore would result in a less than significant cumulative impact.

Similar to the proposed project, for Alternative 1, CalAm would be required to implement **Mitigation Measures 4.9-1** (**Traffic Control and Safety Assurance Plan**), **4.9-6** (**Roadway Rehabilitation Program**), and **4.9-7** (**Construction Worker Parking Requirements**), discussed in Sections 4.9.4 and 4.9.5, each of which would lessen Alternative 1’s contribution to cumulative construction-related traffic and transportation impacts. **Mitigation Measure 4.9-C** (**Construction Traffic Coordination Plan**) is designed to further reduce the MPWSP’s (and Alternative 1’s) incremental contribution to address the potential significant cumulative impact. However, even though this mitigation measure could reduce Alternative 1’s cumulative contribution to a less-than-significant level, the conclusion remains that the incremental contribution to potential significant and unavoidable cumulative effects would be cumulatively significant, for the same reasons described for the proposed project. Therefore, Alternative 1 would have the *same impact conclusion* as the proposed project for cumulative construction effects related to traffic and transportation, significant and unavoidable.

5.5.9.5 Direct and Indirect Effects of Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water that originated from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to Castroville Community Services District would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**).

Construction Impacts

Similar to the proposed project, construction-related traffic would access the work areas using the roads described in Section 4.9 for components similar to the proposed project, except for Alternative 2 facilities located north of Charles Benson Road which would be accessed from the roads listed in **Table 5.5-12**. Similar to the proposed project, construction of Alternative 2 would temporarily affect segments of the roadway network in the project area including roads used for recreation and coastal access by: increasing traffic volumes and congestion; introducing temporary lane closures and detours; increasing traffic safety hazards; reducing roadway capacity; affecting public transportation, bicycle travel, and pedestrian travel along affected roadways and recreational trails; and increasing the rate of road wear.

Construction-related vehicle traffic could result in increased congestion and delays for vehicles on some roadway segments compared to the proposed project because the source water pipeline for Alternative 2 would be 6.5 miles longer and because the longer pipeline would take longer to install and would result in an increased number of vehicle trips. The additional roads affected by construction of the longer source water pipeline would result in traffic directed to other access roads in the area. Alternative 2 would result in an increased potential for regional and local roadway congestion compared to the proposed project, but with. implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**) would result in the ***same impact conclusion*** as the proposed project related to increased traffic congestion, less than significant with mitigation.

Construction associated with the longer source water pipeline would also result in additional activities in vehicle travel lanes and road shoulders compared to the proposed project. These lane closures and detours would temporarily result in traffic delays during construction of Alternative 2 that are greater than the proposed project due to additional length of construction and additional roadways used. However, with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Construction activities could increase traffic safety hazards in the project area due to conflicts between haul trucks and other large construction vehicles, automobiles, bicyclists, and pedestrians using the roadways and impedance of bicycle and pedestrian circulation. Potential increases in traffic safety hazards during construction of Alternative 2 would be increased compared to the proposed project because of the longer source water pipeline. However, with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Temporary reductions in travel lanes and roadway capacity to accommodate the construction work areas (for pipeline installation) for Alternative 2 could result in an increase in delays for emergency vehicles, and temporary disruption of emergency vehicle access to adjacent land uses compared to the proposed project. However, with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), Alternative 2 would result in the ***same impact conclusion*** as the proposed project, to less-than-significant with mitigation.

Pipeline installation activities for Alternative 2 could temporarily affect public transportation, bicycle travel, and pedestrian travel along affected roadways and recreational trails in the project area. Construction-related impacts on alternative transportation modes and facilities during pipeline installation activities would potentially increase compared to the proposed project. However, with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

The use of trucks to transport equipment and material to and from the construction work areas could affect road conditions on the designated haul routes by increasing the rate of road wear. Alternative 2 would result in an increase in construction truck trips that could cause excessive wear-and-tear on potentially more roadways compared to the proposed project. However, with implementation of **Mitigation Measure 4.9-6** (**Roadway Rehabilitation Program**), Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Construction of Alternative 2 would not impact on-street parking as shown in **Table 5.5-12**, and it is unknown whether parking lots would be used for construction equipment staging. Therefore, Alternative 2 would have a similar level of impact regarding parking interference as the proposed project, which has the potential to be significant. Implementation of **Mitigation Measure 4.9-6 (Roadway Rehabilitation Program)** would reduce impacts to less than significant. Combining the components unique to Alternative 2 with those in common with the proposed project, Alternative 2 would result in the ***same impact conclusion***, less than significant with mitigation.

Overall, construction of Alternative 2 could have a potential increase in effects on traffic and transportation compared to the proposed project because of the additional 5.5 miles of source water pipeline. However, Alternative 2 impacts would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

The impacts of components that are common with the proposed project (i.e., the desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and Carmel Valley Pump Station) would be identical to the impacts identified for proposed project, as summarized above in Section 5.5.9.2 (additional details in Section 4.9). The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the only components unique to Alternative 2 (see **Figure 5.4-2**), the operation and maintenance activities would be the same as those for the proposed project, and the minimal number of daily vehicle trips associated with worker commutes and deliveries would be negligible compared to existing conditions and would not result in a noticeable increase in traffic on adjacent streets. Therefore, Alternative 2 would result in the ***same impact conclusion*** on long-term traffic as the proposed project, less than significant.

Cumulative Analysis

For the same reasons discussed in Section 4.9, Traffic and Transportation, there is no discussion in the alternatives analysis of the cumulative impact of conflicts with an applicable congestion management plan, changes in air traffic patterns, permanent increases in traffic safety hazards, or conflicts with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities.

The geographic scope for the cumulative traffic impacts analysis for Alternative 2 is the same as for the proposed project. Like Alternative 1, based on the assumption that long-term vehicle trips generated by Alternative 2 would be similar to those generated by the proposed project, operations and maintenance activities for Alternative 2 would have similar impacts on regional and local roadways as the proposed project, and therefore would result in a less than significant cumulative impact.

Alternative 2 would have similar contributions to cumulative construction impacts as described for Alternative 1, and also would be subject to implementation of **Mitigation Measures 4.9-1** (**Traffic Control and Safety Assurance Plan**), **4.9-6** (**Roadway Rehabilitation Program**), **4.9-7** (**Construction Worker Parking Requirements**), and **4.9-C** (**Construction Traffic Coordination Plan**). Similar to the proposed project, even with implementation of mitigation, the incremental contribution of Alternative 2 to potential cumulative effects would be significant. Therefore, Alternative 2 would have the ***same impact conclusion*** as the proposed project for cumulative construction effects related to traffic and transportation, significant and unavoidable.

5.5.9.6 Direct and Indirect Effects of Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, two subsurface pipelines connecting to each the intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The pipelines for the intake and discharge systems would be installed using HDD from the location of the proposed pump station on Dolan Road. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-3**, ASR-5 and 6 wells and ASR pipelines, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water that originated from the Salinas Valley Groundwater Basin, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and co-located data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**). Therefore, the impact analysis of Alternative 3 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 3.

Construction Impacts

Similar to the proposed project, construction-related traffic would access work areas using the roads described in Section 4.9 for components common to the proposed project south of Charles Benson Road, including the Desalinated Water Pipeline, new Transmission Main, and ASR facilities and pipelines. Facilities unique to Alternative 3 that would be located north of Charles Benson Road include: 31.5 additional miles of Desalinated Water Pipeline; the desalination plant and co-located data center on the East Tank Farm parcel; the screened open water intake and brine discharge systems in Monterey Bay within MBNMS; the pump station along Dolan Road at the railspur; the two intake and two brine discharge pipelines in Dolan Road between the pump station and the desalination plant, and; treated water pipelines in Dolan Road to Salinas and Santa Cruz counties.

As a result, Alternative 3 could result in potential increases in construction-related vehicle traffic, congestion and delays for vehicles. For the same reasons described above for Alternative 2, Alternative 3 would result in potentially significant impacts from construction-related traffic, road hazards, emergency vehicle access, public transportation, and road wear. These temporary traffic impacts on regional and local roadways would be increased compared to the proposed project because multiple pipelines would be installed via open-trenching in Dolan Road, which would require full closure of that road during construction work hours. While there is an available detour (via Castroville Boulevard and State Route 156), the resulting impact on traffic would be greater than for the proposed project. However, with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**) and **Mitigation Measure 4.9-6** (**Roadway Rehabilitation Program**), Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Construction of Alternative 3 would not impact on-street parking as shown in **Table 5.5-12**, and it is unknown whether parking lots would be used for construction equipment staging. Therefore, Alternative 3 would have a similar level of impact regarding parking interference as the proposed project, which has the potential to be significant. Implementation of **Mitigation Measure 4.9-6** (**Roadway Rehabilitation Program**) would reduce impacts to less than significant. Combining the components unique to Alternative 3 with those in common with the proposed project, Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Overall, construction of Alternative 3 could have a potential increase in effects on traffic and transportation compared to the proposed project because of the additional 31.5 miles of pipeline. However, Alternative 3 impacts would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

The impacts of components that are common with the proposed project would be identical to the impacts identified for proposed project, as summarized above in Section 5.5.9.2 (additional details in Section 4.9). The location of the intake and outfall pipelines, Desalination Plant, and the additional 31.5 miles of pipeline are the only components unique to Alternative 3 on land (see **Figure 5.4-3**) and the operation and maintenance activities on land would be similar to those for the proposed project, and the minimal number of daily vehicle trips associated with worker commutes and deliveries would be negligible compared to existing conditions and would not result in a noticeable increase in traffic on adjacent streets. Therefore, Alternative 3 would result in the ***same impact conclusion*** on long-term traffic as the proposed project, less than significant.

Cumulative Analysis

For the same reasons discussed in Section 4.9, Traffic and Transportation, there is no discussion in the alternatives analysis of the cumulative impact of conflicts with an applicable congestion management plan, changes in air traffic patterns, permanent increases in traffic safety hazards, or conflicts with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities.

The geographic scope for the cumulative traffic impacts analysis for Alternative 3 is the same as for the proposed project. Like Alternative 1, based on the assumption that long-term vehicle trips generated by Alternative 3 would be similar to those generated by the proposed project, operations and maintenance activities for Alternative 3 would have similar impacts on regional and local roadways as the proposed project, and therefore its contribution to cumulative effects would be less than significant.

Alternative 3 would have similar contributions to cumulative construction impacts as described for Alternative 1, and also would be subject to implementation of **Mitigation Measures 4.9-1** (**Traffic Control and Safety Assurance Plan**), **4.9-6** (**Roadway Rehabilitation Program**), **4.9-7** (**Construction Worker Parking Requirements**), and **4.9-C** (**Construction Traffic Coordination Plan**). Similar to the proposed project, even with implementation of mitigation, the incremental contribution of Alternative 3 to potential cumulative effects would be significant. Therefore, Alternative 3 would have the ***same impact conclusion*** as the proposed project for cumulative construction effects related to traffic and transportation, significant and unavoidable.

5.5.9.7 Direct and Indirect Effects of Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 includes the construction and operation of an open ocean intake system and intake pipeline and a brine discharge system and discharge pipeline including the placement of ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water that originated from the Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**). Therefore, the impact analysis of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4.

Construction Impacts

Similar to the proposed project, construction-related traffic would access the work areas using the roads described in Section 4.9 for components common to the proposed project south of Charles Benson Road, including the Desalinated Water Pipeline, new Transmission Main, and ASR facilities and pipelines Facilities unique to Alternative 4 that would be located north of Charles Benson Road include: 6.5 additional miles of Desalinated Water Pipeline; the desalination plant located at the Moss Landing Green Commercial Park; the screened open water intake and brine discharge systems in Monterey Bay within MBNMS; the pump station at the existing caisson at the end of Sandholdt Road, and; the intake and brine discharge pipelines between the caisson and the desalination plant. For the same reasons described above for Alternative 1, Alternative 4 would result in potentially significant impacts from construction-related traffic, lane closures, road hazards, emergency vehicle access, public transportation, and road wear. However, with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**) and **Mitigation Measure 4.9-6** (**Roadway Rehabilitation Program**), Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Construction of Alternative 4 would not impact on-street parking as shown in **Table 5.5-12**, and it is unknown whether parking lots would be used for construction equipment staging. Therefore, Alternative 4 would have a similar level of impact regarding parking interference as the proposed project, which has the potential to be significant. Implementation of **Mitigation Measure 4.9-6** (**Roadway Rehabilitation Program**) would reduce impacts to less than significant. Combining the components unique to Alternative 4 with those in common with the proposed project, Alternative 4 would result in the ***same impact conclusion***, less than significant with mitigation.

Operational and Facility Siting Impacts

Impacts from components that are common with the proposed project would be identical to the impacts identified for these components in Section 4.2. The location of the intake, discharge, desalination plant and the additional 6.5 miles of desalinated water pipeline are the on land components unique to Alternative 4 (see **Figure 5.4-4**); therefore, the components of Alternative 4 located on land would result in a similar level of impact as the proposed project associated with operation and maintenance activities, and the minimal number of daily vehicle trips associated with worker commutes and deliveries would be negligible compared to existing conditions and would not result in a noticeable increase in traffic on adjacent streets. Therefore, Alternative 4 would have the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

For the same reasons discussed in Section 4.9, Traffic and Transportation, there is no discussion in the alternatives analysis of the cumulative impact of conflicts with an applicable congestion management plan, changes in air traffic patterns, permanent increases in traffic safety hazards, or conflicts with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities.

The geographic scope for the cumulative traffic impacts analysis for Alternative 4 is the same as for the proposed project. Like Alternative 1, based on the assumption that long-term vehicle trips generated by Alternative 4 would be similar to those generated by the proposed project, operations and maintenance activities for Alternative 4 would have similar impacts on regional and local roadways as the proposed project, and therefore would result in a less than significant cumulative impact.

Alternative 4 would have similar contributions to cumulative impacts as described for Alternative 1, and also would be subject to implementation of **Mitigation Measures 4.9-1** (**Traffic Control and Safety Assurance Plan**), **4.9-6** (**Roadway Rehabilitation Program**), **4.9-7** (**Construction Worker Parking Requirements**), and **4.9-C** (**Construction Traffic Coordination Plan**). Similar to the proposed project, even with implementation of mitigation, the incremental contribution of Alternative 4 would be significant. Therefore, Alternative 4 would have the ***same impact conclusion*** as the proposed project for cumulative construction effects related to traffic and transportation, significant and unavoidable.

5.5.9.8 Direct and Indirect Effects of Project Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction Impacts

Similar to the proposed project, construction-related vehicle traffic could result in increased congestion and delays for vehicles. Alternative 5a would have the ***same impact conclusion*** for construction-related vehicle traffic impacts as the proposed project for the same roads as described in Section 4.9, less than significant with mitigation. For Alternative 5b, except for facilities north of Charles Benson Road (5.5 additional miles of source water pipeline and the slant wells at the Potrero Road parking lot), construction-related traffic would access the work areas using the roads described in Section 4.9 for the proposed project. For the same reasons described above for Alternative 1, Alternative 5b would result in potentially significant impacts from construction-related traffic, lane closures, road hazards, emergency vehicle access, public transportation, road wear, and parking interference. However, with implementation of **Mitigation Measures 4.9-1** (**Traffic Control and Safety Assurance Plan**), **4.9-6** (**Roadway Rehabilitation Program**), **4.9-7** (**Construction Parking Requirements**) Alternative 5b would result an increased level of impact but the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

The operation and maintenance activities for Alternatives 5a and 5b would be the same as those for the proposed project, and the minimal number of daily vehicle trips associated with worker commutes and deliveries would be negligible compared to existing conditions and would not result in a noticeable increase in traffic on adjacent streets. Therefore, Alternatives 5a and 5b would have the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

For the same reasons discussed in Section 4.9, Traffic and Transportation, there is no discussion in the alternatives analysis of the cumulative impact of conflicts with an applicable congestion management plan, changes in air traffic patterns, permanent increases in traffic safety hazards, or conflicts with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities.

The geographic scope for the cumulative traffic impacts analysis for Alternatives 5a and 5b is the same as for the proposed project. Like Alternative 1, based on the assumption that long-term vehicle trips generated by Alternatives 5a and 5b would be similar to those generated by the proposed project, operations and maintenance activities for Alternatives 5a and 5b would have similar impacts on regional and local roadways as the proposed project, and therefore would result in a less than significant cumulative impact.

Alternatives 5a and 5b would have similar contributions to cumulative impacts as described for Alternative 1, and also would be subject to implementation of **Mitigation Measures 4.9-1** (**Traffic Control and Safety Assurance Plan**), **4.9-6** (**Roadway Rehabilitation Program**), **4.9-7** (**Construction Worker Parking Requirements**), and **4.9-C** (**Construction Traffic Coordination Plan**). Similar to the proposed project, even with implementation of mitigation, the incremental contribution of Alternatives 5a and 5b to potential significant and unavoidable cumulative effects would be significant. Therefore, Alternatives 5a and 5b would have the ***same impact conclusion*** as the proposed project for cumulative construction effects related to traffic and transportation, significant and unavoidable.

5.5.10 Air Quality

The evaluation criteria for Air Quality address: construction emissions of criteria air pollutants that could violate air quality standards; construction emissions that could conflict with implementation of the applicable air quality plan; exposure of people to health risks and/or objectionable odors during construction; long-term increase in criteria pollutant emissions during operations; and exposure of people to a substantial increase in pollutants and/or objectionable odors during operations. Construction of all facilities would result in significant emissions of criteria pollutants in the Monterey Bay Unified Air Pollution Control District (MBUAPCD).

5.5.10.1 Setting/Affected Environment

The components of the alternatives that are common to the proposed project are located south of the Nashua Road/Highway 1 intersection and the setting/affected environment for those facilities is described in Section 4.10, Air Quality. The setting with respect to sensitive receptors for the alternatives components north of the Nashua Road/Highway 1 intersection is presented below.

Pipeline Alignments North of Nashua Road/Highway 1 Intersection and South of Moss Landing

The Alternative 1 source water pipeline along Potrero Road, between the slant wells in the parking lot and Highway 1, would be located within 50 feet of approximately 20 residences. The additional length of source water pipeline associated with Alternative 1, as well as the source water pipelines associated with Alternatives 2 and 5b, would pass within 100 feet of several residences along Nashua Road, Molera Road, and Highway 1.

Potrero Road Parking Lot

The closest sensitive receptors to the alternative slant wells site at the Potrero Road parking lot are residences along Laguna Place located approximately 1,000 feet east of the slant wells site.

Moss Landing Area

The closest sensitive receptors to the Open Water Intake Pump Station site along Dolan Road associated with Alternatives 2 and 3 are boat slips at Moss Landing Harbor, located approximately 1,600 feet to the west. The boat slips would also be within 200 feet of construction activity associated with the source water pipeline and desalinated water pipeline for Alternatives 2 and 3, respectively. In addition, the northwestern boundary of the People's Moss Landing Desalination Plant site (Alternative 4) at the Moss Landing Green Commercial Park and the desalinated water pipeline alignment associated with this alternative are approximately 300 feet and 200 feet east of boat slips in the southeastern part of the harbor, respectively.

The closest sensitive receptors to the desalination plant and data center site along Dolan Road under Alternative 3 are two residences, one approximately 300 feet from the southern boundary of the site, and the other approximately 1,500 feet from the eastern boundary of the site. The residence near the southern border of the site would be within 100 feet of construction activities associated with the brine, source water, and desalinated water pipelines under Alternatives 2 and 3.

5.5.10.2 Direct and Indirect Effects of Proposed Project (Slant Wells at CEMEX)

The proposed project extends from Castroville in the north to the city of Carmel in the south (see **Figure 3-2**) and would include construction of a desalination plant on 25 acres along Charles Benson Road northeast of the City of Marina, up to nine new subsurface slant wells at the CEMEX active mining area, two new wells (ASR-5 and ASR-6) at the existing Seaside Groundwater Basin ASR system, the Carmel Valley Pump Station, and about 21 miles of water conveyance pipelines. The direct and indirect impacts of the proposed project are described in detail in Section 4.7.5.

Impact 4.10-1: Generate emissions of criteria air pollutants that could contribute to a violation of an ambient air quality standard during construction.

Impact 4.10-2: Construction activities could conflict with implementation of the applicable air quality plan.

Short-term emissions associated with construction of the proposed project could contribute to an exceedance of a state and/or federal standard for ozone, NO_2, and, PM_{10} based on the estimated maximum daily mass emissions levels presented in **Table 4.10-5**, which would exceed the MBUAPCD significance threshold for PM_{10}. However, this impact with respect to the ozone and NO_2 standards would be significant and unavoidable even with implementation of **Mitigation Measures 4.10-1a** and **4.10-1b**. This significant impact could increase the susceptibility of sensitive individuals to respiratory infections. With respect to the PM_{10} standards, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.10-1a** through **4.10-1d**. Short-term construction emissions associated with other criteria pollutants, including ROG, CO, and $PM_{2.5}$, would not be expected to contribute to an exceedance of an ambient air quality standard and the associated impact for all other criteria pollutants would be less than significant.

The most recently adopted air quality plan for the project area is the 2012 AQMP which documents the MBUAPCD's progress toward attaining the state 8-hour ozone standard. Any project that could conflict with the MBUAPCD's goal of attaining the state 8-hour ozone standard would be considered to conflict with the intent of the 2012 AQMP. The method used for determining whether construction of the project would conflict with the intent of the 2012 AQMP is to compare the project emissions with the CEQA thresholds of significance for the ozone precursors NOx and ROG.

The project-related short-term construction emissions with mitigation measures incorporated would exceed the significance threshold for NOX (see Impact 4.10-1); therefore, the project would not support the primary goal of the 2012 AQMP, and the impact associated with conflicting or obstructing implementation of the applicable air quality plan would be significant and unavoidable, even with implementation of mitigation.

Impact 4.10-3: Expose sensitive receptors to substantial pollutant concentrations and/or coccidioides immitis spores or create objectionable odors affecting a substantial number of people during construction.

Short-term generation of diesel particulate matter (DPM) emissions from off-road diesel equipment could result in the temporary exposure of local sensitive receptors to toxic air contaminants (TACs) (i.e., DPM). Cancer risk and health hazard index values associated with the project are less than the significance thresholds established by MBUPACD. Therefore, impacts would be less than significant.

Ground-disturbing construction activities could release *coccidioides immitis* (Valley Fever) spores. Construction activities are similar to those that occur continually within the County and the project would not result in a substantial increase in spore release. Therefore, construction of the project would not represent an increased risk to public health.

Construction activities could result in temporary odors from use of diesel-fueled equipment. These odors would dissipate quickly, and would be unlikely to create objectionable odors that would affect a substantial number of people.

Impact 4.10-4: Long-term increase of criteria pollutant emissions that could contribute to a violation of an ambient air quality standard during operations.

The combined operational emissions associated with the MPWSP Desalination Plant, Monterey Pump Station, Carmel Valley Pump Station, and the slant wells would not exceed any of the MBUAPCD's significance thresholds; therefore, operational emissions would not be expected to result in or contribute to an exceedance of an ambient air quality standard and the associated impact would be considered to be less than significant. No impact would result from operation and maintenance of all other project components.

Impact 4.10-5: Expose sensitive receptors to substantial pollutant concentrations or create objectionable odors affecting a substantial number of people during operations.

The only DPM emissions sources associated with MPWSP operations would be the emergency standby generators at the MPWSP Desalination Plant, Monterey Pump Station, and the Carmel Valley Pump Station. Routine testing and operation of the emergency generators would generate a negligible amount of DPM emissions. The generator emissions would not exceed the MBUAPCD TAC significance threshold for increased health risks. Therefore, the impact would be less than significant for the MPWSP Desalination Plant, Monterey Pump Station, and the Carmel Valley Pump Station.

None of the other project facilities would include on-site DPM emissions sources. Therefore, no impact related to the exposure of sensitive receptors to substantial pollutant concentrations would result from operation of any other MPWSP facility.

Long-term operations associated with the MPWSP would not create objectionable odors that could affect a substantial number of people because the MPWSP Desalination Plant would be designed with odor control features and operational controls to limit and contain odors. Further, the MPWSP Desalination Plant site is located at least 2,000 feet away from the closest residences and in an industrial area with existing sources of objectionable odors. Therefore, operational impacts related to the creation of objectionable odors affecting a substantial number of people would be less than significant.

Impact 4.10-C: Cumulative impacts related to air quality,

The cumulative impact of construction emissions associated with the potential to contribute to a violation of an ambient air quality standard and conflict with implementation of the applicable air quality plan and would be significant when combined with the emissions associated with the cumulative projects in **Table 4.1-2**. The cumulative impact with respect to the ozone and NO_2 standards would be significant and unavoidable, even with implementation of **Mitigation Measure 4.10-1a** and **4.10-1b**. Therefore, the MPWSP's incremental contribution to this cumulative impact would be significant. However, with respect to the PM_{10} standards, the cumulative impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.10-1a** through **4.10-1d**.

5.5.10.3 Direct and Indirect Effects of No Project Alternative

Under the No Project Alternative, no new facilities would be constructed or operated. Consequently, there would be no construction- or operations-related air quality emissions associated with the No Project Alternative. However, decommissioning of the test slant well could result in potentially significant but mitigable short-term impacts on air quality, including the potential to violate ambient air quality standards associated with ozone, NO_x, and, PM_{10}. See Table 4.10-5, Estimated Maximum Daily Construction Emissions, which includes the estimated emissions for construction of the slant wells. Slant well decommissioning would produce a fraction of the emissions associated with the slant well construction period since decommissioning would not involve drilling and would take 4 weeks rather than 15 or more months; construction emissions would only occur as a result of grading, excavation, and earth moving activities. Impacts would be less than significant with mitigation. Mitigation Measures 4.10-1a through 4.10-1c would apply to slant well decommissioning. Because the No Project Alternative would have a less than significant impact with respect to air quality emissions after mitigation, cumulative effects related to these topics would also be less than significant.

5.5.10.4 Direct and Indirect Effects of Alternative 1 – Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.4.3). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**).

Construction Impacts

Potential to Violate an Air Quality Standard and Conflict with an Air Quality Plan

The 5.5 miles of additional source water pipeline, and the one additional well required for Alternative 1 (10 new wells at Potrero Road versus 9 new wells plus the converted test well at CEMEX) would result in an overall increase in the generation of short-term criteria pollutant emissions. Although Alternative 1 would increase the duration of pipeline construction activities compared to the proposed project, the daily construction activities associated with Alternative 1 would be same as the proposed project. Therefore, short-term emissions associated with construction of Alternative 1 could contribute to an exceedance of a state and/or federal ambient air quality standard for ozone, NO_2, and PM_{10}. This impact with respect to the ozone and NO_x standards would be significant and unavoidable even with implementation of **Mitigation Measures 4.10-1a** and **4.10-1b**. With respect to the PM_{10} standards, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.10-1a** through **4.10-1d**. The overall increase in construction emissions under Alternative 1 compared to the proposed project would increase the potential for this alternative to result in a violation of an air quality standard and conflict with the 2012 Air Quality Management Plan. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, significant and unavoidable, even with mitigation.

Impacts on Sensitive Receptors

Construction of Alternative 1 would result in the short-term generation of diesel particulate matter (DPM) emissions from the use of off-road diesel equipment. These emissions could result in the short-term exposure of local sensitive receptors to toxic air contaminants (TACs) (i.e., DPM). Under Alternative 1, the slant well site would be about half the distance to residences compared to the proposed project and the alternative source water pipeline from the Potrero Road parking lot south to Charles Benson Road would be constructed in close proximately to dozens more residences compared to the proposed project Source Water Pipeline. More sensitive receptors would be exposed to DPM and dust emissions that could contain *coccidioides immitis* (Valley Fever) spores under this alternative compared to the proposed project. Construction could result in temporary odors from use of diesel-fueled equipment, which would dissipate quickly and be unlikely to create objectionable odors that would affect a substantial number of people. Although Alternative 1 would have an increase in the number of nearby sensitive receptors compared to the proposed project, given the distance of the alternative slant wells site to the nearest sensitive receptors (i.e., 1,000 feet) and the limited duration of exposure for any given sensitive receptor associated with pipeline construction, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Operational and Facility Siting Impacts

Alternative 1 would have the ***same impact conclusion*** related to long-term operational emissions and objectionable odors on sensitive receptors as the proposed project, less than significant.

Cumulative Analysis

The geographic scope of analysis for potential cumulative air quality impacts related to Alternative 1 is the North Central Coast Air Basin, same as for the proposed project. As indicated in Section 4.10.6, the air basin does not attain the state ambient air quality standards for ozone or PM_{10}; however, it attains (or is unclassified for) all federal standards. Therefore, conditions in the air basin reflect the contributions of past and ongoing projects that have resulted in an existing significant cumulative impact with respect to attainment of state standards for ozone and PM_{10} concentrations.

As discussed above, with respect to the PM_{10} standards, the impact of Alternative 1 would be significant, but would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.10-1a** through **4.10-1d**. Therefore, for the reasons described for the proposed project in Section 4.10.6, Alternative 1 would result in a significant contribution to the existing significant cumulative impact related to PM_{10}, but with mitigation, the contribution would be reduced to less than significant.

As discussed above, construction emissions associated with Alternative 1 would exceed the MBUAPCD significance thresholds and therefore could have a significant contribution to an exceedance of a state and/or federal standard for ozone or NO_2 even with mitigation. Therefore, the incremental impact of Alternative 1 associated with the potential to contribute to a violation of an ambient air quality standard and conflict with implementation of the applicable air quality plan would be significant when combined with the emissions associated with the cumulative projects identified in **Table 4.1-2** in Section 4.1, and the incremental contribution to significant cumulative impacts related to ozone and NO_2 would be cumulatively significant and unavoidable, similar to but more severe than the proposed project.

Operations of Alternative 1 would not cause emissions that would exceed the MBUAPCD significance thresholds. Therefore, Alternative 1 would result in a less than significant cumulative impact related to emissions of criteria pollutants.

Alternative 1 would not result in short-term or long-term significant impacts from the exposure of sensitive receptors to TAC emissions, *coccidioides immitis* spores, or objectionable odors and there are no cumulative projects in the vicinity of the Potrero Road slant well site that would emit TACs, dust emissions that could contain *coccidioides immitis* spores, or objectionable odors with which the emissions of that component of Alternative 1 could combine. As a result, no significant cumulative impact would occur as a result of Alternative 1 and the identified projects relative to exposure of sensitive receptors to TAC emissions, *coccidioides immitis* spores, or objectionable odors.

Overall, Alternative 1 would result in the ***same impact conclusion*** as the proposed project for cumulative impacts related to air quality (NO_2), significant and unavoidable.

5.5.10.5 Direct and Indirect Effects of Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a new, screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station on Dolan Road (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**). Therefore, the impact analysis of Alternative 2 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 2.

Construction Impacts

Potential to Violate an Air Quality Standard and Conflict with an Air Quality Plan

The construction of a new screened open water intake system in Monterey Bay that would require the use of marine vessel(s) and/or barge(s), and land-based Horizontal Directional Drilling (HDD) equipment for installation of a 36-inch-diameter 3,600-foot-long pipeline from the Intake Pump Station on Dolan Road to the intake location on the seafloor within MBNMS. Total emissions from these activities would likely be similar to those that would occur for the construction of the nine new slant wells for the proposed project. The additional 6.5-mile length of the alternative source water pipeline would result in a net increase in pipeline construction even though Alternative 2 would not include construction of the proposed 4.5-mile-long Castroville Pipeline or the proposed 1.2-mile-long Pipeline to the CSIP Pond. The net increase in pipeline construction would occur even though the net pipeline length under the alternative would be reduced compared to the proposed project because the diameter of the Source Water Pipeline would be much larger (i.e., 42 inches) than the Castroville Pipeline or the Pipeline to the CSIP (12-inch diameters).

Alternative 2 would result in an overall increase in construction emissions compared to the proposed project from the increase in duration of pipeline construction activities compared to the proposed project. However, the daily construction activities associated with Alternative 2 would be the same as the proposed project. Short-term emissions associated with construction of Alternative 2 could contribute to an exceedance of a state and/or federal standard for ozone, NO_2, and/or PM_{10}. This impact with respect to the ozone and NO_2 standards would be significant and unavoidable even with implementation of **Mitigation Measures 4.10-1a** and **4.10-1b**. With respect to PM_{10} standards, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.10-1a** through **4.10-1d**. Construction emissions under

Alternative 2 would be increased compared to the proposed project due to the longer construction period and thus more days of exceedances, increasing the potential for this alternative to result in a violation of an air quality standard and conflict with the 2012 Air Quality Management Plan. However, Alternative 2 would result in the ***same impact conclusion*** as the proposed project, significant and unavoidable, even with mitigation.

Impacts on Sensitive Receptors

Construction of Alternative 2 would result in the short-term generation of DPM emissions from the use of off-road diesel equipment. These emissions could result in the short-term exposure of local sensitive receptors to TACs. Under Alternative 2, the intake pump station site would be constructed approximately 1,600 feet from the nearest sensitive receptors, which would be closer to sensitive receptors compared to the proposed slant wells site. In addition, the Alternative 2 source water pipeline would be constructed in close proximately to several more residences compared to the proposed project Source Water Pipeline. More sensitive receptors would be exposed to DPM and dust emissions that could contain *coccidioides immitis* spores under this alternative compared to the proposed project. Construction could result in temporary odors from use of diesel-fueled equipment, which would dissipate quickly and be unlikely to create objectionable odors that would affect a substantial number of people. However, given the distance of the Intake Pump Station site to the nearest sensitive receptors and the limited duration of exposure for any given sensitive receptor associated with pipeline construction, Alternative 2 would result in the ***same impact conclusion*** as the proposed project however, less than significant.

Operational and Facility Siting Impacts

Because the source water from the open water intake system would not have the benefit of being filtered through the seafloor, and would require an increased level of pre-treatment at the desalination plant, there would be an increase in the amount of annual emissions and objectionable odors compared to the proposed project. However, in terms of maximum daily emissions, the criterion which significance is based on, long-term operational emissions under Alternative 2 would result in the ***same impact conclusion*** related to sensitive receptors as the proposed project, less than significant.

Cumulative Analysis

The geographic scope of analysis for potential cumulative air quality impacts related to Alternative 2 is the North Central Coast Air Basin, same as for the proposed project. As indicated in Section 4.10.6, the air basin does not attain the state standards for ozone or PM_{10}; however, it attains (or is unclassified for) all federal standards. Therefore, conditions in the air basin reflect the contributions of past and ongoing projects that have resulted in an existing significant cumulative impact with respect to attainment of state standards for ozone and PM_{10} concentrations.

As discussed above, with respect to the PM_{10} standards, the impact of Alternative 2 would be significant, but would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.10-1a** through **4.10-1d**. Therefore, for the reasons described for the proposed project in Section 4.10.6, Alternative 2 would result in a cumulatively significant contribution to the existing significant cumulative impacts related to PM_{10}, but with mitigation, the contribution would be reduced to less than significant.

As discussed above, construction emissions associated with Alternative 2 would exceed the MBUAPCD significance thresholds and therefore could contribute to an exceedance of a state and/or federal standard for ozone or NO_2 even with mitigation. Therefore, the incremental impact of Alternative 2 associated with the potential to contribute to a violation of an ambient air quality standard and conflict with implementation of the applicable air quality plan would be significant when combined with the emissions associated with the cumulative projects identified in **Table 4.1-2**, and the incremental contribution to existing significant cumulative impacts related to ozone and NO_2 would be cumulatively significant and the overall cumulative impact would be significant and unavoidable.

Operations of Alternative 2 would not cause emissions that would exceed the MBUAPCD significance thresholds. Therefore, Alternative 2's contribution to cumulative impacts related to criteria pollutant emissions would be less than significant.

Alternative 2 would not result in short-term or long-term significant impacts from the exposure of sensitive receptors to TAC emissions, dust emissions that contain *coccidioides immitis* spores, or objectionable odors. There is one project in the cumulative scenario described in **Table 4.1-2** and Section 4.1 – the DeepWater Desal Project – that could result in significant impacts on sensitive receptors in the vicinity of the open water intake and pump station; however, given the distance of the Alternative 2 Open Ocean Intake Pump Station site to the nearest sensitive receptors and the limited duration of exposure for any given sensitive receptor associated with Alternative 2 pipeline construction, these components of Alternative 2 would have a less than significant contribution to cumulative impacts.

Overall, Alternative 2 would result in the ***same impact conclusion*** as the proposed project for cumulative impacts related to air quality (NO_2), significant and unavoidable.

5.5.10.6 Direct and Indirect Effects of Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The pipelines for the intake and discharge systems would be installed using HDD. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-3**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley

Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**). Therefore, the impact analysis of Alternative 3 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 3.

Construction Impacts

Potential to Violate an Air Quality Standard and Conflict with an Air Quality Plan

The construction of a new screened open water intake and discharge system in Monterey Bay that would require the use of marine vessel(s) and/or barge(s), and land-based HDD equipment for the installation of four 42-inch diameter pipelines from the pump station on Dolan Road to the intake and discharge structures on the seafloor in MBNMS, and four 1.1-mile pipelines from the pump station to the desalination/data center site, resulting in 2.5 additional miles of pipeline compared to the proposed project Source Water Pipeline. In addition, the construction of a large data center and cooling system, and 31.5 miles of additional Desalinated Water Pipeline (25 of which would for delivery of water to potential customers in Santa Cruz County, Salinas, or both) would result in a net increase in total construction emissions compared to the proposed project.

Because Alternative 3 would result in greater construction-related emissions of criteria pollutants than the proposed project, short-term emissions associated with construction of Alternative 3 could contribute to an exceedance of a state and/or federal standard for ozone, NO_2, and/or PM_{10}. With respect to the ozone and NO_2 standards, Alternative 3 would result in the same impact conclusion as the proposed project, and would be significant and unavoidable even with implementation of **Mitigation Measures 4.10-1a** and **4.10-1b**.

The desalination facility, the data center, and the cooling system would result in an increased amount of ground disturbance during construction (i.e., 60 acres compared to 25 acres associated with the proposed MPWSP plant site). It is not currently known how construction of these facilities would proceed; however, if the data center and/or cooling system were constructed concurrently with the desalination facility, the combined daily emissions would exceed the MBUAPCD threshold for PM_{10} emissions, resulting in an increased level of impact compared to the proposed project, significant and unavoidable impact even with implementation of **Mitigation Measures 4.10-1a** through **4.10-1d**. Overall, construction emissions would increase the potential for this alternative to result in a violation of an air quality standard and conflict with the 2012 Air Quality Management Plan; therefore Alternative 3 would result in the ***same impact conclusion*** as the proposed project, significant and unavoidable, even with mitigation.

Impacts on Sensitive Receptors

Alternative 3 would result in the short-term generation of DPM emissions from the use of off-road diesel equipment that could result in the short-term exposure of local sensitive receptors to

TACs (i.e., DPM). Under Alternative 3, construction of the 60-acre desalination plant and data center would occur within 300 feet of a residence on Dolan Road, and this residence would also be within 100 feet of construction of the brine, source water, and desalinated water pipelines. This residence would be exposed to substantially higher concentrations of DPM, dust emissions that could contain *coccidioides immitis* spores, and objectionable odors from the use of diesel-fueled equipment compared to the exposure of the closest residence to the proposed MPWSP desalination plant site. Given the close proximity to the residence and the substantial amount of construction activities that would occur at the 60-acre site over a 24-month period, this impact would likely be significant and unavoidable due to elevated emissions exposure even with implementation of **Mitigation Measures 4.10-1a** and **4.101b**, which would require the applicant and/or its construction contractor to make a good faith effort to use available construction equipment that meets the highest USEPA-certified tiered emission standards and limit equipment and vehicle idling, respectively. Therefore, Alternative 3 would result in an ***increased impact conclusion*** compared to the proposed project, significant and unavoidable, even with mitigation.

Operational and Facility Siting Impacts

Alternative 3 would include the operation of three natural gas emergency generators that would have a total combined capacity of up to 30 MW of generation, substantially more than the 0.7 MW of emergency generation for the proposed MPWSP desalination plant site. Based on information available about Alternative 3, the proponent expects to operate each generator for up to 1,500 hours per year; however, the MBUAPCD limits operation of standby natural gas engines to no more than 60 hours per year for testing/exercising purposes (MBUAPCD, 2013). Assuming that each of the three generators would be tested for 5 hours once a month on different days and that each of the generators would be subject to MBUAPCD Best Available Control Technology (BACT) requirements for stand-by generators, maximum-day NO_x emissions would be approximately 219 pounds per day, which would exceed the MBUAPCD's significance threshold of 137 pounds per day (refer to Emergency Generator Emissions in **Appendix G1** for details on the emission calculation). This would be a significant impact that would occur three times a month and 36 times a year. However, it is assumed that implementation of a mitigation measuresimilar to **Mitigation Measure ALT 3-AQ**, below, which would restrict test/exercise operations of the emergency generators to no more than three hours per day, would be required for this alternative to reduce this significant impact to a less-than-significant level.

Although the health risk that would be associated with operating the emergency generators under Alternative 3 may be elevated compared to the proposed project, the associated impact would not be significant if the generators were sited on the north side of the property away from the residence. Further, combustion of natural gas does not result in high concentrations of TACs and no DPM would be generated, therefore objectionable odors would also be minimized. To ensure that the operational health risk impact would be reduced to a less-than-significant level, implementation of **Mitigation Measure ALT 3-AQ** would be required. Therefore, Alternative 3 would result in an ***increased impact conclusion*** compared to the proposed project during operations, less than significant with mitigation.

Mitigation Measure ALT 3-AQ applies to the emergency backup generators associated with the Alternative 3 data center and cooling system and would not apply to the proposed project or other alternatives.

Mitigation Measure ALT 3-AQ: Restrict Daily Testing and Locations of Emergency Generators.

Each of the three 10 MW natural gas emergency generators associated with Alternative 3 shall be restricted to no more than three hours of testing/exercising per day. Only one emergency generator shall be tested per day. The emergency generators shall be located at the site as far as practicable from the nearest residences.

Cumulative Analysis

The geographic scope of analysis for potential cumulative air quality impacts related to Alternative 3 is the North Central Coast Air Basin, same as for the proposed project. As indicated in Section 4.10.6, the air basin does not attain the state standards for ozone or PM_{10}; however, it attains (or is unclassified for) all federal standards. Therefore, conditions in the air basin reflect the contributions of past and ongoing projects that have resulted in an existing significant cumulative impact with respect to attainment of state standards for ozone and PM_{10} concentrations.

As discussed above, construction emissions associated with Alternative 3 would exceed the MBUAPCD significance thresholds and therefore could contribute to an exceedance of a state and/or federal ambient air quality standard for ozone, NO_2, and PM_{10} even with mitigation. Therefore, the cumulative impact of Alternative 3 associated with the potential to contribute to a violation of an ambient air quality standard and conflict with implementation of the applicable air quality plan would be significant and unavoidable when combined with the emissions associated with the cumulative projects identified in **Table 4.1-2** in Section 4.1, and the incremental contribution to the cumulative impact would be significant and the significant and unavoidable impact would be substantially greater than for the proposed project.

Operations of Alternative 3 could cause emissions that would exceed the MBUAPCD significance thresholds. However, implementation of **Mitigation Measure ALT 3-AQ** would reduce the operational emissions to a less-than-significant level. Therefore, Alternative 3's contribution to cumulative criteria pollutants emissions impacts would be significant; however, the incremental contribution would be reduced to a level that is less than significant with implementation of mitigation.

With regard to exposure of sensitive receptors to TAC emissions, *coccidioides immitis* spores, or objectionable diesel fuel-related odors, Alternative 3 could result in a short-term impact that would be significant even with mitigation.

Overall, Alternative 3 would have the ***same impact conclusion*** as the proposed project for cumulative impacts related to air quality, significant and unavoidable.

5.5.10.7 Direct and Indirect Effects of Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**). Therefore, the impact analysis of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4.

Construction Impacts

Potential to Violate an Air Quality Standard and Conflict with an Air Quality Plan

The construction of a new screened open water intake and discharge system in Monterey Bay would require the use of marine vessel(s) and/or barge(s), and land-based HDD equipment for installation of a portion of the pipelines from the existing caisson to the intake and discharge on the seafloor in MBNMS. Emissions from these sources may be less than those that would be required to construct the nine proposed slant wells that would each be up to 1,000 feet in length. However, this alternative would have a longer desalinated water pipeline (6.5 miles longer), resulting in a net increase in pipeline construction and associated emissions even though it would not include construction of the proposed 4.5-mile-long Castroville Pipeline or the proposed 1.2-mile-long Pipeline to CSIP Pond. Overall, the net emissions associated with Alternative 4 would be similar to those that would occur under the proposed project. Short-term emissions associated with construction of Alternative 4 could contribute to an exceedance of a state and/or federal standard for ozone, NO_2, and/or, PM_{10}. This impact with respect to the ozone and NO_2 standards would be significant and unavoidable even with implementation of **Mitigation Measures 4.10-1a** and **4.10-1b**. With respect to the PM_{10} standards, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.10-1a** through **4.10-1d**. The potential for Alternative 4 to result in a violation of an air quality standard and conflict with the 2012 Air Quality Management Plan would be significant and unavoidable, even with mitigation. Therefore, Alternative 4 would result in the ***same impact conclusion*** as the proposed project, significant and unavoidable, even with mitigation.

Impacts on Sensitive Receptors

Construction would result in the short-term generation of DPM emissions from the use of off-road diesel equipment that could result in the short-term exposure of local sensitive receptors to

TACs (i.e., DPM). Under Alternative 4, construction of the desalination plant would occur within 200 feet of boat slips at Moss Landing Harbor where people could reside, and receptors would also be within 200 feet of construction activities that would be associated with the longer desalinated water pipeline. These sensitive receptors would be exposed to substantially higher concentrations of DPM, dust emissions that could contain *coccidioides immitis* spores, and objectionable odors from the use of diesel-fueled equipment compared to the closest sensitive receptors to the proposed MPWSP plant site. Given this alternative site's close proximity to sensitive receptors and the amount of construction activities that would occur at the project site over the construction period, this impact would be significant and unavoidable even with implementation of **Mitigation Measures 4.10-1a** and **4.10-1b**, which would require the applicant and/or its construction contractor to make a good faith effort to use available construction equipment that meets the highest USEPA-certified tiered emission standards and limit equipment and vehicle idling, respectively. Therefore, Alternative 4 would have result in an ***increased impact conclusion*** on sensitive receptors compared to the proposed project, significant and unavoidable, even with mitigation.

Operational and Facility Siting Impacts

Because the source water from the open water intake system would not have the benefit of being filtered through the seafloor, and would require an increased level of pre-treatment at the desalination plant, there would be an increase in the amount of annual emissions compared to the proposed project. However, in terms of maximum daily emissions, the criterion which significance is based on, long-term operational emissions under Alternative 4 would result in the ***same impact conclusion*** related to sensitive receptors as the proposed project, less than significant.

Cumulative Analysis

The geographic scope of analysis for potential cumulative air quality impacts related to Alternative 4 is the North Central Coast Air Basin, same as for the proposed project. As indicated in Section 4.10.6, the air basin does not attain the state standards for ozone or PM_{10}; however, it attains (or is unclassified for) all federal standards. Therefore, conditions in the air basin reflect the contributions of past and ongoing projects that have resulted in an existing significant cumulative impact with respect to attainment of state standards for ozone and PM_{10} concentrations.

As discussed above, with respect to the PM_{10} standards, the impact of Alternative 4 would be significant, but would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.10-1a** through **4.10-1d**. Therefore, for the reasons described for the proposed project in Section 4.10.6, Alternative 4 would have a significant contribution to existing significant cumulative impacts related to PM_{10}, but that contribution would be reduced by mitigation to a less than significant impact.

As discussed above, construction emissions associated with Alternative 4 would exceed the MBUAPCD significance thresholds and therefore could contribute to an exceedance of a state and/or federal standard for ozone or NO_2 even with mitigation. Therefore, the cumulative impact of Alternative 4 associated with the potential to contribute to a violation of an ambient air quality standard and conflict with implementation of the applicable air quality plan would be significant when combined with the emissions associated with the cumulative projects identified in **Table 4.1-2** in Section 4.1, and the incremental contribution to the cumulative impact would be significant and unavoidable.

Operations of Alternative 4 would not cause emissions that would exceed the MBUAPCD significance thresholds. Therefore, Alternative 4 would have a less than significant contribution to a cumulative impact related to emissions of criteria pollutants.

With regard to exposure of sensitive receptors to TAC emissions, *coccidioides immitis* spores, and objectionable odors from diesel-fueled equipment, Alternative 4 could result in a short-term impact that would be significant even with mitigation. As a result, the cumulative health risk impact of Alternative 4 would also be significant and unavoidable, as would the incremental contribution of Alternative 4.

Overall, Alternative 4 would result in the ***same impact conclusion*** as the proposed project for cumulative impacts related to air quality, significant and unavoidable.

5.5.10.8 Direct and Indirect Effects of Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction Impacts

Potential to Violate an Air Quality Standard and Conflict with an Air Quality Plan

Because the construction of Alternative 5a components would be located in the same location and would have a slightly reduced footprint because of the reduced number of wells compared to the proposed project, Alternative 5a would result in a similar level of impact compared to the proposed project. Likewise, construction of Alternative 5b would result in nearly the same footprint as Alternative 1, and would result in a similar level of impact compared to Alternative 1 and the proposed project. Similar to the proposed project, impacts related to ozone and NO_2 standards would be significant and unavoidable even with implementation of **Mitigation Measures 4.10-1a** and **4.10-1b**. With respect to the PM_{10} standards, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.10-1a** through **4.10-1d**. The potential for this alternative to result in a violation of an air quality standard and conflict with the 2012 Air Quality Management Plan would be the same as the propose project. Therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project, significant and unavoidable, even with mitigation.

Impacts on Sensitive Receptors

Similar to the proposed project, short-term generation of DPM emissions from the use of off-road diesel equipment could result in the short-term exposure of local sensitive receptors to TACs (i.e., DPM). Construction could result in temporary odors from use of diesel-fueled equipment, which would dissipate quickly and be unlikely to create objectionable odors that would affect a substantial number of people. Under Alternative 5a and 5b, construction would result in the same less-than-significant health risk-related impacts as identified for the proposed project and under Alternative 1. Therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project, less than significant.

Operational and Facility Siting Impacts

Alternative 5a and 5b would result in long-term operational and maintenance emissions and objectionable odors that would be less than significant and would be less than those that would be generated under the proposed project because there would be three fewer slant wells to maintain and the horsepower rating of the emergency generator at the desalination plant would be reduced. Therefore, Alternatives 5a and 5b would have result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

Combined Impacts with GWR Project

Because Alternative 5 alone would not fully meet the project objectives and must be paired with the approved GWR Project in order to do so, for informational purposes, this analysis provides the “subtotal” of the Alternative 5 impacts in combination with the impacts of the GWR Project, even though MBUAPCD project-level thresholds are intended to be applied to projects separately, rather than applied to a combination of projects in a cumulative sense. Although both Alternative 5 and the GWR Project were found to have less-than-significant impacts related to daily PM_{10} emissions after mitigation when viewed individually, if Alternative 5 and the GWR Project are under construction concurrently, the post-mitigation daily PM_{10} emissions of Alternative 5 (i.e., 68 pounds) in combination with the mitigated daily PM_{10} emissions of the GWR Project (i.e., 64 pounds; MRWPCA, 2016) would exceed the MBUAPCD significance threshold of 82 pounds per day, resulting in a significant combined impact that could not be further reduced by mitigation and thus would remain significant and unavoidable. The already significant and unavoidable impact with respect to the ozone and NO_2 standards would be worsened in combination with construction emissions of the GWR Project. The GWR Project could expose several of the same sensitive receptors to emissions of TACs or dust that may contain *coccidioides immitis* spores along the new Desalinated Water Pipeline and new Transmission Main alignments. However, due to the nature of pipeline construction, exposures at these locations would be limited in duration and would not result in a significant impact even if construction occurred concurrently. The operational emissions of Alternative 5 would be well below MBUAPCD thresholds, and the addition of GWR Project operational emissions would not result in an exceedance of these thresholds; therefore, in combination, these projects would not result in a significant air quality impact during operation. Overall, Alternative 5 considered in combination with the GWR Project would result in the ***same impact conclusion*** as the proposed project for cumulative impacts related to air quality, significant and unavoidable.

Impacts of Full Cumulative Scenario

The geographic scope of analysis for potential cumulative air quality impacts related to Alternative 5 is the North Central Coast Air Basin, same as for the proposed project. As indicated in Section 4.10.6, the air basin does not attain the state standards for ozone or PM_{10}; however, it attains (or is unclassified for) all federal standards. Therefore, conditions in the air basin reflect the contributions of past and ongoing projects that have resulted in an existing significant cumulative impact with respect to attainment of state standards for ozone and PM_{10} concentrations.

As discussed above, with respect to the PM_{10} standards, the impact of Alternative 5 would be significant, but would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.10-1a** through **4.10-1d**. Therefore, for the reasons described for the proposed project in Section 4.10.6, Alternative 5 would result in a significant contribution to the existing significant cumulative impacts related to PM_{10}, but with mitigation the contribution would be reduced to less than significant.

As discussed above, construction emissions associated with Alternative 5 would exceed the MBUAPCD significance thresholds and therefore could have a significant contribution to an exceedance of a state and/or federal standard for ozone or NO_2 even with mitigation. Therefore, the cumulative impact of Alternative 5 associated with the potential to contribute to a violation of an ambient air quality standard and conflict with implementation of the applicable air quality plan would be significant when combined with the emissions associated with the cumulative projects identified in **Table 4.1-2** in Section 4.1, and the incremental contribution to the significant cumulative impact related to ozone and NO_2 would be significant and unavoidable.

Operations of Alternative 5 would not cause emissions that would exceed the MBUAPCD significance thresholds. Therefore, Alternative 5 would have a less than significant incremental contribution to a significant cumulative impact related to emissions of criteria pollutants.

With regard to exposure of sensitive receptors to TAC emissions, *coccidioides immitis* spores, or objectionable odors, Alternative 5 would not result in short-term or long-term significant impacts associated with exposure of sensitive receptors to TAC emissions when combined with the cumulative projects. For the same reasons described for the proposed project in Section 5.10.6, Alternative 5a would have a less than significant contribution to cumulative impacts related to exposure to TAC emissions, *coccidioides immitis* spores, or objectionable odors. There are no cumulative projects in the vicinity of the Potrero Road slant well site that would emit TACs or dust emissions that could contain *coccidioides immitis* spores with which the emissions of that component of Alternative 5b could combine. As a result, the cumulative impact on sensitive receptors as a result of Alternative 5 would be less than significant.

Overall, Alternative 5 would result in the ***same impact conclusion*** as the proposed project for cumulative impacts related to air quality, significant and unavoidable.

5.5.10.9 References

Monterey Bay Unified Air Pollution Control District (MBUAPCD), 2013. Basic Requirements for Natural Gas/Propane (LPG) Electric Generators & Water Pumps, Revised June 12, 2013.

Monterey Regional Water Pollution Control Agency (MRWPCA), 2016. Consolidated Final EIR for the Pure Water Monterey GWR Project, Section 4.3, Air Quality and Greenhouse Gas. http://purewatermonterey.org/wp/wp-content/uploads/Volume-I-Consolidated-Final-EIR-Jan-2016.pdf

5.5.11 Greenhouse Gas Emissions

The evaluation criteria for greenhouse gas (GHG) emissions address: contribution to climate change from GHG emissions; conflict with Executive Order B-30-15 Emissions Reduction Goal; and conflict with AB 32 Climate Change Scoping Plan.

5.5.11.1 Setting/Affected Environment

The setting/affected environment related to GHG emissions for the alternatives is the same as described for the MPWSP in Section 4.11, Greenhouse Gas Emissions.

5.5.11.2 Direct and Indirect Effects of Proposed Project (Slant Wells at CEMEX)

The proposed project extends from Castroville in the north to the city of Carmel in the south (see **Figure 3-2**) and would include construction of a desalination plant on 25 acres along Charles Benson Road northeast of the City of Marina, up to nine new subsurface slant wells at the CEMEX active mining area, two new wells (ASR-5 and ASR-6) at the existing Seaside Groundwater Basin ASR system, the Carmel Valley Pump Station, and about 21 miles of water conveyance pipelines. The direct and indirect impacts of the proposed project are described in detail in Section 4.7.5.

Impact 4.11-1: Incremental contribution to climate change from GHG emissions associated with the proposed project.

Impact 4.11-2: Conflict with the Executive Order B-30-15 Emissions Reduction Goal.

Impact 4.11-3: Conflict with AB 32 Climate Change Scoping Plan.

Implementation of the MPWSP would result in short-term construction and long-term operational emissions of GHGs. The sum of GHG emissions generated by MPWSP construction amortized over the 40-year project lifetime and the net annual emissions generated by project operation would total approximately 8,365 metric tons CO_2e per year. These emissions would exceed the 2,000 metric tons per year significance threshold; therefore, a significant impact would occur. GHG emissions associated with the proposed project would exceed the emissions significance threshold, which indicates that implementation of the project would not be consistent with the GHG emission reduction goals for year 2030 identified in Executive Order B-30-15. Therefore, it can be concluded that the proposed project would conflict with Executive Order B-30-15 and would result in a potentially significant impact.

The MPWSP Desalination Plant designs include state of the art energy recovery and energy efficient features in place of standard energy saving systems; there may be additional feasible energy reducing features available to further reduce the electrical consumption. CARB has set a 20 percent electricity use reduction target for AB 32 Climate Change Scoping Plan Measure W-3; therefore, a 20 percent reduction in electricity use associated with the proposed project's energy recovery and energy saving features would indicate a less-than-significant impact associated with the proposed project's consistency with this measure.

Implementation of **Mitigation Measure 4.18-1** (**Construction Equipment and Vehicle Efficiency Plan**) would ensure that construction activities are conducted in a fuel-efficient manner and would reduce the overall carbon footprint of the MPWSP. Implementation of **Mitigation Measure 4.11-1** (**GHG Emissions Reduction Plan**) is required to reduce the carbon footprint of electricity consumption for the proposed project to zero; the electricity would be generated from renewable energy sources, and/or would otherwise be offset through the procurement of Renewable Energy Certificates and/or retirement of Carbon Offsets. Overall project emissions would be less than 2,000 metric tons CO_2e per year. The mitigated amortized project emissions would be approximately 1,480 metric tons CO_2e per year. Therefore, these impacts would be mitigated to less-than-significant levels. (Note this significance determination was revised from significant, unavoidable in the Draft EIR/EIS due to the adoption of a GHG Emissions Reduction Plan).

Impact 4.11-C: Cumulative impacts related to greenhouse gas emissions.

Because GHG emissions have global climate change implications, the evaluation of GHG emissions impacts is inherently a cumulative impact analysis. Implementation of the MPWSP would result in short-term construction and long-term operational emissions of GHGs. With implementation of **Mitigation Measures 4.11-1** and **4.18-1**, the project's incremental contribution to the significant cumulative climate change impacts related to GHG emissions and conflicts with the AB 32 Climate Change Scoping Plan would be less than significant. Therefore, cumulative impacts would be less than significant with mitigation.

5.5.11.3 Direct and Indirect Effects of No Project Alternative

Under the No Project Alternative, no new facilities would be constructed or operated. However, decommissioning of the test slant well could result in potentially significant but mitigable impacts on greenhouse gas (GHG) emissions, including the potential to incrementally contribute to climate change. See Table 4.11-3, Total GHG Emissions from Project Construction, which includes the estimated emissions for construction of the slant wells. Slant well decommissioning would produce a fraction of the emissions associated with the slant well construction period since decommissioning would not involve drilling and would take 4 weeks rather than 15 or more months; construction emissions would only occur as a result of grading, excavation, and earth moving activities. Impacts would be less than significant with implementation of Mitigation Measure 4.18-1, which would apply to slant well decommissioning.

Consequently, the construction- or operations-related direct or indirect adverse effects related to GHG emissions would be less than significant. Because the No Project Alternative would have a less than significant impact with respect to GHG emissions, the cumulative effects related to this topic would be less than significant.

5.5.11.4 Direct and Indirect Effects of Alternative 1 - Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (Potrero Road). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**).

Construction and Operation Impacts

The 5.5 miles of additional source water pipeline, and the one additional well required for Alternative 1 (10 new wells at Potrero Road versus 9 new wells plus the converted test well at CEMEX) would result in an increase in amortized GHG emissions compared to the proposed project. In addition, due to the increased length of the Source Water Pipeline, there would be more than three times the energy demand to pump source water to the MPWSP Desalination Plant compared to the proposed project. Thus, this alternative would result in increased indirect GHG emissions associated with electricity usage. Although Alternative 1 would result in the permanent removal of approximately one less acre of scrub vegetation due to the slant wells' location at an existing paved parking lot, the sum of the 40-year amortized construction GHG emissions and the total net operation emissions that would be associated with Alternative 1 would be higher than the emissions shown in **Table 4.11-5** for the proposed project. The emissions of Alternative 1 would exceed the 2,000 metric tons carbon dioxide-equivalent (CO_2e) per year significance threshold resulting in a significant impact. This impact would be reduced to less than significant with implementation of **Mitigation Measures 4.11-1** and **4.18-1**. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, and impacts would be less than significant with mitigation.

Since mitigated GHG emissions would not exceed the emissions significance threshold, Alternative 1 would not conflict with Executive Order B-30-15. As with the proposed project, the only plan that would be directly applicable to Alternative 1 would be the AB 32 Scoping Plan Measure W-3, Water System Energy Efficiency. CARB has set a 20 percent electricity use reduction target from 2006 levels for this measure. Pursuant to implementation of Mitigation Measure 4.11-1, the electricity that would supply Alternative 1 would be generated from renewable energy sources and/or would otherwise be offset through the procurement of Renewable Energy Certificates and/or retirement of Carbon Offsets. Therefore, this impact is also considered to be less than significant with implementation of mitigation. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, and impacts would be less than significant with mitigation.

Cumulative Analysis

Because GHG emissions have global climate change implications, the evaluation of GHG emissions impacts is inherently a cumulative impact analysis. Thus, all of the projects listed in **Table 4.1-2** in Section 4.1, as well as all other sources of GHG emissions, are relevant to the cumulative impacts discussion, and are not discussed in further detail. Through Executive Orders S-3-05 and B-30-15, as well as AB 32, the State has established goals and policies for reducing its contribution of GHG emissions. Accordingly, these policy documents provide goals against which the significance of individual projects' emissions can be measured. Consistent with the emissions reduction goal for 2030 identified in Executive Order B-30-15, the numeric significance threshold used to evaluate operational emissions plus construction emissions amortized over the project's estimated 40-year lifetime is 2,000 metric tons CO_2e per year. The analysis also considers the alternative's consistency with applicable AB 32 Scoping Plan Measure W-3. Since construction and operations under Alternative 1 would not result in GHG emissions greater than the significance threshold and would not conflict with AB 32 Scoping Plan Measure W-3 with implementation of mitigation, Alternative 1 would not result in a cumulatively considerable contribution to significant cumulative impacts. Thus, Alternative 1 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to greenhouse gas emissions, less than significant with mitigation.

5.5.11.5 Direct and Indirect Effects of Alternative 2 - Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a new, screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station on Dolan Road (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**). Therefore, the impact analysis of Alternative 2 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 2.

Construction and Operation Impacts

Construction of a screened open water intake and system, compared to construction of nine proposed slant wells at CEMEX and a longer source water pipeline from Moss Landing south to Charles Benson Road, would result in a net increase of pipeline length and an associated increase in amortized construction emissions of approximately 50 metric tons per year compared to the proposed project. In addition, due to the increased length of the source water pipeline under Alternative 2 (i.e., 7.7 miles compared to 2.2 miles under the proposed project), there would be nearly four times the energy demand to pump source water to the MPWSP Desalination Plant compared to the proposed project, which would increase the indirect GHG emissions associated with electricity usage.

A recent analysis conducted for the project that compared water quality data from the existing test slant well at the CEMEX site to water quality representative of average open-ocean intake conditions in the vicinity of Monterey Bay found that CO_2 degassing from discharged brine would be about 87 percent less than discharged brine water obtained from subsurface slant wells (**Appendix G2**). Given that Alternative 2 would result in the same amount of discharged brine as the proposed project, but would include an open water intake, CO_2 degassing would be reduced by 640 metric tons CO_2 under Alternative 2 compared to the proposed project. In addition, this alternative would result in approximately 1 less acre of permanent scrub vegetation removal and associated 14 metric tons CO_2 of carbon sequestration compared to the proposed project due to the location of the intake pump station at an existing disturbed area.

The sum of the 40-year amortized construction GHG emissions and the total net operation emissions associated with Alternative 2 would be less than the emissions that would be generated under the proposed project (see **Table 4.11-5**). The emissions of Alternative 2 would exceed the 2,000 metric tons CO_2e per year significance threshold, but the impact would be less than significant with implementation of **Mitigation Measures 4.11-1** and **4.18-1**. Therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Since mitigated GHG emissions associated with Alternative 2 would not exceed the emissions significance threshold, Alternative 2 would not conflict with Executive Order B-30-15. As with the proposed project, the only plan that would be directly applicable to Alternative 2 would be the AB 32 Scoping Plan Measure W-3, Water System Energy Efficiency. Pursuant to implementation of Mitigation Measure 4.11-1, the electricity that would supply Alternative 2 would be generated from renewable energy sources and/or would otherwise be offset through the procurement of Renewable Energy Certificates and/or retirement of Carbon Offsets. Therefore, this impact is also considered to be less than significant with implementation of mitigation. Therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Cumulative Analysis

Construction and operations under Alternative 2 would result in GHG emissions less than the applicable numeric significance threshold and would not conflict with AB 32 Scoping Plan Measure W-3 with implementation of mitigation. Therefore, Alternative 2 would not result in a cumulatively considerable contribution to significant cumulative impacts. Overall, Alternative 2 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to greenhouse gas emissions, less than significant with mitigation.

5.5.11.6 Direct and Indirect Effects of Alternative 3 - Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The pipelines for the intake and discharge systems would be installed using HDD. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-3**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**). Therefore, the impact analysis of Alternative 3 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 3.

Construction and Operation Impacts

Construction of a screened open water intake and brine discharge system would require the use of a marine barge(s), and land-based HDD equipment for the installation of four 42-inch diameter pipelines from the pump station on Dolan Road to the intake and discharge structures on the seafloor in MBNMS, and four 1.1-mile pipelines from the pump station to the desalination/data center site, resulting in 2.5 additional miles of pipeline compared to the proposed project Source Water Pipeline. This alternative would also include construction of a larger desalination plant, data center and cooling system, and up to 25 miles of additional desalinated water pipelines to deliver water (in addition to the 9.6 mgd served to CalAm's Monterey District) to potential customers in Santa Cruz County, Salinas, or both. Therefore, there would be an overall increase in amortized annual construction emissions under Alternative 3 compared to the proposed project.

Operations of the data center and cooling system under Alternative 3 would result in a considerable energy demand increase compared to the proposed project. The data center would require 150 megawatts (MW) of electrical power to operate. Compared to the proposed project, which would result in a net power consumption increase of less than 6 MW, Alternative 3 would substantially increase indirect GHG emissions associated with electricity usage. This energy demand would be more than 25 times the net energy demand increase that would occur under the proposed project. This would result in an additional 171,000 metric tons CO_2e per year beyond the indirect emissions that would occur as a result of only the desalination facility. With regard to CO_2 degassing from discharged water, given that Alternative 3 would result in approximately twice the amount of discharged brine as the proposed project, but would include an open-ocean intake, CO_2 degassing would be reduced by 545 metric tons CO_2 under Alternative 3 compared to the proposed project. With regard to the loss of vegetation-related carbon sequestration, Alternative 3 would result in the loss of up to 91 acres of grassland at the desalination facility, data center, and electrical substation location compared to 15 acres of grassland under the proposed project. This would increase the loss of sequestration potential by more than 313 metric tons CO_2 per year. See **Appendix G1** for emissions estimates.

The sum of the 40-year amortized construction GHG emissions and the total net operation emissions associated with Alternative 3 would be substantially higher than the emissions presented in **Table 4.11-5** for the proposed project. Although Alternative 3 does not include GHG reduction measures, the DeepWater Desal Project proponent indicates that energy minimization and other GHG reduction measures to make the DeepWater Desal Project net-carbon neutral are being considered (DeepWater Desal, 2016). The separate EIR/EIS for the DeepWater Desal Project will evaluate any such project features if they are identified, but they are not included as part of Alternative 3 in this EIR/EIS. The emissions of Alternative 3 would exceed the 2,000 metric tons CO_2e per year significance threshold. Due to the large scale of Alternative 3, it is not certain that implementation of measures similar to **Mitigation Measures 4.11-1** and **4.18-1** would be feasible to the extent that they would be able to reduce the impact to a less-than-significant level. Therefore, Alternative 3 would result in an ***increased impact conclusion*** compared to the proposed project; it would be significant and unavoidable, even with mitigation.

Since GHG emissions associated with Alternative 3 would exceed the emissions significance threshold, Alternative 3 would conflict with Executive Order B-30-15 and would result in a significant impact even with implementation of mitigation. As with the proposed project, the only plan that would be directly applicable to Alternative 3 would be the AB 32 Scoping Plan Measure W-3, Water System Energy Efficiency. The lead agencies cannot substantiate that GHG emissions under Alternative 3 would be reduced to a less-than-significant level. Therefore, Alternative 3 would result in an ***increased impact conclusion*** compared to the proposed project; it would be significant and unavoidable, even with mitigation.

Cumulative Analysis

Construction and operations under Alternative 3 would result in GHG emissions greater than the applicable numeric significance threshold and would conflict with AB 32 Scoping Plan Measure W-3. Therefore, Alternative 3 would result in a cumulatively considerable contribution to significant cumulative impacts, of a higher magnitude than the proposed project. Overall, Alternative 3 would result in an ***increased impact conclusion*** compared to the proposed project for cumulative effects related to greenhouse gas emissions; it would be significant and unavoidable, even with mitigation.

5.5.11.7 Direct and Indirect Effects of Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**). Therefore, the impact analysis of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4.

Construction and Operation Impacts

Construction of a screened open water intake and brine discharge system would require the use of marine vessel(s) and land-based HDD equipment for installation of a portion of the pipelines from the existing caisson to the intake and discharge on the seafloor in MBNMS. Therefore, there would be an overall increase in amortized construction emissions under Alternative 4 compared to the proposed project.

Long-term operations of the People's Project would produce approximately 25 percent more product water than the proposed project. This increase in product water would result in an approximately 25 percent increase in energy demand, that would increase the net indirect emissions from electricity usage under Alternative 4 by 1,715 metric tons CO_2e per year compared to the proposed project. With regard to CO_2 degassing from discharged water, given that Alternative 4 would result in approximately 32 percent more discharged brine compared to the proposed project, but would include an open water intake, CO_2 degassing would be reduced by 610 metric tons compared to the proposed project. In addition, this alternative would result in approximately one less acre of permanent scrub vegetation removal and 15 less acres of permanent grassland removal compared to the proposed project due to the location of its intake pump station and desalination plant at existing disturbed areas. This would result in approximately 79 metric tons CO_2e per year additionally sequestered compared to the proposed project. See **Appendix G1** for emissions estimates.

The sum of the 40-year amortized construction GHG emissions and the total net operation emissions associated with Alternative 4 would be higher compared to the proposed project. The emissions of Alternative 4 would exceed the 2,000 metric tons CO_2e per year significance threshold. Due to the similar scale of Alternative 4 to the MPWSP, it is anticipated that implementation of measures similar to **Mitigation Measures 4.11-1** and **4.18-1** would be feasible and would reduce the impact to less than significant. Therefore, Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Since GHG emissions associated with Alternative 4 would be mitigated to a less-than-significant level, Alternative 4 would not conflict with Executive Order B-30-15. As with the proposed project, the only plan that would be directly applicable to Alternative 4 would be the AB 32 Scoping Plan Measure W-3, Water System Energy Efficiency. Pursuant to implementation of Mitigation Measure 4.11-1, the electricity that would supply Alternative 4 would be generated from renewable energy sources and/or would otherwise be offset through the procurement of Renewable Energy Certificates and/or retirement of Carbon Offsets. Therefore, Alternative 4 would result in the ***same impact conclusion*** as the proposed project; less than significant with mitigation.

Cumulative Analysis

Construction and operations under Alternative 4 would result in GHG emissions less than the applicable numeric significance threshold and would not conflict with AB 32 Scoping Plan Measure W-3 with implementation of mitigation. Therefore, Alternative 4 would not result in a cumulatively considerable contribution to significant cumulative impacts. Overall, Alternative 4 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to greenhouse gas emissions, less than significant with mitigation.

5.5.11.8 Direct and Indirect Effects of Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction and Operation Impacts

The facilities that would be constructed under Alternative 5a would be the same as those constructed under the proposed project, with the exception that there would be three fewer slant wells at CEMEX compared to the proposed project. Alternative 5b would locate the seven new slant wells at the Potrero Road parking lot, and include construction of a longer source water pipeline, as under Alternative 1. There would be an overall decrease in amortized construction emissions of 16 metric tons CO_2e per year under Alternative 5a compared to the proposed project. Given the longer distance of the source water pipeline under Alternative 5b, amortized construction emissions would be increased by approximately 59 metric tons CO_2e per year compared to Alternative 5a, and by approximately 44 metric tons CO_2e per year compared to the proposed project. In addition, due to the increased length of the source water pipeline, Alternative 5b would result in more than three times the energy demand to pump source water to the desalination plant compared to Alternative 5a; however, the overall energy demand associated with Alternative 5b would be less than the proposed project given the lower source water demand than the proposed project.

In addition, due to the desalination plant's decreased product capacity under Alternative 5a or 5b, total operational emissions would be less compared to emissions generated under the proposed project. With regard to CO_2 degassing from discharged water, given that Alternative 5a or 5b would result in approximately two thirds the discharged brine from the MPWSP plant compared to the proposed project, CO_2 degassing would be reduced to 490 metric tons CO_2 per year. It is assumed that approximately the same area would be permanently disturbed under Alternative 5a as the proposed project so the reduction in carbon sequestration would be the same, and under 5b would be less so the carbon sequestration would be greater. As shown in **Table 5.5-13**, the total GHG emissions that would be associated with Alternative 5a would be 5,530 metric tons CO_2e

per year, which would be approximately 2,835 metric tons less than would be generated under the proposed project. Alternative 5b would have the higher indirect operational emissions due to increased pumping associated with the longer source water pipeline length, and as described above, would have an additional 59 metric tons CO_2e per year associated with amortized construction emissions compared to Alternative 5a. The emissions of Alternatives 5a and 5b would exceed the 2,000 metric tons CO_2e per year significance threshold, but the impact would be less than significant with implementation of **Mitigation Measures 4.11-1** and **4.18-1**. Therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

TABLE 5.5-13
TOTAL GHG EMISSIONS ASSOCIATED WITH ALTERNATIVE 5A

Construction Emission Source	CO_2e (metric tons per year)
Amortized Construction[1]	342
Operations[2]	5,188
Total Emissions	5,530

NOTES:

1 Construction emissions are based on the emissions for the proposed project presented in Table 4.11-3 (rounded) with adjustments to the slant well emissions to account for construction of three fewer slant wells.

2 Operational emissions are based on emissions from Table 4.11-4 (rounded) with adjustments made to account for lower electricity consumption and emergency generation capacity due to the decreased product water capacity. In addition, due to the reduced capacity of the MPWSP plant under Alternative 5, degassing emissions would be two thirds the degassing emissions identified for proposed project, and because there would be maintenance of three fewer slant wells compared to the proposed project, emissions associated with off-road equipment use to maintain slant wells would be approximately 70 percent of the off-road equipment emissions identified for the proposed project.

SOURCES: ESA, 2016 (**See Appendix G1**).

Since mitigated GHG emissions associated with Alternative 5 would not exceed the emissions significance threshold, Alternative 5 would not conflict with Executive Order B-30-15. As with the proposed project, the only plan that would be directly applicable to Alternative 5 would be the AB 32 Scoping Plan Measure W-3, Water System Energy Efficiency. Pursuant to implementation of Mitigation Measure 4.11-1, the electricity that would supply Alternatives 5a or 5b would be generated from renewable energy sources and/or would otherwise be offset through the procurement of Renewable Energy Certificates and/or retirement of Carbon Offsets. Therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Cumulative Analysis

Combined Impacts with GWR Project

Because Alternative 5 alone would not meet the project objectives and must be paired with the approved GWR Project in order to do so, for informational purposes, this analysis provides the "subtotal" of the Alternative 5 impacts in combination with the impacts of the GWR Project, even though project-specific significance thresholds are not intended to be applied to combined or cumulative emissions levels. The GWR Project would emit amortized GHG emissions of

201 metric tons CO_2e per year and annual emissions of 1,699 metric tons CO_2e per year during operation, of which 1,642 metric tons CO_2e per year would be associated with new electrical demand. Total amortized emissions would be 1,900 metric tons CO_2e per year. These emissions are amortized or would occur over the GWR Project's expected 30-year lifetime (MRWPCA, 2016). Thus, during the years these projects overlap, the total amortized annual GHG emissions would be 7,631 metric tons CO_2e per year for Alternative 5a and slightly higher for Alternative 5b, a significant and unavoidable combined impact. These combined emissions would be approximately 734 metric tons CO_2e per year less than the emissions that would be associated with the proposed project. It should be noted that the GWR EIR did not include mitigation for GHG because the estimated CO_2e emissions are below the significance threshold. Overall, Alternative 5 considered in combination with the unmitigated GWR Project would result in a ***different impact conclusion*** compared to the proposed project for cumulative impacts related to GHG emissions; it would be significant and unavoidable even with implementation of mitigation for the Alternative 5 portion. However, if **Mitigation Measures 4.11-1** and **4.18-1** are also applied to the GWR Project, the combination of these projects would result in the ***same impact conclusion*** the proposed project, less than significant with mitigation.

Impacts of Full Cumulative Scenario

Similar to the proposed project, construction and operations under Alternative 5 would not result in GHG emissions greater than the significance threshold and would not conflict with AB 32 Scoping Plan Measure W-3. Therefore, with implementation of Mitigation Measure 4.11-1: GHG Emissions Reductions Plan, Alternative 5's contribution to GHG emissions would be less than significant and Alternative 5 would be considered consistent with the State's GHG reduction goals.

Overall, Alternative 5 would result in a reduced level of impact but the ***same impact conclusion*** as the proposed project for cumulative effects related to greenhouse gas emissions, less than significant with mitigation.

5.5.11.9 References

DeepWater Desal LLC., 2016. *Monterey Bay Regional Water Project, Project Narrative: Supplement to California State Lands Lease Application.* Available at www.deepwaterdesal.com/reports-and-publications.htm.

Monterey Regional Water Pollution Control Agency (MRWPCA), 2016. Consolidated Final EIR for the Pure Water Monterey GWR Project, Section 4.3, Air Quality and Greenhouse Gas. http://purewatermonterey.org/wp/wp-content/uploads/Volume-I-Consolidated-Final-EIR-Jan-2016.pdf

5.5.12 Noise and Vibration

The evaluation criteria for Noise and Vibration address: temporary increases in ambient noise in the vicinity of construction; exposure of people to noise levels in excess of established standards during construction; exposure of people to or generation of excessive groundborne vibration during construction; consistency with construction time limits established by local jurisdictions; substantial permanent increase in ambient noise levels above existing levels during project operations; and, exposure of people to noise levels in excess of established standards during operations. Construction of all project facilities will result in temporary increases in noise.

5.5.12.1 Setting/Affected Environment

The components of the alternatives that are common to the proposed project are located south of the Nashua Road/Highway 1 intersection and the setting/affected environment for those facilities is described in Section 4.12, Noise and Vibration. Alternative components north of the Nashua Road/Highway 1 intersection would primarily affect receptors in unincorporated Monterey County north of Charles Benson Road. This would include the primary residential area of Moss Landing along Potrero Road and Pieri Court, as well as intermittent rural residences along Nashua Road, Molera Road, Dolan Road and Via Tanques Road and houseboats at Moss Landing Harbor. Noise monitoring conducted along Potrero Road indicated daytime noise levels of 54.1 dBA. The regulatory environment of unincorporated Monterey County with respect to noise is discussed in Section 4.12.3 of this EIR/EIS.

5.5.12.2 Direct and Indirect Effects of the Proposed Project (Slant Wells at CEMEX)

The proposed project extends from Castroville in the north to the city of Carmel in the south (see **Figure 3-2**) and would include construction of a desalination plant on 25 acres along Charles Benson Road northeast of the City of Marina, up to nine new subsurface slant wells at the CEMEX active mining area, two new wells (ASR-5 and ASR-6) at the existing Seaside Groundwater Basin aquifer storage and recovery (ASR) system, the Carmel Valley Pump Station, and about 21 miles of water conveyance pipelines. The direct and indirect impacts of the proposed project are described in detail in Section 4.7.5.

Impact 4.12-1: Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity during construction.

Impact 4.12-2: Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during construction.

Construction of the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline, Pipeline to the CSIP Pond, and Brine Discharge Pipeline would result in less-than-significant daytime and nighttime noise impacts. Construction of ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, Main System-Hidden Hills Interconnection Improvements, and Ryan Ranch-Bishop Interconnection Improvements would result in a less-than-significant impact related to temporary increases in daytime noise levels and no impact related to nighttime noise. Significant impacts related to temporary increases in daytime noise levels would result during construction of the ASR-5 and ASR-6 Wells and the Carmel Valley Pump Station, but these impacts would be reduced to less-than-significant levels with implementation of the prescribed mitigation measures. Significant nighttime noise impacts would result during construction of the new Desalinated Water Pipeline, Castroville Pipeline, new Transmission Main, and the ASR-5 and ASR-6 Wells. With the exception of nighttime noise impacts associated with the Castroville Pipeline Optional Alignment 1 and ASR-5 and ASR-6 Wells, implementation of **Mitigation Measures 4.12-1a** (**Neighborhood Notice**), **4.12-1b** (**General Noise Controls for Construction Equipment**) and **4.12-1c** (**Noise Control Plan for Nighttime Pipeline Construction**) would reduce all other construction-related nighttime noise impacts to a less-than-significant level. Nighttime noise impacts during installation of the Castroville Pipeline Optional Alignment 1 and during drilling and development of the ASR-5 and ASR-6 Wells would remain significant and unavoidable, even with implementation of mitigation.

There are no established construction noise level standards that would apply to the ASR-5 and ASR-6 Wells. Construction of the subsurface slant wells, Source Water Pipeline, Brine Discharge Pipeline, Pipeline to the CSIP Pond, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, Carmel Valley Pump Station, and MPWSP Desalination Plant would result in less-than-significant impacts with regard to the generation of construction noise levels in excess of local noise level standards.

Construction of the remaining project components (new Desalinated Water Pipeline, Castroville Pipeline, new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline) would generate noise levels in excess of local noise level standards. The new Desalinated Water Pipeline and new Transmission Main would exceed the City of Marina's 60-dBA noise level standard for construction noise, a significant impact. In the absence of project-specific information regarding noise-reduction measures that would be implemented during project construction, it is conservatively assumed that noise resulting from construction of ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline would violate Noise Policy B-9 of the Fort Ord Reuse Plan, a significant impact. Implementation of **Mitigation Measures 4.12-1b** and **4.12-1c** would reduce these impacts to a less-than-significant level.

Impact 4.12-3: Exposure of people to or generation of excessive groundborne vibration during construction.

Construction of the subsurface slant wells, MPWSP Desalination Plant, Pipeline to the CSIP Pond, Brine Discharge Pipeline ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Carmel Valley Pump Station, and Main System-Hidden Hills Interconnection Improvements would result in less-than-significant vibration impacts with regard to both structural damage and human annoyance. There could be significant vibration impacts related to structural damage and human annoyance from construction of the Castroville Pipeline and Source Water Pipeline, as well as the new Desalinated Water Pipeline and new Transmission Main where trenchless construction methods are required for these pipelines. However, with implementation of the **Mitigation**

Measures 4.12-3 (**Vibration Reduction Measures**) and **4.15-1a** (**Avoidance and Vibration Monitoring for Pipeline Installation in the Lapis Sand Mining Plant Historic District**), all significant construction vibration impacts would be reduced to a less-than-significant level.

Impact 4.12-4: Consistency with the construction time limits established by the local jurisdictions.

Several of the proposed facilities could require nighttime construction. Construction of the Slant Wells and Source Water Pipeline would not be subject to the city of Marina's construction time limits, which only apply to outdoor construction activities adjacent to residential land uses. Construction of the Desalinated Water Pipeline and new Transmission Main within the City of Marina would be consistent with construction time limits because work within the City would only be conducted during daytime hours. The southern portion of the new Transmission Main would be constructed within the City of Seaside. Because the City of Seaside Municipal Code will allow construction activity outside listed hours under certain circumstances, the construction activities would not violate local regulations and the impact would be less than significant. All nighttime construction work would be conducted only with prior approval from the relevant jurisdictions. **Mitigation Measure 4.12-1c** (**Noise Control Plan for Nighttime Pipeline Construction**) would reduce the nighttime construction noise impact but would not change the inconsistency with the restriction of the noise ordinance.

The Desalination Plant, Pipeline to the CSIP Pond, Castroville Pipeline, and Brine Discharge Pipeline could require nighttime construction but there are no local construction time limits that would apply; no impact would result. None of the remaining facilities would require nighttime construction and therefore, the remaining facilities would be consistent with applicable construction time limits.

Impact 4.12-5: Substantial permanent increases in ambient noise levels in the project vicinity above levels existing without the project during operations.

Operation of the subsurface slant wells, MPWSP Desalination Plant, Ryan Ranch-Bishop Interconnection Improvements, and Carmel Valley Pump Station would result in less-than-significant noise impacts with regard to permanent operational noise increases. Significant noise impacts would result from operation of the ASR-5 and ASR-6 Wells and the booster stations that would be upgraded by the Main System-Hidden Hills Interconnection Improvements; however, implementation of **Mitigation Measure 4.12-5** (**Stationary Source Noise Controls**) would reduce all significant operational noise impacts to a less-than-significant level. No impact would result from operation of the proposed pipelines.

Impact 4.12-6: Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during operations.

Operation of the Subsurface Slant Wells, MPWSP Desalination Plant, Source Water Pipeline, Pipeline to the CSIP Pond, Brine Discharge Pipeline, Desalinated Water Pipeline, Transmission Main, Ryan Ranch-Bishop Interconnection Improvements, Carmel Valley Pump Station, the booster stations that would be upgraded by the Main System-Hidden Hills Interconnection

Improvements would result in less than significant noise impacts with regard to generation of noise levels in excess of local noise level standards. No impact would result from operation of the ASR-5 and ASR-6 Wells with regard to generation of noise in excess of local noise level standards because none would apply to these sources on federal lands. No impact would result from operation of the proposed pipelines because the pipelines would not involve the installation of stationary noise sources.

Impact 4.12-C: Cumulative impacts related to noise and vibration.

MPWSP pipeline construction noise could combine with one or more of five cumulative projects to cause nighttime noise levels to exceed the sleep interference threshold. Nighttime construction noise could have a significant contribution to a significant cumulative effect.

Ten cumulative projects would potentially occur within the 120-foot geographic scope of cumulative vibration impacts analysis but four of these cumulative projects (Nos. 31, 35, 55, and 63) would not be located within 120 feet of any sensitive receptors or structures and, therefore, would not contribute to cumulative impacts. However, the project-specific vibratory impact monitoring required under **Mitigation Measure 4.12-3** (**Vibration Reduction Measures**) would also capture vibration contributed by the other six cumulative projects, should the timing and location of construction overlap, Consequently, no significant cumulative construction-related vibration impact would result.

The MPWSP's project-specific operational noise impacts would be less than significant for the MPWSP Desalination Plant and the Carmel Valley Pump Station. Impacts of the ASR well facilities and the Main System-Hidden Hills Interconnection Improvements would be less than significant with mitigation. There are no cumulative projects within 500 feet of these proposed facilities. Therefore, no other projects could combine with the operational noise effects of the proposed project to result in a significant cumulative impact.

5.5.12.3 Direct and Indirect Effects of No Project Alternative

Under the No Project Alternative, no new facilities would be constructed or operated and the existing test slant well would be decommissioned. Consequently, there would be no construction- or operations-related noise or vibrations associated with the No Project Alternative. Because the No Project Alternative would have no direct or indirect impacts with respect to noise or vibrations, it could not contribute to cumulative effects related to these topics.

5.5.12.4 Direct and Indirect Effects of Alternative 1 - Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.3.3.2, Intake Option 3 – Subsurface Slant Wells at Potrero Road). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the

Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**). Therefore, the noise impact analysis of Alternative 1 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 1.

Construction Impacts

The construction of the additional pipeline north of the Nashua Road/Highway 1 intersection in unincorporated Monterey County would temporarily increase noise levels at intermittent rural residences along Nashua Road and Molera Road, and at the primary residential area of Moss Landing along Potrero Road. Some of these receptors would be as close as 50 feet from the Source Water Pipeline installation trench.

Construction of the additional Source Water Pipeline under Alternative 1 is estimated to progress at a rate of approximately 250 feet per day, so the maximum noise levels at any one location would be limited to a period of 1 to 3 days. Consequently, although construction noise at adjacent residences could exceed the speech interference threshold of 70 dBA, the duration of the impact at any given sensitive noise receptor would be less than two weeks. While the construction noise impact associated with increases in daytime noise levels along this additional segment of pipeline would be less than significant, construction of other components common to the proposed project would be reduced to a less than significant level with **Mitigation Measures 4.12-1a** (**Neighborhood Notice**), **4.12-1b** (**General Noise Controls for Construction Equipment**). Therefore, Alternative 1 would result in the ***same impact conclusion*** on daytime noise levels as the proposed project, less than significant with mitigation.

If nighttime work were to be conducted along the extended portions of the Source Water Pipeline along Potrero Road, Molera Road and Nashua Road noise from construction equipment could exceed the sleep interference threshold of 60 dBA. Implementation of **Mitigation Measures 4.12-1a** (**Neighborhood Notice**), **4.12-1b** (**General Noise Controls for Construction Equipment**), and **4.12-1c** (**Noise Control Plan for Nighttime Pipeline Construction**) would reduce the severity of this impact but not to below the sleep interference threshold of 60 dBA, L_{eq}. Nighttime noise impacts during installation of the Castroville Pipeline Optional Alignment 1 and during drilling and development of the ASR-5 and ASR-6 Wells would remain significant and unavoidable, even with implementation of mitigation. Consequently, construction related noise increases under Alternative 1 would result in the ***same impact conclusion*** as the proposed project, significant unavoidable, even with mitigation.

Installation of Subsurface Slant Wells would occur closer to noise sensitive receptors (1,000 feet) than the proposed project (4,000 feet). However, the distance is still sufficient to attenuate noise to below both the speech interference and sleep interference thresholds and Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Monterey County Policy S-7.9 requires the project sponsor to complete a noise mitigation study if construction noise would exceed the “acceptable” levels listed in Policy S-7.1 within 500 feet of a noise-sensitive land use during evening hours. Because the Source Water Pipeline west of

Highway 1 would be within 100 feet from the nearest receptors on Potrero Road, Molera Road and Nashua Road, **Mitigation Measure 4.12-1c** (**Noise Control Plan for Nighttime Pipeline Construction**) would be required to reduce this impact to less than significant. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project for noise impacts during construction, less than significant with mitigation.

Vibration impacts would be less than significant for the additional 5.5 mile Source Water Pipeline construction under Alternative 1 because it would no longer occur adjacent to a historic structure (CEMEX building) as it would for the proposed project. Further, vibration impacts on residential uses along the Potrero Road alignment would result in human annoyance impacts from vibration. Implementation of **Mitigation Measure 4.12-3** (**Vibration Reduction Measures**) would reduce impacts to less than significant. Therefore, Alternative 1 would result in the ***same impact conclusion*** from vibration as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

Alternative 1 would operate the slant wells closer to noise sensitive receptors (1,000 feet) than the proposed project (4,000 feet). Simultaneous operation of 8 well pumps would conservatively generate a noise level of approximately 66 dBA at 50 feet. At 1,000 feet, slant well pump noise would be reduced to 40 dBA, which is below ambient levels monitored along Potrero Road (54 dBA, L_{eq}) and would not contribute to a substantial permanent increase in ambient noise levels.

All remaining components would be the same as the proposed project and would result in less-than-significant operational noise impacts with implementation of **Mitigation Measure 4.12-5** (**Stationary Source Noise Controls**). Consequently, operation of the slant wells within unincorporated Monterey County would result in less than significant noise impacts with regard to generation of noise levels in excess of local noise level standards as well as to permanent increases in noise levels. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Policy S-7.6 of the County General Plan Noise Element requires an acoustical analysis for proposed noise generators that produce a noise level exceeding 85 dBA at 50 feet from the source. Simultaneous operation of the 8 slant well pumps would conservatively generate a noise level of approximately 66 dBA at 50 feet and would be consistent with noise policies of the County General Plan. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

No additional cumulative projects would be within the geographic scope of the cumulative analysis for construction-related vibration impacts (within 120 feet of Alternative 1 components whose construction-related vibration could cause damage to structures); therefore, the analysis of cumulative vibration impacts would be the same as that described for the proposed project, with the exception that no construction would occur adjacent to a historic structure (CEMEX building), so cumulative impacts from construction vibration would be reduced compared to the proposed project. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to vibration during construction, less than significant with mitigation.

The components of Alternative 1 that would result in operational noise are the same as for the proposed project. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project for cumulative noise impacts during operation, less than significant.

The geographic scope of analysis for cumulative noise impacts during construction is defined by the presence of sensitive receptors within 500 feet of components whose daytime construction noise could exceed speech interference thresholds or whose nighttime construction noise could exceed sleep interference thresholds. These components include the Source Water Pipeline and the slant wells.

One additional cumulative project described in **Table 4.1-2** in Section 4.1 would have the potential to combine with Alternative 1 to result in cumulative noise impacts during construction: the DeepWater Desal Project (No. 34). In the absence of detailed information regarding cumulative project construction equipment and exact construction phase timing, a quantitative assessment of cumulative nighttime noise impact cannot be reasonably conducted. However, it is conservatively assumed that the potential exists for residual (post-mitigation) MPWSP pipeline and slant well construction noise to combine with that of the DeepWater Desal Project to cause nighttime noise levels to exceed the sleep interference threshold. As a result, temporary cumulative increases in nighttime construction noise could result in a cumulatively significant nighttime noise impact. No additional mitigation within the scope of this EIR/EIS is available to further reduce the potential for a cumulatively significant nighttime noise impact. Nighttime construction noise could have a significant contribution to a significant and unavoidable cumulative effect. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, significant and unavoidable, even with mitigation.

5.5.12.5 Direct and Indirect Effects of Alternative 2 - Open Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a new, screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station on Dolan Road (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water that originated from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to Castroville Community Services District would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**). Therefore, the noise impact analysis of Alternative 2 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 2.

Construction Impacts

The construction of a centralized bore pit/pump station and HDD activities associated with the source water pipeline to the open water intake as well as the additional 6.5 miles of open trench pipeline construction, would temporarily increase noise levels at intermittent rural residences along Nashua Road and Molera Road and at the primary residential area of Moss Landing along Potrero Road and Pieri Court. Some of these receptors would be as close as 50 feet from the pipeline installation trench.

Construction of the 6.5 miles of Source Water Pipeline is estimated to progress at a rate of approximately 250 feet per day, so the maximum noise levels at any one location would be limited to a period of 1 to 3 days. Consequently, although construction noise at adjacent residences could exceed the speech interference threshold of 70 dBA, the duration of the impact at any given sensitive noise receptor would be less than two weeks. While the construction noise impact associated with increases in daytime noise levels along this additional segment of pipeline would be less than significant, construction of other components common to the proposed project would be less than significant with **Mitigation Measures 4.12-1a** (**Neighborhood Notice**), **4.12-1b** (**General Noise Controls for Construction Equipment**). Overall, Alternative 2 would, result in the ***same impact conclusion*** on daytime noise levels as the proposed project, less than significant with mitigation.

If nighttime work were to be conducted along the additional 6.5 miles of Source Water Pipeline, noise from construction equipment could exceed the sleep interference threshold of 60 dBA, a potentially significant impact. Implementation of **Mitigation Measures 4.12-1a** (**Neighborhood Notice**), **4.12-1b** (**General Noise Controls for Construction Equipment**), and **4.12-1c** (**Noise Control Plan for Nighttime Pipeline Construction**) would reduce the severity of this impact but not to below the sleep interference threshold of 60 dBA, L_{eq}. However, nighttime noise impacts during installation of the Castroville Pipeline, and drilling and development of the ASR-5 and ASR-6 Wells, would remain significant and unavoidable, even with implementation of mitigation. Consequently, construction related noise increases under Alternative 2 would result in an increased level of impact compared to the proposed project. Therefore, Alternative 2 would have the ***same impact conclusion*** as the proposed project, significant unavoidable, even with mitigation.

Installation of the screened open water intake would occur closer to noise sensitive receptors (1,300 feet) than the subsurface slant wells of the proposed project (4,000 feet). The HDD boring pit would require sheet pile installation and is 1,500 feet from live-aboard residents in the Moss Landing Marina. Additionally, drilling activities would occur at the HDD pit and reaming and pipeline installation would occur from barges approximately 1,300 feet from live-aboard marina residents. Noise from drilling, reaming, and pipeline installation would be 57 dBA, L_{eq}, which would be below the speech interference threshold for daytime work and below the sleep interference threshold for nighttime work. Sheet pile installation, which would be conducted for railroad and water crossings and would occur during daytime hours, would temporarily generate substantial noise levels that would dominate over other construction activity associated with trenchless construction. Sheet pile installation would generate noise level of 64.4 dBA, L_{eq} which would be below the speech interference threshold for daytime work. Therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant impact.

For Monterey County-permitted projects, Policy S-7.9 requires the project sponsor to complete a noise mitigation study if construction noise would exceed the “acceptable” levels listed in Policy S-7.1 within 500 feet of a noise-sensitive land use during evening hours. Because the Source Water Pipeline west of Highway 1 would be within 100 feet from the nearest receptors on Potrero Road, Molera Road and Nashua Road, construction activities would be inconsistent with this policy. However, implementation of **Mitigation Measure 4.12-1c** (**Noise Control Plan for Nighttime Pipeline Construction**) would reduce this impact to less than significant. Therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Vibration impacts would be reduced under Alternative 2 because construction of the Source Water Pipeline would no longer occur adjacent to a historic structure (CEMEX building) as it would under the proposed project. Vibration impacts on residential uses along the Nashua Road and Molera Road alignments would be similar to those identified for the proposed project for open trench construction. Implementation of **Mitigation Measure 4.12-3** (**Vibration Reduction Measures**) would reduce impacts to less than significant. All remaining components of Alternative 2 would be the same as the proposed project and Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

The Pump Station for the screened open water intake would operate closer to noise sensitive receptors (1,500 feet) than the Slant Well pumps under the proposed project (4,000 feet). It would contain four centrifugal intake pumps (three operating and one stand-by), each with a rated capacity of approximately 12,000 GPM. The pumps would be located below grade and the simultaneous operation would conservatively generate a noise level of approximately 61 dBA at 50 feet, accounting for attenuation resulting from their below grade location and the presence of the surrounding building and, thereby consistent with noise policies of the County General Plan. Therefore Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant.

At 1,500 feet, the intake Pump Station noise would be reduced to 32 dBA, which is below ambient levels and would not contribute meaningfully to ambient levels. All remaining components would be the same as the proposed project with implementation of **Mitigation Measure 4.12-5** (**Stationary Source Noise Controls**). Therefore, Alternative 2 would result in ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Cumulative Analysis

No additional cumulative projects would be within the geographic scope of the cumulative analysis for vibration impacts (within 120 feet of Alternative 2 components whose construction-related vibration could cause damage to structures); therefore, the analysis of cumulative vibration impacts would be the same as that described for the proposed project. The components of Alternative 2 that would result in operational noise are the same as for the proposed project; therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to vibration during construction, less than significant with mitigation.

The geographic scope of analysis for cumulative noise impacts during construction is defined by the presence of sensitive receptors within 500 feet of components whose daytime construction noise could exceed speech interference thresholds or whose nighttime construction noise could exceed sleep interference thresholds. These components include the Source Water Pipeline, screened seawater intake, and Intake Pump Station.

One additional cumulative project described in **Table 4.1-2** in Section 4.1 would have the potential to combine with Alternative 2 to result in cumulative noise impacts during construction: the DeepWater Desal Project (No. 34). In the absence of detailed information regarding cumulative project construction equipment and exact construction phase timing, a quantitative assessment of cumulative nighttime noise impact cannot be reasonably estimated. However, it is conservatively assumed that the potential exists for residual (post-mitigation) pipeline, Intake and Pump Station construction noise to combine with that of the DeepWater Desal Project to cause nighttime noise levels to exceed the sleep interference threshold. As a result, temporary cumulative increases in nighttime construction noise could result in a cumulatively significant nighttime noise impact. No additional mitigation within the scope of this EIR/EIS is available to further reduce the potential for a cumulatively significant nighttime noise impact. Therefore, nighttime construction noise could have a significant contribution to a significant and unavoidable cumulative effect, similar to the proposed project.

Overall, Alternative 2 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to noise, significant and unavoidable, even with mitigation.

5.5.12.6 Direct and Indirect Effects of Alternative 3 - the Monterey Bay Regional Water Project

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The pipelines for the intake and discharge systems would be installed using HDD. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-3**, ASR 5 and 6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water that originated from the

Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**). Therefore, the impact analysis of Alternative 3 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 3.

Construction Impacts

Construction of open trench pipeline installation and a centralized pump station/boring pit north of Nashua Road/Highway 1 intersection would temporarily increase noise levels at intermittent rural residences along Nashua Road and Molera Road and at the primary residential area of Moss Landing along Potrero Road and Pieri Court. Some of the receptors would be as close as 50 feet from the installation trench. In addition, this alternative would include construction of a larger desalination plant, data center and cooling system, and up to 31.5 miles of additional desalinated water pipelines to deliver water (above the 9.6 mgd demand from CalAm's Monterey District service area) to potential customers in Santa Cruz County, Salinas, or both, resulting in more receptors exposed to construction noise.

Construction of the Desalinated Water Pipeline is estimated to progress at a rate of approximately 250 feet per day, so the maximum noise levels at any one location would be limited to a period of 1 to 3 days. Consequently, although construction noise at adjacent residences could exceed the speech interference threshold of 70 dBA, the duration of the impact at any given sensitive noise receptor would be less than two weeks. Therefore, the construction noise impact associated with increases in daytime noise levels would be less than significant.

If nighttime work were to be conducted along the Desalinated Water Pipeline, noise from construction equipment could exceed the sleep interference threshold of 60 dBA, a significant impact. Implementation of **Mitigation Measures 4.12-1a** (**Neighborhood Notice**), **4.12-1b** (**General Noise Controls for Construction Equipment**), and **4.12-1c** (**Noise Control Plan for Nighttime Pipeline Construction**) would reduce the severity of this impact, but not to below the sleep interference threshold of 60 dBA, L_{eq}.

The HDD pit would require sheet pile installation, which is 1,500 feet from live-aboard residents of the Moss Landing Marina. Additionally, drilling activities would occur at the HDD pit and reaming and pipeline installation would occur from barges approximately 1,300 feet from live-aboard marina residents. Noise from drilling reaming and pipeline installation would be 57 dBA, L_{eq}, which would be below the speech interference threshold for daytime work and below the sleep interference threshold for nighttime work and represent a less than significant impact.

Sheet pile installation, which would occur during daytime hours, is estimated to generate a noise level of 64.4 dBA, L_{eq}, which would be below the speech interference threshold for daytime work.

Construction of the desalination facility, data center and cooling system would occur as close as 600 feet from the nearest receptor on Dolan Road. However, this distance is sufficient to attenuate construction noise to 59.0 dBA, which would be below both the speech interference and sleep interference thresholds. All remaining components would be the same as the proposed project. Therefore, Alternative 3 would result in the ***same impact conclusion*** as the proposed project from construction-related noise, significant and unavoidable, even with mitigation.

Alternative 3 would construct pipelines, a desalination facility, and a data center and cooling system within unincorporated Monterey County where, for County-permitted projects, Policy S-7.9 requires the project sponsor to complete a noise mitigation study if construction noise would exceed the “acceptable” levels listed in Policy S-7.1 within 500 feet of a noise-sensitive land use during evening hours. Because the additional length of pipelines, desalination facility, data center and cooling system would be within 100 feet from the nearest receptors on Dolan Road, Via Tanques Road, Potrero Road, Molera Road and Nashua Road, construction activities would be inconsistent with this policy and **Mitigation Measure 4.12-1c** (**Noise Control Plan for Nighttime Pipeline Construction**) would be required to reduce this impact to a less than significant level. All remaining components would be the same as the proposed project and Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Vibration impacts would not occur adjacent to a historic structure (CEMEX building). All remaining components would be the same as the proposed project, requiring implementation of **Mitigation Measure 4.12-3** (**Vibration Reduction Measures**) near residences. Therefore, Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

Alternative 3 would include an additional source of noise not associated with the proposed project. Noise sources associated with the data center and cooling system would include an unspecified number of natural gas fired emergency backup generators of up to 10 MW in size that could operate up to 4 hours per day or 1,500 hours per year. Equipment associated with power plants of this size can result in operational noise levels of approximately 65 dB at 300 feet (Siemens AG, 2005). Thus, the operation of generators has the potential to increase noise levels over 5 dBA above existing noise levels at the nearest sensitive receptors. Mitigation of operational noise levels of natural gas fired emergency backup generators is feasible to establish a performance standard of 5 dBA increase over existing noise levels to address this potential impact. To ensure that the operational noise impact would be reduced to a less-than-significant level, implementation of **Mitigation Measure ALT 3-NO** would be required.

Mitigation Measure ALT 3-NO applies to the emergency backup generators associated with the Alternative 3 data center and cooling system and would not apply to the proposed project or other alternatives.

Mitigation Measure ALT 3-NO: Operational Performance Noise Standard for Data Center Generators

Proposed generators shall include acoustical shielding, critical grade exhaust silencers and/or low pressure loss silencers at the intake and exhaust vents sufficient to achieve a noise level no greater than 5 dBA above the existing nighttime noise level at the nearest sensitive receptor.

Thus, in combination with the components unique to Alternative 3 and those in common with the proposed project, Alternative 3 would result in an increased level of impact but the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

As stated earlier, the data center and cooling system would be located 600 feet or further from the nearest receptor on Dolan Road. Policy S-7.4 of the Monterey County General Plan Noise Element requires an acoustical analysis for proposed noise generators that are likely to produce noise levels exceeding the levels shown in the adopted Community Noise Ordinance when received at existing or planned noise-sensitive receptors. The Monterey County Code, Chapter 10.60, Noise Control, Section 10.60.030 limits the operation of any machine, mechanism, device, or contrivance that produces a noise level exceeding 85 dBA at 50 feet from the source. Assuming the data center generators as a point source operating at 65 dB at 300 feet, acoustical equations yield a noise level of 81 dBA at 50 feet. Consequently, the emergency backup generators would be consistent with noise policies of the County General Plan. Therefore Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

No additional cumulative projects would be within the geographic scope of the cumulative analysis for construction-related vibration impacts (within 120 feet of Alternative 3 components whose construction-related vibration could cause damage to structures); therefore, the analysis of cumulative vibration impacts would be the same as that described for the proposed project, with the exception that no construction would occur adjacent to a historic structure (CEMEX building), so cumulative impacts from construction vibration would be reduced compared to the proposed project. The components of Alternative 3 that are common with the proposed project would result in the same operational noise impacts; therefore, the analysis of cumulative noise impacts during operation of those components is the same as described in Section 4.12.6. The desalination plant would be in a different location and the data center and backup generators would be new sources of operational noise compared to the proposed project, but no projects relevant to the cumulative scenario for Alternative 3 would be located within 500 feet of these components and create new sources of noise; therefore, the cumulative analysis associated with these components is the same as described above for Alternative 3 alone.

The geographic scope of analysis for cumulative noise impacts during construction is defined by the presence of sensitive receptors within 500 feet of components whose daytime construction noise could exceed speech interference thresholds or whose nighttime construction noise could exceed sleep interference thresholds. These include the additional pipelines, desalination facility, data center and ancillary equipment.

One additional cumulative project described in **Table 4.1-2** in Section 4.1 would have the potential to combine with Alternative 3 to result in cumulative noise impacts during construction: the GWR Project (No. 59). In the absence of detailed information regarding exact construction phase timing, a quantitative assessment of cumulative nighttime noise impact cannot be reasonably estimated. However, it is conservatively assumed that the potential exists for residual (post-mitigation) construction noise to combine with that of the GWR Project to cause nighttime noise levels to exceed the sleep interference threshold. As described in the FEIR for the GWR Project, construction activities associated with the injection well facilities of the GWR Project, which would be located within 500 feet of the southern end of the new Transmission Main, would result in significant and nighttime noise impacts that would be reduced to a less than significant level with implementation of adopted mitigation measures (MRWPCA, 2016). The new Transmission Main also would result in less-than-significant noise impacts after implementation of mitigation, as described in Section 4.12.6.1. As a result, temporary cumulative increases in nighttime construction noise could result in a cumulatively significant nighttime noise impact that would be increased compared to either Alternative 3 or the GWR Project alone, and could remain significant and unavoidable even with mitigation specified for each project. No additional mitigation within the scope of this EIR/EIS is available to further reduce the potential for a cumulatively significant nighttime noise impact. Therefore, nighttime construction noise could have a significant contribution to a significant cumulative impact.

Overall, Alternative 3 would result in an increased severity but the ***same impact conclusion*** as the proposed project for cumulative effects related to construction noise, significant and unavoidable, even with mitigation.

5.5.12.7 Direct and Indirect Effects of Alternative 4 - the People's Moss Landing Water Desalination Project

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water that originated from the Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**). Therefore, the impact analysis of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4.

Construction Impacts

Alternative 4 would construct intake and brine discharge pipelines and a pump station on the beach and adjacent to the Monterey Bay Aquarium Research Institute that would require HDD equipment and marine barge(s), and require additional lengths of Source Water and Desalinated Water Pipelines. Sheet pile installation, which would occur during daytime hours, would generate a noise level of 75.8 dBA, L_{eq} which is above the speech interference threshold for daytime work. Implementation of **Mitigation Measures 4.12-1a** (**Neighborhood Notice**) and **4.12-1b** (**General**

Noise Controls for Construction Equipment) would reduce impacts to less-than-significant levels.

Construction of the desalination facility would occur as close as 420 feet from the live aboard receptors at Moss Landing Marina. This distance is sufficient to attenuate construction noise to 62.0 dBA, which would be below the speech interference threshold for daytime work but above the sleep interference threshold for nighttime work. Thus, Alternative 4 would result in exposure of additional receptors to nighttime construction noise compared to the proposed project. Implementation of **Mitigation Measures 4.12-1c** (**Noise Control Plan for Nighttime Pipeline Construction**) and **4.12-1e** (**Offsite Accommodations for Substantially Affected Receptors**) would reduce impacts to less than significant.

Alternative 4 would construct pipelines and a desalination facility within unincorporated Monterey County where, Policy S-7.9 requires the project sponsor to complete a noise mitigation study if construction noise would exceed the "acceptable" levels listed in Policy S-7.1 within 500 feet of a noise-sensitive land use during evening hours. Because the additional length of pipelines and desalination facility would be within 500 feet from the nearest receptors at the Moss Landing Marina, Potrero Road, Molera Road and Nashua Road, construction activities would be inconsistent with this policy and **Mitigation Measure 4.12-1c** (**Noise Control Plan for Nighttime Pipeline Construction**) would be required to reduce this impact to less than significant. All remaining components of Alternative 4 would be the same as the proposed project, and nighttime noise impacts during drilling and development of the ASR-5 and ASR-6 Wells would remain significant an unavoidable. Therefore, Alternative 4 would result in the ***same impact conclusion*** as the proposed project related to noise impacts, significant and unavoidable, even with mitigation.

Because nighttime construction of the additional length of Desalinated Water Pipeline would occur, Alternative 4 would exceed the significance threshold for sleep interference due to the proximity of additional sensitive receptors on Potrero Road and Nashua Road. Implementation of **Mitigation Measures 4.12-1a**, **4.12-1b**, **4.12-1c**, and **4.12-1e** would reduce impacts to a less-than-significant level for the Potrero Road residences, but would not reduce the impact to less than significant for Nashua Road residences. All remaining components would be the same as the proposed project and Alternative 4 would result in the ***same impact conclusion*** as the proposed project, significant and unavoidable, even with mitigation.

Vibration impacts would not occur adjacent to a historic structure (CEMEX building). All remaining components would be the same as the proposed project, requiring implementation of **Mitigation Measure 4.12-3** (**Vibration Reduction Measures**) near residences. Therefore, Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

Alternative 4 would locate the desalination facility and intake pump station closer to additional sensitive receptors than the proposed project. Operational noise from the desalination plant and pump station could result in a noise impact in excess of 5 dBA above existing levels at live-aboard residences of the Moss Landing Marina, approximately 420 feet away from each respective source. Existing ambient noise levels at the Marina are elevated due to the presence of Highway 1 and operations of the Moss Landing Power Plant. Mitigation measures would likely be required to ensure compliance with a performance standard of no more than a 5 dBA increase over existing noise levels and ensure that plant and inlet pump operations would not result in a significant permanent increase in noise levels. To ensure that the operational noise impact would be reduced to a less-than-significant level, implementation of **Mitigation Measure ALT 4-NO** would be required.

Mitigation Measure ALT 4-NO applies to the Alternative 4 desalination plant and intake pump station and would not apply to the proposed project or other alternatives.

> **Mitigation Measure ALT 4-NO: Operational Performance Noise Standard for Desalination Facilities and Pump Station**
>
> Proposed generators shall include acoustical shielding sufficient to achieve a noise level no greater than 5 dBA above the existing nighttime noise level at the nearest sensitive receptor.

All remaining components of Alternative 4 would result in an increased level of impact compared to the proposed project. Thus, Alternative 4 would have the ***same impact conclusion*** as the proposed project related to operational noise, less than significant impacts with mitigation.

Desalination equipment and pumps would be installed in unincorporated Monterey County. Policy S-7.6 of the County Plan Noise Element requires an acoustical analysis for proposed noise generators that produce a noise level exceeding 85 dBA at 50 feet from the source. The RO system at the Desalination Plant would include a series of pumps, but these would be located inside the treatment building and are not expected to generate substantial noise and would hence be unlikely to generate noise levels exceeding 85 dBA at 50 feet. Alternative 4 would result in an increased level of impact compared to the proposed action, but would have the ***same impact conclusion***, less than significant.

Cumulative Analysis

No additional cumulative projects would be within the geographic scope of the cumulative analysis for construction-related vibration impacts (within 120 feet of Alternative 4 components whose construction-related vibration could cause damage to structures); therefore, the analysis of cumulative vibration impacts would be the same as that described for the proposed project, with the exception that no construction would occur adjacent to a historic structure (CEMEX building). Cumulative impacts from construction vibration would be reduced compared to the proposed project.

The geographic scope of analysis for cumulative noise impacts during construction is defined by the presence of sensitive receptors within 500 feet of components whose daytime construction noise could exceed speech interference thresholds or whose nighttime construction noise could exceed sleep interference thresholds. These include the additional pipelines and the desalination facility.

One additional cumulative project described in **Table 4.1-2** in Section 4.1 would have the potential to combine with Alternative 4 to result in cumulative noise impacts: the DeepWater Desal Project (No. 34). In the absence of detailed information regarding cumulative project construction equipment and exact construction phase timing, a quantitative assessment of cumulative nighttime noise impact cannot be reasonably estimated. However, it is conservatively assumed that the potential exists for residual (post-mitigation) construction noise to combine with that of the DeepWater Desal Project to cause nighttime noise levels to exceed the sleep interference threshold. As a result, temporary cumulative increases in nighttime construction noise could result in a cumulatively significant nighttime noise impact. No additional mitigation within the scope of this EIR/EIS is available to further reduce the potential for a cumulatively significant nighttime noise impact. Therefore, nighttime construction noise of Alternative 4 could have a significant contribution to a significant and unavoidable cumulative effect, similar to the proposed project.

The components of Alternative 4 that are common with the proposed project would result in the same operational noise impacts; therefore, the analysis of cumulative noise impacts during operation of those components is the same as described in Section 4.12.6. The DeepWater Desal desalination plant and data center would be greater than 500 feet from the Alternative 4 facilities and would therefore be outside the geographic scope for cumulative operational noise impacts. No other cumulative projects would be within 500 feet of components unique to Alternative 4 that would generate operational noise.

Overall, Alternative 4 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to noise and vibration, significant and unavoidable, even with mitigation.

5.5.12.8 Direct and Indirect Effects of Project Alternatives 5a and 5b

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction Impacts

Alternative 5a would construct the same facilities, with fewer slant wells and a smaller desalination plant, in the same locations as the proposed project, and construction-related increases in ambient noise for the slant well installation would be less than significant. All other construction noise impacts would be the same as the proposed project. Even with implementation of mitigation measures, Alternative 5a would have a significant and unavoidable increase in noise levels during nighttime construction of pipeline segments close to sensitive receptors and at the ASR-5 and ASR-6 wells. Therefore, Alternative 5a would result in a ***same impact conclusion*** as the proposed project, significant and unavoidable, even with mitigation.

Alternative 5b would construct the same facilities, with fewer slant wells and a smaller desalination plant, in the same locations as for Alternative 1. Therefore, all construction-related noise impacts would be the same as for Alternative 1, as discussed previously. Alternative 5b would result in the ***same impact conclusion*** as the proposed project, significant and unavoidable, even with mitigation.

Operational and Facility Siting Impacts

Alternative 5a would operate the same facilities in the same locations as the proposed project. A reduced number of subsurface slant wells would be installed, and the operational noise impact of the slant wells would be less than 5 dBA at the nearest receptors for both the project and Alternative 5a. Operation of the ASR-5 and ASR-6 Wells, and the booster stations at the Main System-Hidden Hills Interconnection could result in a significant impact. However, implementation of the **Mitigation Measure 4.12-5** (**Stationary Source Noise Controls**) would reduce operational noise impacts to less-than-significant level. Therefore, Alternative 5a would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Subsurface Slant Wells under Alternative 5b would operate closer to noise sensitive receptors (1,000 feet) than the proposed project (4,000 feet). Simultaneous operation of 5 well pumps would conservatively generate a noise level of approximately 63 dBA at 50 feet. At 1,000 feet, slant well pump noise would be reduced to 37 dBA, which is below ambient levels monitored along Potrero Road (54 dBA, L_{eq}) and would not contribute meaningfully to ambient noise levels. Operation of the ASR-5 and ASR-6 Wells, and the booster stations at the Main System-Hidden Hills Interconnection could result in a significant impact. However, implementation of the **Mitigation Measure 4.12-5** (**Stationary Source Noise Controls**) would reduce operational noise impacts to less-than-significant level.

Under Alternative 5b, the source water pipeline and subsurface Slant Wells would be installed in unincorporated Monterey County instead of the City of Marina. Policy S-7.6 of the County Plan Noise Element requires an acoustical analysis for proposed noise generators that produce a noise level exceeding 85 dBA at 50 feet from the source. Simultaneous operation of 5 well pumps would be consistent with Noise policies of the County Plan.

Consequently, Alternative 5b would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Cumulative Analysis

No additional cumulative projects would be within the geographic scope of the cumulative analysis for vibration impacts (within 120 feet of Alternative 2 components whose construction-related vibration could cause damage to structures); therefore, the analysis of cumulative vibration impacts would be the same as that described for the proposed project, with the exception that for Alternative 5a, less construction would occur near an historic structure (CEMEX building), and that for Alternative 5b, no construction would occur adjacent to this structure, so cumulative impacts from construction vibration would be reduced compared to the proposed project. The components of Alternative 5 that would result in operational noise are the same as for the proposed project; therefore, the analysis of cumulative noise impacts during operation is the same as described in Section 4.12.6; no additional projects – including the GWR Project (No. 59 in **Table 4.1-2** in Section 4.1) – would include operational noise-generating components that would be within the geographic scope for operational noise impacts.

The geographic scope of analysis for cumulative noise impacts during construction is defined by the presence of sensitive receptors within 500 feet of components whose daytime construction noise could exceed speech interference thresholds or whose nighttime construction noise could exceed sleep interference thresholds. These include the Source Water Pipeline and the Subsurface Slant Wells.

Two additional cumulative projects described in **Table 4.1-2** in Section 4.1 would have the potential to combine with Alternative 5 to result in cumulative noise impacts: the DeepWater Desal Project (No. 34) and the GWR Project. In the absence of detailed information regarding cumulative project construction equipment and exact construction phase timing, a quantitative assessment of cumulative nighttime noise impact cannot be reasonably estimated. However, it is conservatively assumed that the potential exists for residual (post-mitigation) construction noise to combine with that of the DeepWater Desal and GWR projects to cause nighttime noise levels to exceed the sleep interference threshold. As described in the FEIR for the GWR Project, construction activities associated with the injection well facilities of the GWR Project, which would be located within 500 feet of the southern end of the new Transmission Main, would result in significant and unavoidable nighttime noise impacts even with implementation of adopted mitigation measures (MRWPCA, 2016). As a result, temporary cumulative increases in nighttime construction noise could result in a cumulatively significant nighttime noise impact that would be increased compared to Alternative 5, the DeepWater Desal Project, or the GWR Project alone, and would remain significant and unavoidable even with mitigation specified for each project. No additional mitigation within the scope of this EIR/EIS is available to further reduce the potential for a cumulatively significant nighttime noise impact. Therefore, nighttime construction noise of Alternative 5a and 5b could have a significant contribution to a significant and unavoidable cumulative impact.

Overall, Alternatives 5a and 5b would result in a reduced severity but the ***same impact conclusion*** as the proposed project for cumulative effects related to noise, significant and unavoidable, even with mitigation.

5.5.12.9 References

Monterey Regional Water Pollution Control Agency (MRWPCA), 2016. *Consolidated Final Environmental Impact Report for the Pure Water Monterey Groundwater Replenishment Project.* Prepared by Denise Duffy and Associates, January 2016.

Siemens AG, 2005. Siemens Gas Turbines (SGT), SGT-500 Industrial Gas Turbine.

5.5.13 Public Services and Utilities

The evaluation criteria for Public Services and Utilities address: disruption or relocation of utilities; exceedance of wastewater treatment requirements; wastewater treatment and outfall capacity; landfill capacity and compliance with solid waste regulations; and corrosion of the existing MRWPCA outfall and diffuser.

5.5.13.1 Setting/Affected Environment

The general environmental setting and regulatory framework for the alternatives would be similar to the proposed project, which includes the public services, utilities, and local and state regulations that apply to Monterey County. As such, descriptions of the environmental setting and regulatory framework for public services and utilities are provided in Section 4.13 and are not repeated in this section.

5.5.13.2 Direct and Indirect Effects of Proposed Project (Slant Wells at CEMEX)

Impact 4.13-1: Disrupt or relocate regional or local utilities during construction.

Proposed project construction, including trenching, excavation, and pipeline installation, could damage or interfere with existing water, sewer, stormwater drainage, natural gas, electric, or communication utility service lines. Construction could require the permanent relocation of these utility lines, potentially interrupting service. Accidental damage to utility lines during construction could temporarily disrupt utility services and, in the case of high-risk utilities, could result in significant safety hazards for construction workers. This potentially significant impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.13-1a (Locate and Confirm Utility Lines)**, **4.13-1b (Coordinate Final Construction Plans with Affected Utilities)**, **4.13-1c (Safeguard Employees from Potential Accidents Related to Underground Utilities)**, **4.13-1d (Emergency Response Plan)**, **4.13-1e (Notify Local Fire Departments)**, and **4.13-1f (Ensure Prompt Reconnection of Utilities)**. These mitigation measures would require the construction contractor(s) to: confirm the location of existing utilities; work with utility service providers to minimize the risk of damage to existing utility lines and ensure prompt reconnection of service in the event of a service disruption; take special precautions when working near high-risk utility lines; clearly outline the procedures to follow in the event of a leak or explosion; and immediately notify local fire departments of any damage to high-risk utility lines. These mitigation measures would apply to all project components.

Impact 4.13-2: Exceed landfill capacity or be out of compliance with federal, state, and local statutes and regulations related to solid waste during construction.

Project construction would generate approximately 25,110 cubic yards total (37,665 tons), or up to 59 tons per day, of excess spoils and construction materials. Instead of being recycled, conservative analysis assumes that all excess spoils and construction debris would be disposed of at the Monterey Peninsula Landfill, which is permitted to receive 3,500 tons of waste per day and has an estimated remaining capacity of 48,560,000 cubic yards. The total amount of excess spoils and construction debris generated by the project represents approximately 0.05 percent of the landfill's remaining capacity. Therefore, project construction waste would not exceed or substantially deplete the landfill capacity.

Failure to reuse or recycle excavation materials and other construction waste generated during MPWSP construction would conflict with the County's Integrated Waste Management Plan policies and could also adversely affect state-mandated diversion rates. This significant impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.13-2** (**Construction Waste Reduction and Recycling Plan**). This measure would require CalAm's construction contractor(s) to prepare and implement a plan to divert recoverable materials from landfills. This mitigation measure would apply to all project components.

Impact 4.13-3: Exceed landfill capacity or be out of compliance with federal, state, and local statutes and regulations related to solid waste during operations.

MPWSP Desalination Plant operations would generate approximately 5 cubic yards per day (7.5 tons) of solid waste that would be routinely disposed of at the Monterey Peninsula Landfill. There are no known opportunities for reusing or recycling these solids, but the landfill could accept the waste without exceeding its permitted daily tonnage or substantially depleting long-term capacity. Maintenance of the ASR Pump-to-Waste System would generate approximately 240 pounds (less than 1 ton) per year of sediment materials that would be taken to the Waste Management District's materials recovery facility for reuse or recycling. All other proposed facilities would have a very limited potential to generate waste. Impacts related to solid waste disposal and landfill capacity during operations and maintenance would be less than significant.

Impact 4.13-4: Exceed wastewater treatment requirements of the Central Coast RWQCB, or result in a determination by the wastewater treatment provider that it has inadequate treatment or outfall capacity to serve the project.

Brine generated by the MPWSP Desalination Plant would be discharged to Monterey Bay in MBNMS through the MRWPCA's existing ocean outfall and diffuser. Depending upon the season, brine could be discharged without dilution for extended periods, since treated wastewater is used for irrigation in the dry season. The *Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant* [Order No. R3-2014-0013, NPDES Permit No. CA0048551], which regulate discharges from the outfall, would be amended before the MPWSP Desalination Plant starts operating to incorporate the "brine only" and combined discharges. Both the "brine only" and the combined discharges would comply with Ocean Plan water quality objectives for the majority of constituents. However, the concentrations of two constituents, cyanide and ammonia, could become elevated to a level that is close to or that exceeds the Ocean Plan standard (as discussed in Section 4.3.5.2, Operational and Facility Siting Impacts). Also, there is not enough information to assess concentrations for an additional thirteen individual constituents and, consequently, it is conservatively assumed that an exceedance of Ocean Plan water quality objectives could occur as a result of operational discharges. Exceedances of wastewater treatment requirements would be a significant impact. In addition to amending discharge requirements, **Mitigation Measures 4.3-4** (**Operational Discharge Monitoring, Analysis, Reporting, and Compliance**) and **Mitigation Measure 4.3-5**

(**Implement Protocols to Avoid Exceeding Water Quality Objectives**) are prescribed to monitor, report and reduce any water quality impacts associated with potential exceedances of the Ocean Plan water quality objective to a less-than-significant level.

Wastewater generated by 25 to 30 employees (approximately 750 gallons per day) at the MPWSP Desalination Plant would require treatment at the MRWPCA Regional Wastewater Treatment Plant. This volume would have a negligible impact on the MRWPCA treatment capacity of 29.6 mgd and discharge capacity of 81.2 mgd. None of the treatment processes at the MPWSP Desalination Plant site and none of the other proposed project facilities would generate wastewater during operations that would require treatment at the MRWPCA Regional Wastewater Treatment Plant. Therefore, project operations would not exceed wastewater treatment capacity and would have a less than significant impact on wastewater treatment capacity.

The MPWSP Desalination Plant would discharge approximately 14 mgd of brine through the MRWPCA outfall and diffuser, which have a physical discharge capacity of between 66.5 and 94.6 mgd and are permitted to discharge up to 81.2 mgd. Between 1998 and 2012, treated wastewater flows on average ranged from 19.78 mgd to 0.90 mgd, depending upon the irrigation season. Maximum instantaneous flows during the same time period ranged from 40.4 mgd to 59.9 mgd. Assuming full outfall capacity of 81.2 mgd, there would be sufficient capacity to accept the brine generated by the MPWSP Desalination Plant combined with maximum instantaneous flow. In case the volume of brine flows, plus maximum instantaneous wastewater flows during large storm events could exceed outfall and diffuser capacity, a 3-million-gallon brine storage basin has sufficient capacity to detain flows from approximately 6 hours of desalination plant operations. Therefore, the impact related to outfall capacity would be less than significant.

Impact 4.13-5: Increased corrosion of the MRWPCA outfall as a result of brine discharges associated with project operations.

Turbulence might be expected to occur in the land segment of the outfall, the junction drop structure at the shoreline, and approximately the first 100 feet of the offshore pipeline. This turbulence could introduce oxygen into the system and increase the potential for corrosion, which is considered a significant impact. As a project separate from the MPWSP, the beach junction box will be replaced and pre-lined with corrosion-resistant lining prior to accepting MPWSP brine discharge. The impacts on the land and ocean segments of the outfall would be reduced to a level that is less than significant with implementation of **Mitigation Measures 4.13-5a** (**Replacement of WEKO seal clamps, Periodic Inspections, and As-Needed Repairs for Offshore Segment of MRWPCA Ocean Outfall**), which requires the replacement of the existing WEKO seal clamps in the nearshore portion of the outfall pipeline with new corrosion-resistant clamps and periodic inspections of the outfall thereafter, and **4.13-5b** (**Install Protective Lining in Land Segment of MRWPCA Ocean Outfall**), which requires the phased application of a protective liner system along the entire 13,000-foot-long land segment.

Impact 4.13-C: Cumulative impacts related to public services and utilities.

Cumulative effects related to utility relocation or disruption and to landfill capacity during proposed project construction could be significant since all cumulative projects involving future construction would be applicable, but the proposed project's potentially significant contribution to this impact would be reduced to a less-than-significant level with implementation of mitigation measures identified in Impacts 4.13-1 and 4.13-2. Proposed project operations would have a less than significant contribution to cumulative landfill capacity impacts since operational wastes would have a relatively small effect on daily and absolute landfill receiving capacity. Cumulative effects on effluent flows that could exceed wastewater treatment requirements could be significant, but the proposed project's contribution to this impact would be reduced to a less-than-significant level with implementation of mitigation measures in Impact 4.13-4. Similarly, although cumulative impacts related to corrosion of the MRWPCA outfall could be significant, implementation of the mitigation measures identified in Impact 4.13-5 would reduce the proposed project's contribution to cumulative corrosion impacts to less than significant.

5.5.13.3 Direct and Indirect Effects of No Project Alternative

Under the No Project Alternative, no new facilities would be constructed and the existing test slant well would be decommissioned. Consequently, there would be no ground disturbance or placement of new structures that could affect public services or utilities, and therefore, no construction- or operation-related direct or indirect impacts on public services or utilities associated with the No Project Alternative. Because the No Project Alternative would have no direct or indirect impacts with respect to public services and utilities, it could not contribute to cumulative effects related to these topics.

5.5.13.4 Direct and Indirect Effects of Alternative 1 – Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.4.3). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**). Therefore, the utilities impact analysis of Alternative 1 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 1.

Construction Impacts

Construction of the additional 5.5 miles of source water pipeline in Alternative 1 could result in an increased potential for disruption or relocation of regional or local utilities compared to the proposed project. The potential significant impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.13-1a** (**Locate and Confirm Utility Lines**), **4.13-1b** (**Coordinate Final Construction Plans with Affected Utilities**), **4.13-1c** (**Safeguard Employees from Potential Accidents Related to Underground Utilities**), **4.13-1d** (**Emergency Response Plan**), **4.13-1e** (**Notify Local Fire Departments**), and **4.13-1f** (**Ensure**

Prompt Reconnection of Utilities). Therefore, combining the impacts of the components common with the proposed project and the addition of 5.5 miles of source water pipeline, Alternative 1 construction effects on regional or local utilities would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

The additional length of the Alternative 1 source water pipeline would generate slightly more solid waste during construction compared to the proposed project. However, the increased amount would not exceed landfill capacity. As discussed in Section 4.13.2, Regulatory Framework, state and county waste diversion regulations require that specific portions of construction waste be recycled and diverted from landfill. Failure to comply with waste diversion regulations would be a significant impact that would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.13-2** (**Construction Waste Reduction and Recycling Plan**). Therefore, combining the impacts of the components common with the proposed project with the additional 5.5 miles of source water pipeline, Alternative 1 construction effects on landfill capacity or solid waste regulations would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

No components unique to Alternative 1 would create waste during operations. All components that generate operational wastes would be the same as the proposed project. Therefore, Alternative 1 operational effects on landfill capacity or solid waste regulations would result in the ***same impact conclusion*** as the proposed project, less than significant.

Alternative 1 would use the same outfall and desalination plant as the proposed project; therefore, "brine only" and combined discharges would be the same as the proposed project, resulting in the same potentially significant impacts related to wastewater treatment requirements of the RWQCB as those under the proposed project. Implementation of **Mitigation Measures 4.3-4** (**Operational Discharge Monitoring, Analysis, Reporting, and Compliance**) and **4.3-5** (**Implement Protocols to Avoid Exceeding Water Quality Objectives**) would reduce impacts to a less-than-significant level. In addition, Alternative 1 would generate the same volume of brine, approximately 14 mgd, and the same amount of wastewater during operations as the proposed project, which would not exceed wastewater treatment and outfall capacity, resulting in a less-than-significant impact. Therefore, Alternative 1 operational effects on wastewater treatment requirements would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Brine in Alternative 1 would have the same salinity levels as the proposed project, resulting in the same potentially significant impact from increase in corrosion of the MRWPCA outfall . Implementation of **Mitigation Measures 4.13-5a** (**Replacement of WEKO seal clamps, Periodic Inspections, and As-Needed Repairs for Offshore Segment of MRWPCA Ocean Outfall**) and **4.13-5b** (**Install Protective Lining in Land Segment of MRWPCA Ocean Outfall**) would reduce significant impacts to a less-than-significant level. Therefore, Alternative 1 operation would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Cumulative Analysis

The geographic scope of analysis for cumulative impacts related to utilities for Alternative 1 is defined by the location of Alternative 1 components, and is the same as that described for the proposed project in Section 4.13.6, with exception of the different location of the subsurface intake system and alternative source water pipeline route. The cumulative scenario for Alternative 1 includes the projects in **Table 4.1-2** in Section 4.1 that have the potential to disrupt utilities during construction and generate waste during construction and operations. That would include the majority of the projects, including the DeepWater Desal project (No. 34). The RUWAP Recycled Water Project (No. 35) and the RUWAP Desalination Element (No. 31) are included since each has the potential to impact MRWPCA outfall capacity, outfall quality as it relates to corrosion of the outfall pipe, and wastewater treatment requirements. The impacts from construction and operation of Alternative 1 would be the same as those described for the proposed project, and have the potential to be significant. With implementation of mitigation measures described above, Alternative 1 would have a less than significant contribution to significant cumulative impacts. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to utilities, less than significant with mitigation.

5.5.13.5 Direct and Indirect Effects of Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**). Therefore, the utilities impact analysis of Alternative 2 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 2.

Construction Impacts

Construction of the additional 6.5 miles of source water pipeline in Alternative 2 could result in an increased potential for disruption or relocation of regional or local utilities compared to the proposed project. The potential significant impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.13-1a** (**Locate and Confirm Utility Lines**), **4.13-1b** (**Coordinate Final Construction Plans with Affected Utilities**), **4.13-1c** (**Safeguard Employees from Potential Accidents Related to Underground Utilities**), **4.13-1d** (**Emergency**

Response Plan), 4.13-1e (**Notify Local Fire Departments**), and **4.13-1f** (**Ensure Prompt Reconnection of Utilities**). Therefore, combining the impacts of the components common with the proposed project and the additional 6.5 miles of source water pipeline, Alternative 2 construction effects on regional or local utilities would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

The additional length of the Alternative 2 source water pipeline would generate slightly more solid waste during construction compared to the proposed project. However, the increased amount would not exceed landfill capacity. Since compliance with solid waste diversion rates are required by state and county regulation, failure to comply with such regulations would be a significant impact that would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.13-2** (**Construction Waste Reduction and Recycling Plan**). Therefore, combining the impacts of the components common with the proposed project with the additional 6.5 miles of the source water pipeline, Alternative 2 construction effects on landfill capacity or solid waste requirements would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

No components north of the Salinas River would create waste during operations. All components that generate operational wastes south of the Salinas River would be the same as the proposed project. Therefore, Alternative 2 operational effects on landfill capacity and solid waste requirements would result in the ***same impact conclusion*** as the proposed project, less than significant.

Alternative 2 would use the same outfall and desalination plant as the proposed project; therefore, it would have the same impact on wastewater treatment requirements and MRWPCA treatment and outfall capacity as Alternative 1 and the proposed project. The potentially significant impacts on wastewater treatment requirements of the RWQCB would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.3-4** (**Operational Discharge Monitoring, Analysis, Reporting, and Compliance**) and **4.3-5** (**Implement Protocols to Avoid Exceeding Water Quality Objectives**). Similar to the proposed project, impacts on treatment and outfall capacity would be less than significant. Therefore, Alternative 2 operational effects on wastewater treatment requirements would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Alternative 2 would result in the same potentially significant corrosive impact on the MRWPCA outfall and diffuser as Alternative 1 and the proposed project. Implementation of **Mitigation Measures 4.13-5a** (**Replacement of WEKO seal clamps, Periodic Inspections, and As-Needed Repairs for Offshore Segment of MRWPCA Ocean Outfall**) and **4.13-5b** (**Install Protective Lining in Land Segment of the MRWPCA Ocean Outfall**) would reduce the brine corrosion impact on the MRWPCA outfall lining and diffuser to less than significant. Therefore, Alternative 2 operations would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Cumulative Analysis

The geographic scope of analysis for cumulative utility impacts for Alternative 2 is defined by the location of the Alternative 2 components, and is the same as that described for the proposed project in Section 4.13.6, with exception that the Castroville Pipeline and Pipeline to CSIP are not included, as well as the different location of the open water intake system and alternative source water pipeline. The cumulative scenario for Alternative 2 includes the projects in **Table 4.1-2** in Section 4.1 that have the potential to disrupt utilities during construction and generate waste during construction and operations. That would include the majority of the projects, including the DeepWater Desal project (No. 34). The RUWAP Recycled Water Project (No. 35) and the RUWAP Desalination Element (No. 31) are included since each has the potential to impact MRWPCA outfall capacity, outfall quality as it relates to corrosion of the outfall pipe, and wastewater treatment requirements. The impacts from construction and operation of Alternative 2 would be the same as those described for the proposed project, and have the potential to be significant. With implementation of mitigation measures described above, Alternative 2 would have a less than significant contribution to significant cumulative impacts. Therefore, Alternative 2's contribution would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to utilities, less than significant with mitigation.

5.5.13.6 Direct and Indirect Effects of Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The pipelines for the intake and discharge systems would be installed using HDD. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-3**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**). Therefore, the utility impact analysis of Alternative 3 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 3.

Construction Impacts

Construction of Alternative 3 would result in an increased potential for disruption or relocation of regional or local utilities compared to the proposed project. The potential significant impact would be reduced to a less than significant level with implementation of **Mitigation Measures 4.13-1a** (**Locate and Confirm Utility Lines**), **4.13-1b** (**Coordinate Final Construction Plans with Affected Utilities**), **4.13-1c** (**Safeguard Employees from Potential Accidents Related to Underground Utilities**), **4.13-1d** (**Emergency Response Plan**), **4.13-1e** (**Notify Local Fire Departments**), and **4.13-1f** (**Ensure Prompt Reconnection of Utilities**). Therefore, combining the impacts of the components common with the proposed project and the additional components, construction effects on regional or local utilities would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

While the exact volume is unknown at this time, Alternative 3 would generate more construction solid waste than the proposed project due to the additional length of required pipelines, construction of intake and discharge conveyance, and larger construction footprint of the desalination plant, data center, and substation. However, the additional amount would be unlikely to cause landfill capacity to be exceeded. In addition, state and county waste diversion regulations require that specific portions of construction waste be recycled and diverted from landfill. Failure to comply with waste diversion regulations would be a significant impact that would be reduced to a less-than-significant level with implementation of proposed project **Mitigation Measure 4.13-2** (**Construction Waste Reduction and Recycling Plan**). Therefore, combining the impacts of the components common with the proposed project and those unique to Alternative 3, construction effects on landfill capacity or compliance with solid waste requirements would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

Operation of the Alternative 3 desalination plant would generate approximately 8.5 tons per day of dried sludge or cake, compared to the 7.5 tons for the MPWSP Desalination Plant. Maintenance of ASR Pump-to-Waste System, common with the proposed project, would generate approximately 240 pounds per year of operational waste. The additional cake volume from this alternative would not exceed landfill capacity or be out of compliance with federal, state, and local regulations related to solid waste during operations. Therefore, combining the impacts of the components common to the proposed project and the DeepWater desalination plant, Alternative 3 operational effects on landfill capacity or solid waste regulations would result in the ***same impact conclusion*** as the proposed project, less than significant.

Alternative 3 would not discharge brine to a wastewater treatment utility; therefore, brine discharges would have no impact on the MRWPCA's wastewater treatment requirements or outfall capacity. Employees would generate approximately 1,150 gpd of wastewater. Peak flows associated with the discharge of water from the closed-loop cooling system would be expected to occur less than a day per year and would be approximately 588,000 gallons per day. Such wastewater flows would be conveyed to the Castroville Sanitary District sanitary sewer system, which feeds into the MRWPCA wastewater treatment facility and would have a negligible impact on the MRWPCA discharge capacity of 81.2 mgd. Therefore, combining the impacts of the components common with the proposed project and those unique to Alternative 3, operational effects would result in a decreased level of impact on wastewater treatment requirements (no impact); an increased level of impact on wastewater treatment capacity (less than significant); and a decreased level of impact on outfall capacity (less than significant). Overall, Alternative 3 would result in a ***reduced impact conclusion*** as the proposed project, less than significant.

Alternative 3 would not discharge brine to the MRWPCA outfall; therefore, operational effects related to corrosion of the outfall would result in a ***reduced impact conclusion*** compared to the proposed project, no impact.

Cumulative Analysis

The geographic scope of analysis for cumulative utilities impacts for Alternative 3 is defined by the location of the Alternative 3 components. The cumulative scenario for Alternative 3 includes the projects in **Table 4.1-2** in Section 4.1 that have the potential to disrupt utilities during construction and generate waste during construction and operations. That would include the majority of the projects, including the GWR Project (No. 59). Unlike for the proposed project and Alternatives 1 and 2, the RUWAP projects would not be relevant to the operational cumulative scenario since they would not share a wastewater/brine discharge outfall with Alternative 3.

Impacts from construction of Alternative 3 would be similar to those described for the proposed project, and have the potential to be significant in light of the potentially significant cumulative impacts of multiple simultaneous projects on regional or local utilities and landfill capacity and solid waste regulations. However, with implementation of mitigation measures described above, the contributions of Alternative 3 to significant cumulative impacts would be reduced to a level that is less than significant because the potential for disruption of utilities would be reduced to the extent feasible and the likelihood of overlapping impacts would be minimized, and because Alternative 3 would comply with applicable solid waste regulations, reducing its construction and demolition waste to the extent feasible and required by such regulations. Impacts of Alternative 3 associated with operational wastes would be the same as the proposed project and would not have a significant contribution to a significant cumulative impact on landfill capacity or solid waste regulations. Operation of Alternative 3 would result in negligible impacts on a wastewater treatment utility due to wastewater volume, and would not contribute to cumulative impacts on wastewater treatment requirements or corrosion of the MRWPCA outfall and diffuser. Therefore, Alternative 3 would have the ***same impact conclusion*** as the proposed project for cumulative effects related to utilities, less than significant with mitigation.

5.5.13.7 Direct and Indirect Effects of Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and

ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**). Therefore, the utilities impact analysis of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4.

Construction Impacts

Construction of Alternative 4 could result in an increased potential for disruption or relocation of regional or local utilities compared to the proposed project associated with the additional desalinated water pipeline alignment. In particular, to rehabilitate the outfall/diffuser system at the caisson, service to the MLML, Phil's Fish Market, sea lion facilities, and MBARI could be disrupted since these entities draw seawater from two 8-inch intakes that are installed within the outfall/diffuser system. To ensure there would be no disruption in service to these customers during rehabilitation and to avoid a potentially significant impact, Alternative 4 would be required to implement **Mitigation Measures 4.13-1a** (**Locate and Confirm Utility Lines**), **4.13-1b** (**Coordinate Final Construction Plans with Affected Utilities**), **4.13-1c** (**Safeguard Employees from Potential Accidents Related to Underground Utilities**), **4.13-1d** (**Emergency Response Plan**), **4.13-1e** (**Notify Local Fire Departments**), and **4.13-1f** (**Ensure Prompt Reconnection of Utilities**). Therefore, combining the impacts of the components common with the proposed project and those unique to Alternative 4, construction effects on regional or local utilities would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Solid waste from construction of Alternative 4 would be approximately 93,250 cy, which is more than three times the volume for the proposed project. The proposed project conservatively assumes that all excess solid waste and construction debris would be disposed at the Monterey Peninsula Landfill, which has an estimated remaining capacity of 48,560,000 cubic yards. The total amount of excess solid waste and construction debris generated by the MPWSP represents approximately 0.06 percent of the landfill's remaining capacity, while disposal of the Alternative 4 solid waste would represent approximately 0.1 percent. In addition, state and county waste diversion regulations require that construction waste be recycled and diverted from landfill at specific levels. Failure to comply with waste diversion regulations would be a significant impact. Alternative 4 would result in an increased potential for a significant impact on landfill capacity during construction compared to the proposed project, if wastes are not diverted. Implementation of **Mitigation Measure 4.13-2** (**Construction Waste Reduction and Recycling Plan**) would reduce impact on landfill capacity to less than significant. Therefore, combining the impacts of the components common with the proposed project and those unique to Alternative 4, construction effects on landfill capacity or compliance with solid waste requirements would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

Operation of the Alternative 4 desalination plant would generate approximately 2 tons per day of cake, compared to 7.5 tons per day by the MPWSP Desalination Plant. Therefore, Alternative 4 would have a decreased level of impact on landfill capacity during operations compared to the proposed project. Combining the impacts of the components common to the proposed project and the Alternative 4 desalination plant, operational effects on landfill capacity and compliance with solid waste regulations would result in the ***same impact conclusion*** as the proposed project, less than significant.

Alternative 4 would not discharge brine to a wastewater treatment utility; therefore, brine discharges would have no impact on the MRWPCA's wastewater treatment requirements or outfall capacity. Operation of Alternative 4 would generate approximately 74,500 gpd of wastewater discharge to the Castroville Sanitary District sanitary sewer system, which feeds into the MRWPCA wastewater treatment facility. Such wastewater volumes would have a negligible impact on the MRWPCA discharge capacity of 81.2 mgd. Therefore, combining the impacts of the components common with the proposed project and those unique to Alternative 4, operational effects would result in a decreased level of impact on wastewater treatment requirements (no impact); an increased level of impact on wastewater treatment capacity (less than significant); and a decreased level of impact on outfall capacity (less than significant). Overall, Alternative 4 would result in a ***reduced impact conclusion*** compared to the proposed project, less than significant.

Alternative 4 would not discharge brine to the MRWPCA outfall; therefore, operational effects related to corrosion of the outfall would result in a ***reduced impact conclusion*** compared to the proposed project, no impact.

Cumulative Analysis

The geographic scope of analysis for cumulative utility impacts for Alternative 4 is defined by the location of the Alternative 4 components. The cumulative scenario for Alternative 4 includes the projects in **Table 4.1-2** in Section 4.1 that have the potential to disrupt utilities during construction and generate waste during construction and operations. That would include the majority of the projects, including the DeepWater Desal Project (No. 34). Unlike the proposed project and Alternatives 1 and 2, the RUWAP projects would not be relevant to the operational cumulative scenario since they would not share a wastewater/brine discharge outfall with Alternative 4. Unlike Alternative 3, the GWR Project (No. 59) is not relevant to the operational cumulative scenario for Alternative 4 because Alternative 4 would serve all of CalAm's Monterey District demand.

Impacts from construction of Alternative 4 would be similar to those described for the proposed project, and have the potential to be significant in light of the potentially significant cumulative impacts of multiple simultaneous projects on regional or local utilities and landfill capacity and solid waste regulations. However, with implementation of mitigation measures described above, the contributions of Alternative 4 to significant cumulative impacts would be reduced to a level that is less than significant because the potential for disruption of utilities would be reduced to the extent feasible and the likelihood of overlapping impacts would be minimized, and because

Alternative 4 would comply with applicable solid waste regulations, reducing its construction and demolition waste to the extent feasible and required by such regulations. Impacts of Alternative 4 associated with operational wastes would be similar to the proposed project and would have a less than significant contribution to a significant cumulative impact on landfill capacity or compliance with solid waste regulations. Operation of Alternative 4 would result in negligible impacts on a wastewater treatment utility due to wastewater volume, and would not contribute to cumulative impacts on wastewater treatment requirements or corrosion of the MRWPCA outfall and diffuser. Therefore, Alternative 4 would have the ***same impact conclusion*** as the proposed project for cumulative effects related to utilities, less than significant with mitigation.

5.5.13.8 Direct and Indirect Effects of Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction Impacts

Construction of Alternatives 5a and 5b would have the same potential for disruption or relocation of regional or local utilities as the proposed project. The potentially significant impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.13-1a** (**Locate and Confirm Utility Lines**), **4.13-1b** (**Coordinate Final Construction Plans with Affected Utilities**), **4.13-1c** (**Safeguard Employees from Potential Accidents Related to Underground Utilities**), **4.13-1d** (**Emergency Response Plan**), **4.13-1e** (**Notify Local Fire Departments**), and **4.13-1f** (**Ensure Prompt Reconnection of Utilities**). Therefore, construction of Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project regarding regional or local utilities, less than significant with mitigation.

Besides constructing fewer slant wells and a smaller capacity desalination plant, Alternative 5a would not result in changes to other proposed project components and would produce a similar volume of construction waste. Alternative 5b would result in a higher volume of construction waste due to the increased length of source water pipeline, but like Alternative 1, would not exceed landfill capacity. Therefore, Alternative 5a would have a similar level of impact on landfill capacity and Alternative 5b would have a slightly increased level of impact on landfill capacity compared to the proposed project. Failing to divert a substantial portion of construction waste could conflict with solid waste regulations, which would be a significant impact. Implementation of **Mitigation Measure 4.13-2** (**Construction Waste Reduction and Recycling Plan**) would reduce impacts related to landfill capacity and compliance with solid waste regulations to less than significant by ensuring that construction waste is reduced and recycled to the extent feasible in compliance with such regulations. Therefore, construction of Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project regarding landfill capacity and compliance with solid waste regulations, less than significant with mitigation.

Operational and Facility Siting Impacts

Alternatives 5a and 5b would operate the proposed MPWSP desalination plant and ASR Pump-to-Waste System, which are the only features expected to generate waste during operation. The volume of cake would be reduced under Alternatives 5a and 5b compared to the proposed project due to the reduced-capacity desalination plant. Therefore, operation of Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project regarding landfill capacity, less than significant.

Wastewater flows generated by the employees in Alternatives 5a and 5b would be the same as the proposed project. Alternatives 5a and 5b would operate a reduced-capacity desalination plant compared to the proposed project, which would produce reduced volumes of brine relative to the proposed project. Therefore, Alternatives 5a and 5b would have a decreased level of impact on the MRWPCA outfall capacity compared the proposed project. However, the same MRWPCA outfall would be used, and the "brine only" and combined discharges would be of the same quality as the proposed project. Therefore, Alternatives 5a and 5b would have the same level of impact related to wastewater treatment requirements as the proposed project. Potentially significant impacts related to exceedances of wastewater treatment requirements would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.3-4** (**Operational Discharge Monitoring, Analysis, Reporting, and Compliance**) and **4.3-5** (**Implement Protocols to Avoid Exceeding Water Quality Objectives**). Therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project regarding wastewater treatment requirements, less than significant with mitigation.

Because Alternatives 5a would draw water from the same location as the proposed project and since Alternative 5b would draw water from an aquifer that contains salt water (same location as Alternative 1), brine generated by Alternatives 5a and 5b would result in the same or similar salinity levels as the proposed project. Like the proposed project and Alternative 1, Alternatives 5a and 5b would utilize the MRWPCA outfall and diffuser. Therefore, Alternatives 5a and 5b would have the same level of impact as the proposed project, resulting in potentially significant impacts on the outfall lining and diffuser, which would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.13-5a** (**Replacement of WEKO seal clamps, Periodic Inspections, and As-Needed Repairs for Offshore Segment of MRWPCA Ocean Outfall**) and **4.13-5b** (**Install Protective Lining in Land Segment of MRWPCA Ocean Outfall**). Therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project regarding corrosion of the MRWPCA outfall, less than significant with mitigation.

Cumulative Analysis

Combined Impacts with GWR Project

The GWR Project would produce approximately 35,000 cubic yards (11,700 tons) of excess construction and demolition waste, or about 30 tons per day (MRWPCA, 2016). If construction were to overlap, combined with the 59 tons per day from Alternative 5a or 5b, the approximately 90 tons per day of waste would not exceed or substantially deplete the landfill capacity, and the combined projects would have the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

During operations, the GWR Project could produce up to 800 lbs/day (less than 1 ton per day) of solid wet waste requiring disposal in a landfill. However, as stated above, the volume of solid waste generated by Alternative 5a or 5b would be reduced compared to the proposed project, balancing out this increase in the combined scenario with the GWR Project. Therefore, the combined operational wastes would result in the ***same impact conclusion*** as the proposed project regarding landfill capacity, less than significant.

Impacts on wastewater treatment requirements from the operational brine stream in Alternatives 5a and 5b would be the same as the proposed project. The addition of GWR Project effluent (analyzed in Section 5.5.3.8) would reduce the volume of treated effluent that would be available to combine with brine flows, but the combined discharges would be of the same quality as analyzed under the proposed project and may result in a significant impact with respect to both wastewater treatment requirements and corrosion of the MRWPCA outfall. With implementation of **Mitigation Measures 4.3-4**, **4.3-5**, **4.13-5a**, and **4.13-5b**, impacts would be reduced to less than significant. Combined impacts on outfall capacity would be less than significant. Therefore, Alternatives 5a and 5b in combination with the GWR Project would result in the ***same impact conclusion*** as the proposed project regarding wastewater treatment requirements and corrosion of the MRWPCA outfall, less than significant with mitigation.

Impacts of Full Cumulative Scenario

The geographic scope of analysis for cumulative utility impacts for Alternatives 5a and 5b is the same as that for the proposed project and Alternative 1. The cumulative scenario for Alternatives 5a and 5b includes the projects in **Table 4.1-2** in Section 4.1 that have the potential to disrupt utilities during construction and generate waste during construction and operations. That would include the majority of the projects, including the DeepWater Desal project (No. 34) and the GWR Project. The RUWAP Recycled Water Project (No. 35) and the RUWAP Desalination Element (No. 31) are included since each has the potential to impact MRWPCA outfall capacity, outfall quality as it relates to corrosion of the outfall pipe, and wastewater treatment requirements.

Cumulative impacts from construction of Alternatives 5a and 5b would be similar to those described for the proposed project, which has the potential to result in significant impacts regarding regional and local utilities and landfill capacity. With implementation of mitigation measures described above, Alternatives 5a and 5b would have a less than significant contribution to significant cumulative impacts for the same reasons described for the proposed project in Section 4.13.6.

Impacts from operation of Alternatives 5a and 5b related to landfill capacity and compliance with solid waste regulations would be the same as those described for the proposed project and, with mitigation, would have a less than significant contribution to significant cumulative impacts on landfill capacity.

Because Alternatives 5a and 5b would have a reduced desalination plant capacity, they would have a reduced impact on MRWPCA outfall capacity compared to the proposed project. Combined with the effects of the RUWAP Recycled Water Element and the GWR Project, the impact on MRWPCA outfall capacity would be reduced compared to the cumulative scenario for the proposed project due to the increased volume of wastewater effluent that would be recycled instead of discharged through the outfall. Therefore, no significant cumulative impact on outfall capacity would occur. Cumulative impacts from the brine's potential to corrode the MRWPCA outfall in Alternatives 5a and 5b would be the same as described for the proposed project, and with implementation of mitigation measures described above, Alternatives 5a and 5b would have a less than significant contribution to significant cumulative impacts. Overall, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to utilities, less than significant with mitigation.

5.5.13.9 References

Monterey Regional Water Pollution Control Agency (MRWPCA), 2016. *Consolidated Final Environmental Impact Report for the Pure Water Monterey Groundwater Replenishment Project.* Prepared by Denise Duffy and Associates, January 2016.

5.5.14 Aesthetic Resources

The evaluation criteria for Aesthetics address: construction-related impacts on scenic resources or the visual character of the project area and surroundings, temporary sources of light or glare during construction, permanent impacts on scenic resources or the visual character of the project area and surroundings, and permanent sources of light or glare.

5.5.14.1 Setting/Affected Environment

The components of the alternatives that are common to the proposed project are located south of the Nashua Road/Highway 1 intersection and the setting/affected environment for those facilities is described in Section 4.14.2, Setting/Affected Environment. The setting for the components north of the Nashua Road/Highway 1 intersection is presented below.

Pipeline Alignments North of Nashua Road/Highway 1 Intersection

North and west of the Nashua Road/Highway 1 intersection, pipeline alignments for all Alternatives could extend within or alongside segments of Molera Road, Highway 1, Potrero Road, and Dolan Road, in unincorporated Monterey County. These alignments occur within the Agricultural and Urban and Built-up landscape units (see Section 4.14.2 for definitions of these units). There are no designated scenic corridors in the vicinity of these pipeline alignments.

The aesthetic character of the areas south of Moro Cojo Slough is predominantly agricultural, defined by two-lane roads bisecting mostly flat agricultural lands where row crops extend towards the horizon. In the vicinity of Moro Cojo slough, the aesthetic character is more scenic, defined by open views of the broad meandering slough channel, undeveloped grass- and marshlands extending out from the channel edge, and mature vegetation and mixed development visible in the distance. Within Moss Landing, the aesthetic character is defined by Moss Landing Harbor and the industrial Moss Landing Green Commercial Park and Moss Landing Power Plant, views of which are partially obscured by vegetated berms, mature vegetation, and opaque fencing. East of Moss Landing, along Dolan Road, the aesthetic character returns to one that is predominantly agricultural, defined by expanses of undeveloped grasslands and row crops, interspersed with residential and light industrial developments.

Sources of nighttime lighting and glare include residential developments near the Potrero Road/Highway 1 intersection, commercial and industrial development near the Dolan Road/Highway 1 intersection, commercial and institutional developments within Moss Landing Harbor, and headlights from vehicles traveling along area roads. Owing to intensive and largely inharmonious mix of land uses in the vicinity of the alignments, while also considering the broader natural context (e.g., Elkhorn Slough and the Pacific Coast), the visual quality is considered moderate. Given the existing land use patterns and highly modified landforms, the public's expectation for aesthetically pleasing views in the alignment area is limited; the visual sensitivity is, therefore, also considered moderate. Views of the alignments are generally limited to viewers in motion, such as motorists and cyclists traveling along area roads or the California Coastal Trail, and would be fleetingly visible. The landscape exposure is, therefore, considered low. For these reasons, the aesthetic resource value of the alignment area is considered moderate.

Potrero Road Parking Lot

The Potrero Road parking lot, which is the site of slant well construction in Alternative 1, is located approximately 0.4 mile west of Highway 1, within the Beaches and Coastal Dunes landscape unit. The aesthetic character of the Potrero Road parking lot is defined by the Old Salinas River channel and fringing marshes to the east and croplands beyond, and the gently rolling scrub-covered coastal dunes to the west. The nearest potential sources of nighttime lighting and glare are the homes along Laguna Place, approximately 0.25 mile to the east. Given its proximity to a vast expanse of mostly undeveloped coastal dunes and wetlands, and with consideration for its location within a state park, the site is considered to have high visual quality and high visual sensitivity. At the same time, views of the parking area are generally limited to park visitors approaching or within the parking lot. It is not visible from Highway 1 or the beach. Therefore, the site's landscape exposure is considered low. For these reasons, the aesthetic resource value is considered moderate.

Moss Landing Beach

The stretch of Moss Landing Beach in the vicinity of the Alternative 4 intake system, is located on the west side of Moss Landing's southern peninsula, approximately 250 feet west of Sandholdt Road, within the Beaches and Coastal Dunes landscape unit. The aesthetic character is defined by the narrow band of white sand beach, vegetated dunes, and Pacific Ocean to the west and south. The inland extent of the beach is flanked by revetment rock and a seawall; as well as various institutional, commercial, and marine-related industrial developments beyond. Given the types and extents of development along the beach, the aesthetic quality is considered moderate. The visual sensitivity is moderate because visitors to the area are likely drawn by and have expectations for scenic coastal views. However, views of the beach are limited to those on or immediately adjacent to the beach; it is not plainly visible from Highway 1 or other area roads. As such, the landscape exposure is low. For these reasons, the aesthetic resource value is considered moderate. Sources of nighttime lighting and glare include development fronting Sandholdt Road, along the back of the beach.

Moss Landing Green Commercial Park

The Moss Landing Green Commercial Park is located east of and adjacent to Highway 1, and south of Dolan Road and the Moss Landing Power Plant, within the Urban and Built-up landscape unit. Former home to the National Refractories & Minerals Corporation's magnesium production plant, the 200-acre site is highly degraded, characterized by a landscape denuded of all vegetation, and including a tank farm and various industrial warehouse buildings. Views of the site are generally limited to those from Highway 1 and Dolan Road, and are obscured by a vegetated earthen berm, mature vegetation, and opaque fencing. Given the site's industrial legacy and the public's lack of expectation for scenic resources, the site is considered to have a low visual quality and sensitivity. Similarly, given that views into the site are obscured by topography and vegetation, the landscape exposure is also low. For these reasons, the aesthetic resource value is considered low. Sources of nighttime lighting and glare include developments within Moss Landing and the Moss Landing Power Plant.

East Tank Farm Parcel

The East Tank Farm Parcel is located north of and adjacent to Dolan Road, approximately 2 miles east of Highway 1, within the Agricultural landscape unit. The aesthetic character of the site is defined by the large tracts of mostly-flat grasslands, coastal scrub, and marsh and slough, interspersed with various residential, agricultural, and industrial developments. Given its openness and relatively undeveloped character, while accounting for the varied types of developments existent, the site is considered to have a moderate visual quality. The public would have little expectation for scenic views in this area and so the visual sensitivity is considered low. Similarly, public views of the site are limited to those from motorists or cyclists traveling along Dolan Road, and so would be fleeting. While over 8,000 feet away, elements of the project may be visible from various vantage points within the Elkhorn Slough channel. Thus, the visual exposure is considered low. For these reasons, the aesthetic resource value of the East Tank Farm Parcel is considered low. Sources of nighttime light and glare in the site's vicinity are few and generally include distant developments and headlights from vehicles traveling along Dolan Road.

5.5.14.2 Direct and Indirect Effects of Proposed Project (Slant Wells at CEMEX)

The proposed project extends from Castroville in the north to the city of Carmel in the south (see **Figure 3-2)** and would include construction of a desalination plant on 25 acres along Charles Benson Road northeast of the City of Marina, up to nine new subsurface slant wells at the CEMEX active mining area, two new wells (ASR-5 and ASR-6) at the existing Seaside Groundwater Basin ASR system, the Carmel Valley Pump Station, and about 21 miles of water conveyance pipelines. The direct and indirect impacts of the proposed project are described in detail in Section 4.7.5.

Impact 4.14-1: Construction-related impacts on scenic resources (vistas, roadways, and designated scenic areas) or the visual character of the project area and its surroundings.

Construction equipment and machinery, spoils stockpiles, vegetation removal, and exposed earth associated with the implementation of many project components would be temporarily visible to motorists, bicyclists, pedestrians, and other observers such as nearby residents and park visitors. Some of these construction activities would be visible from Highways 1, 68, and 156, which are eligible for designation or officially designated as State Scenic Highways. These construction activities could disrupt the visual character of the surrounding areas. However, due to the temporary nature of these construction effects, and because work areas would be restored to their approximate pre-construction condition upon completion of construction, such impacts would be less than significant. Although mitigation is not required to reduce a significant impact under CEQA, this EIR/EIS recommends implementation of **Mitigation Measure 4.14-1 (Maintain Clean and Orderly Construction Sites)**.

Impact 4.14-2: Temporary sources of substantial light or glare during construction,

Project construction activities have the potential to introduce temporary sources of substantial light into the project area. This impact would be significant but mitigable for the subsurface slant wells and the ASR-5 and ASR-6 Wells, as well as for the Source Water Pipeline, Brine Discharge

Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, new Desalinated Water Pipeline, new Transmission Main, and their corresponding optional alignments. Implementation of **Mitigation Measure 4.14-2** (**Site-Specific Nighttime Lighting Measures**), which requires site-specific construction lighting controls, would reduce the potential impacts of nighttime construction lighting to a less-than-significant level. No impacts related to nighttime lighting would result from construction of the ASR pipelines, Carmel Valley Pump Station, Ryan Ranch- Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

Impact 4.14-3: Permanent impacts on scenic resources (vistas, roadways, and designated scenic areas) or the visual character of the project area and its surroundings.

Permanent aboveground facilities proposed for the MPWSP could have an adverse impact on scenic resources or the existing visual character of facility sites within the project area. This impact would be significant but mitigable for the subsurface slant wells, ASR-5 and ASR-6 wells. This impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.14-3a** (**Facility Design**) and **4.14-3b** (**Facility Screening**), which require that CalAm design the facilities to avoid or minimize contrast with the surrounding setting and ensure the facilities are screened from public views to the extent feasible. Although mitigation is not required for the MPWSP Desalination Plant, or the Carmel Valley Pump Station, this EIR/EIS recommends implementation of **Mitigation Measures 4.14-3a** and **4.14-3b** for all above-ground project components to further reduce potential aesthetic resources effects and facilitate compatibility of project design with the natural and built environment. No operational impacts related to scenic resources and visual character would result from below-ground facilities, including proposed pipelines and optional alignments.

Impact 4.14-4: Permanent new sources of light or glare.

Project operations would introduce permanent sources of substantial light into the project area. This impact would be significant but mitigable for the ASR injection/extraction wells, and the Carmel Valley Pump Station. Implementation of **Mitigation Measure 4.14-2** (**Site-Specific Nighttime Lighting Measures**), which requires site-specific lighting controls, would reduce the potential impacts of nighttime operations lighting to a less-than-significant level. Although such mitigation is not required for the MPWSP Desalination Plant this EIR/EIS recommends implementation of **Mitigation Measure 4.14-2** (**Site-Specific Nighttime Lighting Measures**) for all above-ground project components with permanent sources of nighttime lighting to further reduce potential light spillover and dark night skies impacts. No operational impacts related to nighttime lighting would result from below-ground facilities, including proposed pipelines and optional alignments.

Impact 4.14-C: Cumulative impacts related to aesthetic resources.

Effects of the proposed project in scenic areas could overlap with those of Fort Ord Dunes State Park Campground Project (No. 46) and the Castroville Bicycle and Pedestrian Overcrossing Project (No. 36). The overall duration of the visual disturbance would be temporary, limited to the construction phases of these projects. Effects of the proposed project nighttime construction lighting could overlap with those of the RUWAP Recycled Water Project (No. 35) and possibly the city of Monterey Sanitary Sewer System Rehabilitation Program (No. 51). However, the combined effects would not exceed the established thresholds of significance. There are no projects in the cumulative scenario whose effects would combine with those of the proposed project to cause a significant cumulative impact. However, following implementation of **Mitigation Measure 4.14-2** (**Site-Specific Nighttime Lighting Measures**), the proposed project would have a less-than-significant impact related to nighttime construction lighting, and its contribution to any cumulative impacts would be reduced to a level that is less than significant because this measure would ensure that nighttime lighting has minimal spillover from active construction sites. Therefore, the overall cumulative impact would be less than significant, with mitigation.

5.5.14.3 Direct and Indirect Effects of No Project Alternative

Under the No Project Alternative, no new facilities would be constructed or operated. However, decommissioning of the test slant well could result in potentially significant but mitigable impacts on aesthetic resources, including nighttime lighting. See Impact 4.14-2 in Section 4.14.6.1. Slant well decommissioning could adversely affect nighttime views of this mostly undeveloped stretch of coastline from the viewpoint of Highway 1 motorists and coastal Marina residents. If slant well decommissioning involves nighttime lighting, implementation of Mitigation Measure 4.14-2 would reduce impacts to a less-than-significant level. There would be no other construction- or operations-related effects on aesthetics associated with the No Project Alternative. Because the No Project Alternative would have a less than significant impact with respect to aesthetics, cumulative effects related to this topic would be less than significant.

5.5.14.4 Direct and Indirect Effects of Alternative 1 – Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (Potrero Road). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**).

Construction Impacts

Scenic Resources and Visual Character

Construction equipment and machinery, spoils stockpiles, vegetation removal, and exposed earth associated with the implementation of components common to the proposed project would temporarily disrupt the visual character of the surrounding areas and would be visible to motorists, bicyclists, pedestrians, and other observers such as nearby residents and park visitors. However, because work areas would be restored to their approximate pre-construction condition upon completion of construction, such impacts would be less than significant. Although mitigation is not required to reduce a significant impact under CEQA, this EIR/EIS recommends implementation of **Mitigation Measure 4.14-1** (**Maintain Clean and Orderly Construction Sites**).

The Alternative 1 Source Water Pipeline would be longer compared to the proposed project, and would be constructed mainly in an area considered to have a low aesthetic resource value. The subsurface slant wells at Potrero Road would be constructed in an area of moderate aesthetic resource value. The construction-period disturbance would be temporary and generally be limited in visibility to residents using Potrero Road to access their homes. Such impacts would be for very short durations, as most viewers would be in motion, either traveling along area roads or walking in the vicinity of the Potrero Road parking lot. The visual impact severity would be low.

Impacts associated with the additional length of pipeline installation would be visible over a larger area, but would not have an increased effect on scenic resources. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Nighttime Lighting and Glare

The additional 5.5 miles of Alternative 1 Source Water Pipeline and the subsurface slant wells at Potrero Road could require nighttime construction, which would temporarily introduce new substantial sources of nighttime light into otherwise dark and near-roadway areas. Such lighting could substantially change the lighting environment and present a nuisance or hazard to area motorists. In addition, construction activities associated with the components common to the proposed project would have the potential to introduce temporary sources of substantial light into the project area. This impact would be significant for the ASR-5 and ASR-6 Wells, as well as for the Source Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, new Desalinated Water Pipeline, new Transmission Main, and their corresponding optional alignments. Implementation of **Mitigation Measure 4.14-2** (**Site-Specific Nighttime Lighting Measures**) would reduce the potential impacts of nighttime construction lighting to a less-than-significant level.

Alternative 1 construction would not involve reflective materials that could cause substantial glare impacts. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

Scenic Resources and Visual Character

The subsurface slant wells for Alternative 1would be located in an area identified as having moderate aesthetic resource value. While the wells would be buried below ground surface, an electrical control building for the wells would be constructed at the edge of the parking lot. The structure would measure approximately 12 feet long, 4 feet wide and 6 feet tall. As there are few other structures in the vicinity of the parking lot, the well control structure could contrast with other landscape elements. However, the structure would be subordinate in size relative to the adjacent dunes, which rise some 20 feet above the parking lot, and would not be visible from the beach or otherwise block coastal views. As such, the visual impact severity would be low. Permanent aboveground facilities common with the proposed project could have an adverse impact on scenic resources or the existing visual character of facility sites within the project area. This impact would be significant for the subsurface slant wells, ASR-5 and ASR-6 wells, and this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.14-3a** (**Facility Design**) and **4.14-3b** (**Facility Screening**).

Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Nighttime Lighting and Glare

Project operations would introduce permanent sources of substantial light into the project area. This impact would be significant for the ASR injection/extraction wells, and the Carmel Valley Pump Station. Implementation of **Mitigation Measure 4.14-2** (**Site-Specific Nighttime Lighting Measures**) would reduce the potential impacts of nighttime operations lighting to a less-than-significant level. The Alternative 1 subsurface slant wells control structure would not require nighttime lighting and no additional operational impacts related to nighttime lighting and glare would result.

Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Cumulative Analysis

The geographic scope of analysis for cumulative impacts related to aesthetics for Alternative 1 is defined by the locations from which a viewer could see the Alternative 1 construction or operations effects, and is the same as that described for the proposed project in Section 4.2.6, with the exception of the different location of the subsurface intake system (Potrero Road, instead of CEMEX) and alternative source water pipeline route. Cumulative impacts resulting from the components of Alternative 1 that are common with the proposed project would be the same as those described for the proposed project in Section 4.14.7. Beyond those identified and addressed under Section 4.14.7, there are no additional cumulative projects whose effects could combine with those of Alternative 1 to result in impacts different from those described for the proposed project. For the reasons described in Section 4.14.7, the cumulative effects of the projects in the cumulative scenario could be significant, but the potentially considerable contribution of Alternative 1 would be reduced to a level that is less than significant with implementation of **Mitigation Measure 4.14-2**. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

5.5.14.5 Direct and Indirect Effects of Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a new, screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station on Dolan Road (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission

Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to Castroville Community Services District would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**). Therefore, the impact analysis of Alternative 2 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 2.

Construction Impacts

Scenic Resources and Visual Character

Construction equipment and machinery, spoils stockpiles, vegetation removal, and exposed earth associated with the implementation of components common to the proposed project would temporarily disrupt the visual character of the surrounding areas and would be visible to motorists, bicyclists, pedestrians, and other observers such as nearby residents and park visitors. However, because work areas would be restored to their approximate pre-construction condition upon completion of construction, such impacts would be less than significant. Although mitigation is not required to reduce a significant impact under CEQA, this EIR/EIS recommends implementation of **Mitigation Measure 4.14-1** (**Maintain Clean and Orderly Construction Sites**).

The Alternative 2 Source Water Pipeline would be constructed within an area generally considered to have low aesthetic resource value. The intake pump station would be constructed within an existing industrial area generally considered to have a low aesthetic resource value. Barges used for installation of the intake structure would be visible offshore (approximately 1,300 feet). The construction-period disturbance would be temporary for all facilities. Pipeline construction would be fleetingly visible, as most viewers would be in motion, traveling along area roads. Views of the intake pump station construction would be mostly obscured by topography and mature vegetation. The barges would be visible in the distance, but would not impair coastal views. The visual impact severity would be low. The effect on scenic resources and visual character would, therefore, be less than significant.

Impacts associated with the additional length of pipeline installation would be visible over a larger area, but would not have an increased effect on scenic resources compared to the proposed project. Effects of the intake pump station would be similar – involving similar types of activities and occurring within areas of similar aesthetic character. Therefore, Alternative 2 would result in a ***same impact conclusion*** as the proposed project, less than significant.

Nighttime Lighting and Glare

The longer Source Water Pipeline and intake pump station could require nighttime construction. Barges used for intake structure installation and moored offshore could also require nighttime safety lighting. These components of Alternative 2 would temporarily introduce new substantial sources of nighttime light into otherwise dark and near-roadway areas. Such lighting could substantially change the lighting environment and present a nuisance or hazard to area motorists. Alternative 2 construction activities would not involve reflective materials that could cause substantial glare impacts. In addition, construction activities associated with the components common to the proposed project would have the potential to introduce temporary sources of substantial light into the project area. This impact would be significant for the ASR-5 and ASR-6 Wells, as well as for the Source Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, new Desalinated Water Pipeline, new Transmission Main, and their corresponding optional alignments. Implementation of **Mitigation Measure 4.14-2** (**Site-Specific Nighttime Lighting Measures**) would reduce the potential impacts of nighttime construction lighting to a less-than-significant level. Therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

Scenic Resources and Visual Character

The intake pump station would be the only above-ground facility unique to Alternative 2. The facility would be constructed within an existing industrial area generally considered to have a low aesthetic resource value. The facility would be in keeping with the industrial character of the site, and public views of the intake pump station site would be limited to those from Dolan Road, where the majority of potential viewers would be in vehicles traveling past the site and focused on the road. For these reasons, the visual impact severity would be low and the effect would be less than significant.

The overall effects of Alternative 2 would be reduced compared to the proposed project. There would be fewer above-ground facilities visible within scenic areas (i.e., no wellhead vaults visible at the CEMEX property). The intake pump station may be visible from Dolan Road, but would not further degrade the industrial aesthetic character of the setting. Alternative 2 permanent above-ground facilities common to the proposed project would result in potentially significant impacts on scenic resources and visual quality. However, implementation of **Mitigation Measures 4.14-3** (**Facility Design**) and **4.14-b** (**Facility Screening**) would reduce the impact to less than significant. Therefore, Alternative 2 would have the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Nighttime Lighting and Glare

The intake pump station would be the only above-ground facility unique to Alternative 2 and may require nighttime operations or security lighting. The facility would be sited in an industrial area with existing nighttime lighting and partially screened from Dolan Road. However, new sources of unconfined nighttime lighting in proximity to the road could present a nuisance or hazard to motorists which would be significant. The nighttime lighting effects of Alternative 2 permanent above-ground facilities common to the proposed project would be significant. However, impacts would be reduced to a less than significant level with implementation of **Mitigation Measure 4.12-2** (**Site-Specific Nighttime Lighting Measures**).

The effects of Alternative 2 would be similar to those of the proposed project. Nighttime lighting at the intake pump station site would result in a localized increase in nighttime lighting. Alternative 2 facilities would not utilize large amounts of highly reflective materials that could cause substantial glare impacts. Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Cumulative Analysis

The geographic scope of analysis for cumulative impacts related to aesthetics for Alternative 2 is defined by the locations from which a viewer could see the Alternative 2 construction or operations effects, and is the same as that described for the proposed project in Section 4.2.6, with the exception of the different location of the seawater intake system Moss Landing) and alternative source water pipeline route. Cumulative impacts resulting from the components of Alternative 2 that are common with the proposed project would be the same as those described for the proposed project in Section 4.14.7. Beyond those identified and addressed under Section 4.14.7, there are two additional reasonably foreseeable future cumulative projects that could overlap in time and space with Alternative 2: the Moss Landing Community Plan (No. 37 in **Table 4.1-2** in Section 4.1) and the DeepWater Desal Project (No. 34). Adoption of the Moss Landing Community Plan could include the enactment of new policies regarding protection of aesthetic resources in the Community Plan area. However, the Community Plan would not authorize development that could have physical aesthetic resources impacts that could combine with those of Alternative 2.

As analyzed above, the Alternative 2 intake pump station and alternative source water pipeline would have a less-than-significant construction impacts with mitigation. The DeepWater Desal Project would include development of similar facilities to those in Alternative 2 in similar or the same locations. The effects would be similar to those described for Alternative 2 components; i.e., increased visual disturbances and nighttime lighting during construction. The effects would generally be confined to the north side of Dolan Road, in the vicinity of the Moss Landing Power Plant, but would also occur offshore in association with the intake/outfall structure barges. It is assumed that nighttime lighting associated with DeepWater Desal Project construction would be controlled to limit spill-over and light pollution. If the projects were constructed sequentially, the duration of effects could be extended. However, given that the landside site is highly industrial, and that the landside and offshore effects would be localized and temporary, the combined effects of these projects would not exceed the established thresholds of significance. If lighting associated with construction of the DeepWater Desal Project were not controlled to limit spill-over, it could result in a significant impact that could combine with the potentially significant impact of Alternative 2 to cause a significant cumulative impact; however, with implementation of **Mitigation Measure 4.14-2**, Alternative 2 would have a less than significant contribution to a significant cumulative effect.

Operation of the DeepWater Desal Project would include an intake pump station in a location similar to or the same as that described for Alternative 2. The effects would be similar to those described for Alternative 2 components: additional industrial-looking development adjacent to an existing industrial site, with increased nighttime security lighting. Colocation of the Alternative 2 and DeepWater Desal Project facilities adjacent to the Moss Landing Power Plant site could increase the area of the effect, but would not increase its severity. This is because the site is already highly industrial and contains existing sources of nighttime lighting. For these reasons, the combined effects would not exceed the established thresholds of significance, and the cumulative impact would not be significant. While it is assumed that nighttime lighting associated with the DeepWater Desal Project operations would be controlled to limit spill-over and light pollution, if not controlled, it could result in a significant impact that could combine with the potentially significant impact of Alternative 2 to cause a significant cumulative impact; however, with implementation of **Mitigation Measure 4.14-2**, Alternative 2 would have a less than significant contribution to a significant cumulative effect related to nighttime lighting during operations. Therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

5.5.14.6 Direct and Indirect Effects of Project Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open-water intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The pipelines for the intake and discharge systems would be installed using HDD. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-3**, ASR 5 and 6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**). Therefore, the impact analysis of Alternative 3 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 3.

Construction Impacts

Scenic Resources and Visual Character

The segment of the Alternative 3 Desalinated Water Pipeline north of the Nashua Road/Highway 1 intersection and the Source Water Pipeline would be constructed mainly in alignment areas generally considered to have low aesthetic resource value. The intake pump station would also be constructed within an existing industrial area generally considered to have a low aesthetic resource value. Barges used for the intake structure installation would be visible offshore (approximately 1,300 feet). The construction-period disturbance would be temporary for each facility. Pipeline construction would be fleetingly visible, as most viewers would be in motion, traveling along area roads. Views of the intake pump station construction would be mostly obscured by topography and mature vegetation. The barges would be visible in the distance, but would not impair coastal views. The visual impact severity would be low. The effect on scenic resources and visual character would, therefore, be less than significant. Although mitigation is not required to reduce a significant impact, this EIR/EIS recommends implementation of **Mitigation Measure 4.14-1** (**Maintain Clean and Orderly Construction Sites**).

The East Tank Farm Parcel – on which the Alternative 3 desalination plant, data center and ancillary equipment would be constructed – is generally considered to have low aesthetic resource value. Construction activities would not be substantially out of character with the setting or appear dominant on the landscape; various industrial and intensive agricultural operations exist nearby. Nor would these activities impair public views of valued aesthetic resources; the site is not visible from any designated scenic areas or roadways. Views of the site from public vantage points are largely obscured by intervening topography and vegetation. While over 8,000 feet away, elements of the project may be visible from various vantage points within the Elkhorn Slough channel. The views would not be out of character with the existing industrial land uses and the zoning in the area. For these reasons, the visual impact severity would be low. The effect on scenic resources and visual character would, therefore, be less than significant.

Impacts associated with the additional length of desalinated water pipeline installation would be visible over a larger area, but would not have a substantial increased effect on scenic resources compared to the proposed project. Therefore, Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Nighttime Lighting and Glare

The Desalinated Water Pipeline north of the Nashua Road/Highway 1 intersection, the Source Water Pipeline, and the intake pump station could require nighttime construction. Barges used for the intake and outfall installations moored offshore could also require nighttime lighting. These elements of Alternative 3 would temporarily introduce new substantial sources of nighttime light into otherwise dark and near-roadway areas. Such lighting could substantially change the lighting environment and present a nuisance or hazard to area motorists.

Alternative 3 facilities at the East Tank Farm Parcel could also require nighttime construction. Such activities would introduce a new substantial source of temporary lighting into an area that is generally dark, with existing sources of lighting distant and limited to residential and industrial security and safety lighting, and the headlights of vehicles traveling along Dolan Road and Via Tanques Road. The site is partially screened from view by intervening topography and vegetation, but other areas are plainly visible from Dolan Road. The nearest residence is approximately 400 feet to the southwest. Such temporary nighttime lighting increases could present a nuisance and hazard to area residents and motorists, respectively.

Nighttime lighting impacts of the proposed project subsurface slant well installation in the vicinity of the CEMEX site would be eliminated, while nighttime lighting effects from barges used for Alternative 3 intake and discharge structure installation would be increased. Lighting effects from pipeline installation north of Nashua Road/Highway 1 intersection, intake pump station installation, and East Tank Farm Parcel work would be similarly increased. In addition, construction activities associated with the components common to the proposed project would have the potential to introduce temporary sources of substantial light into the project area. This impact would be significant for the ASR-5 and ASR-6 Wells, as well as for the Source Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, new Desalinated Water Pipeline, new Transmission Main, and their corresponding optional alignments. Implementation of **Mitigation Measure 4.14-2** (**Site-Specific Nighttime Lighting Measures**) would reduce the potential impacts of nighttime construction lighting to a less-than-significant level. Alternative 3 construction activities would not involve reflective materials that could cause substantial glare impacts. Therefore, Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

Scenic Resources and Visual Character

The Alternative 3 intake pump station would be located within an existing industrial area generally considered to have a low aesthetic resource value. The facility would be in keeping with the industrial character of the site, and public views of the intake pump station site would be limited to those from Dolan Road, where the majority of viewers would be in vehicles traveling past the site and focused on the road. For these reasons, the visual impact severity would be low and the effect would be less than significant.

The East Tank Farm Parcel is generally considered to have low aesthetic resource value. Siting and operation of the Alternative 3 desalination plant, data center and ancillary equipment facilities would not be completely out of character with the setting, as various industrial and intensive agricultural land uses exist nearby. Nor would these facilities impair public views of valued aesthetic resources; the site is not visible from any designated scenic areas or roadways. Given the low density of development in the site’s vicinity and the scale and height of existing development, the Alternative 3 facilities proposed for the East Tank Farm Parcel could appear dominant on the landscape. However, views of the site from public vantage points are largely obscured by intervening topography and vegetation. While over 8,000 feet away, elements of the project may be visible from various vantage points within the Elkhorn Slough channel. The views would not be out of character with the existing industrial land uses and the zoning in the area. For these reasons, the visual impact severity would be low. The effect on scenic resources and visual character would, therefore, be less than significant.

Alternative 3 would have fewer above-ground facilities visible within scenic areas (i.e., no wellhead vaults visible at the CEMEX property). Effects of facilities at the East Tank Farm Parcel would be similar to those of the proposed project location of the desalination plant – occurring in proximity to other industrial land uses and ultimately partially screened from public view by trees and fencing. The effects of Alternative 3 permanent above-ground facilities common to the proposed project would be the same as described in Impact 4.14-3, and Alternative 3 would result in a significant impact. Implementation of **Mitigation Measures 4.14-3** (**Facility Design**) and **4.14-b** (**Facility Screening**) would reduce impacts to less than significant.

Overall, Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Nighttime Lighting and Glare

The Alternative 3 intake pump station may require nighttime operations or security lighting. The facility would be sited in an industrial area with existing nighttime lighting and partially screened from Dolan Road. However, new sources of unconfined nighttime lighting in proximity to the road could present a nuisance or hazard to motorists, which would be significant.

Alternative 3 facilities at the East Tank Farm Parcel would include outdoor nighttime lighting for access and security. Such activities would introduce a new substantial source of temporary lighting into an area that is generally dark, with existing sources of lighting distant and limited to residential and industrial security and safety lighting, and the headlights of vehicles traveling along Dolan Road and Via Tanques Road. The site is partially screened from view by intervening topography and vegetation, but other areas are plainly visible from Dolan Road. The nearest residence is approximately 400 feet to the southwest. Such nighttime lighting increases could present a nuisance and hazard to area residents and motorists, respectively. Alternative 3 facilities would not utilize large amounts of highly reflective materials that could cause substantial glare impacts.

The nighttime lighting effects of Alternative 3 permanent above-ground facilities, including those common to the proposed project, would result in significant impacts. Implementation of **Mitigation Measure 4.12-2** (**Site-Specific Nighttime Lighting Measures**) would reduce nighttime lighting and glare impacts to less than significant.

Therefore, Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Cumulative Analysis

The geographic scope of analysis for cumulative impacts related to aesthetics for Alternative 3 is defined by the locations from which a viewer could see the Alternative 3 construction or operations effects. Cumulative impacts resulting from the components of Alternative 3 that are common with the proposed project would be the same as those described for the proposed project in Section 4.14.7. Beyond those identified and addressed under Section 4.14.7, one additional reasonably foreseeable future cumulative project that could overlap in time and space with the components of Alternative 3 that differ from the proposed project: the Moss Landing Community Plan (No. 37 in **Table 4.1-2** in Section 4.1). Adoption of the Moss Landing Community Plan could include the enactment of new policies regarding protection of aesthetic resources in the Community Plan area. However, the Community Plan would not authorize development that could have physical aesthetic resources impacts that could combine with those of Alternative 3. Therefore, because no other projects would contribute to cumulative aesthetic resources impacts in combination with Alternative 3, the cumulative impacts associated with the components of Alternative 3 that differ from the proposed project would be as described for Alternative 3 alone. Therefore, overall, Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

5.5.14.7 Direct and Indirect Effects of Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**). Therefore, the impact analysis of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4.

Construction Impacts

Scenic Resources and Visual Character

The segment of Alternative 4 Desalinated Water Pipeline north of the Nashua Road/Highway 1 intersection would be constructed mainly within areas generally considered to have low aesthetic resource value. The construction-period disturbance would be temporary and only fleetingly visible, as most viewers would be in motion, traveling along area roads. The visual impact severity would be low. The effect on scenic resources and visual character would, therefore, be less than significant.

The Sandholdt Road pump house structure would be constructed in an area of moderate aesthetic resource value. Construction activity would be visible from Sandholdt Road and the Moss Landing Beach. Given its proximity to the coast and public use areas (e.g., Salinas River State Beach), the construction area could substantially degrade the visual character of the beach if not properly contained and maintained. However, with implementation of feasible mitigation, such as that identified in **Mitigation Measure 4.14-1** (**Maintain Clean and Orderly Construction Sites**) the effect would be reduced to a less-than-significant level.

The Moss Landing Green Commercial Park – on which the Alternative 4 desalination plant would be constructed – is generally considered to have low aesthetic resource value. Construction activities would not be out of character with the setting or appear dominant on the landscape; intensive industrial operations exist at the site and nearby. Nor would these activities impair public views of valued aesthetic resources; the site is not visible from any designated scenic areas or roadways. Views of the site from public vantage points are generally obscured by intervening topography and vegetation. For these reasons, the visual impact severity would be low. The effect on scenic resources and visual character of the Alternative 4 desalination plant construction would, therefore, be less than significant.

Impacts associated with the additional length of pipeline installation would be visible over a larger area, but would not have an increased effect on scenic resources. The effects of Alternative 4 construction, including components common to the proposed project, would be t significant, but would be reduced to less than significant with **Mitigation Measure 4.14-1** (**Maintain Clean and Orderly Construction Sites**). Therefore, Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Nighttime Lighting and Glare

The segment of the new Desalinated Water Pipeline north of the Nashua Road/Highway 1 intersection and the Sandholdt Road pump house structure could require nighttime construction, which would temporarily introduce new substantial sources of nighttime light into otherwise dark and near-roadway areas. Alternative 4 construction activities would not involve reflective materials that could cause substantial glare impacts. Barges used for intake and discharge structure installation and be moored offshore and could also require nighttime safety lighting. These elements of Alternative 4 could substantially change the lighting environment and present a nuisance or hazard to area motorists.

If the Alternative 4 desalination facility at the Moss Landing Green Commercial Park required nighttime construction, a new substantial source of temporary lighting would be introduced into the area. Existing sources of lighting in the area are numerous and include outdoor safety and security lighting in the Moss Landing Power Plant, commercial developments along Highway 1, and developments within Moss Landing Harbor. Public views of the site are limited to those from Highway 1 and are mostly screened from view by intervening topography and vegetation. The nearest residence is approximately 1,800 feet (0.34 mile) to the southwest. As a result, any nighttime lighting impacts on area motorists and area residents would be negligible. The temporary lighting impacts associated with nighttime construction at the Moss Landing Green Commercial site would be less than significant.

The effects of Alternative 4 construction lighting, including components common to the proposed project, would result in significant impacts, but would be reduced to less than significant with implementation of **Mitigation Measure 4.12-2** (**Site-Specific Nighttime Lighting Measures**).

Therefore, Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

Scenic Resources and Visual Character

The Moss Landing Green Commercial Park is generally considered to have low aesthetic resource value. Siting and operation of the Alternative 4 desalination plant and ancillary equipment facilities would not be out of character with the setting, as the site is an intensive industrial area. The site is not visible from any designated scenic areas or roadways. Highway 1 is eligible for designation as a scenic highway. However, views to the site from Highway 1 are mostly screened from view by intervening topography and mature vegetation. Due to this screening, the desalination plant and appurtenant facilities would not appear dominant on the landscape, nor would they obstruct public views of valued aesthetic features. For these reasons, the visual impact severity would be low. The effect on scenic resources and visual character would, therefore, be less than significant.

The Sandholdt Road pump house structure would be located near an existing developed area generally considered to be of moderate aesthetic resource value. However, given its location along the beach and seaward of the existing line of development, the facility would contrast and change and contrast with the visual character of existing features along Sandholdt Road and the Salinas River Beach. Rising to a height of approximately 27 feet, the facility would be a dominant feature among surrounding existing heights of other features. Due to its height, the structure could also impede, but would not be expected to impair, important public views of the coast. For these reasons, the pump house would have a significant visual impact. These effects of Alternative 4 permanent above-ground facilities, and those common to the proposed project, would be significant. Implementation of **Mitigation Measures 4.14-3a** (**Facility Design**) and **4.14-3b** (**Facility Screening**) would reduce impacts to less than significant.

Therefore, Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Nighttime Lighting and Glare

Alternative 4 facilities would not utilize large amounts of highly reflective materials that could cause substantial glare impacts. The desalination plant and associated facilities at the Moss Landing Green Commercial Park would likely include outdoor security and access lighting. These fixtures would introduce additional sources of nighttime lighting into a highly industrialized area with multiple sources of existing nighttime lighting. As noted previously, views of the site are obscured by existing topography and vegetation and the nearest residence is more than 1/3 mile away. As a result, nighttime lighting impacts on area motorists and area residents would be negligible. The temporary lighting impacts associated with nighttime security and access lighting at the Moss Landing Green Commercial site would be less than significant.

Nighttime outdoor security lighting may be required for the Sandholdt Road pump house structure. The installation of such fixtures could introduce substantial sources of nighttime light into an otherwise mostly dark area along the beach, and at an elevation at or above that of nearby structures. These nighttime lighting effects of Alternative 4 permanent above-ground facilities, and of those common to the proposed project, would result in significant impacts. Implementation of **Mitigation Measure 4.12-2** (**Site-Specific Nighttime Lighting Measures**) would reduce impacts to less than significant. Therefore, Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Cumulative Analysis

The geographic scope of analysis for cumulative impacts related to aesthetics for Alternative 4 is defined by the locations from which a viewer could see the Alternative 4 construction or operations effects. Cumulative impacts resulting from the components of Alternative 4 that are common with the proposed project would be the same as those described for the proposed project in Section 4.14.7. Beyond those identified and addressed under Section 4.14.7, there are two additional reasonably foreseeable future cumulative projects that could overlap in time and space with Alternative 4: the Moss Landing Community Plan (No. 37 in **Table 4.1-2** in Section 4.1) and the DeepWater Desal Project (No. 34). Adoption of the Moss Landing Community Plan could include the enactment of new policies regarding protection of aesthetic resources in the Community Plan area. However, the Community Plan would not authorize development that could have physical aesthetic resources impacts that could combine with those of Alternative 4.

As analyzed above, the Alternative 4 new Desalinated Water Pipeline and Alternative Source Water Pipeline would have significant construction impacts. Visual impacts of the Alternative 4 desalination plant construction would be less than significant, as they would be mostly shielded from public view by intervening topography and vegetation. Construction of the DeepWater Desal Project would include development of an intake pump station, pipelines, and a desalination plant and associated facilities along the north side of Dolan Road. Concurrent or sequential construction of these project elements would increase or prolong visual disturbance and nighttime lighting impacts in Moss Landing. However, the combined effects of the two projects would not be substantial, because these facilities would not occur in a scenic area, nor would they be plainly visible from the same public vantage point. Intake/outfall construction would increase the number of barges and associated nighttime lighting offshore, but would be distant from the shore and in the same general vicinity. Given that the landside setting is highly industrial, and the landside and offshore effects would be localized and temporary, the combined effects of these projects would not exceed the established thresholds of significance. If lighting associated with construction of the DeepWater Desal Project were not controlled to limit spill-over, it could result in a significant impact that could combine with the potentially significant impact of Alternative 4 to cause a significant cumulative impact; however, with implementation of **Mitigation Measure 4.14-2**, Alternative 4 would have a less than significant contribution to a significant cumulative effect.

As analyzed above, the desalination plant and appurtenant facilities at the Moss Landing Green Commercial Park would have a less-than-significant effect because the site is mostly screened from outside public view. Operation of the DeepWater Desal Project's intake pump station would be partially visible from Dolan Road and would introduce a new source of nighttime lighting into the area. However, for the same reasons described for cumulative construction-period effects, the combined effects of project operations would not be substantial. While it is assumed that nighttime lighting associated with the DeepWater Desal Project operations would be controlled to limit spill-over and light pollution, if not controlled, it could result in a significant impact. However, given that the setting is highly industrial and the effects would be localized and largely screened from public view, the combined effects of these projects would not exceed the established thresholds of significance. With implementation of **Mitigation Measure 4.14-2**, Alternative 4 would have a less than significant contribution to a significant cumulative effect related to nighttime lighting during operations. Therefore, Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

5.5.14.8 Direct and Indirect Effects of Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction Impacts

Scenic Resources and Visual Character

The visual effects of Alternative 5a and 5b construction would be the same as described for the proposed project and Alternative 1, respectively. For the reasons discussed for the proposed project and Alternative 1, Alternatives 5a and 5b would result in the ***same impact conclusions*** as the proposed project, less than significant.

Nighttime Lighting and Glare

The visual effects of Alternative 5a and 5b construction lighting would be the same as described for the proposed project and Alternative 1, respectively. Implementation of **Mitigation Measure 4.12-2** (**Site-Specific Nighttime Lighting Measures**) would reduce impacts to less than significant. Alternatives 5a and 5b would result in a ***similar level of impact*** compared to the proposed project and impacts would be less than significant with mitigation.

Operational and Facility Siting Impacts

Scenic Resources and Visual Character

The effects of Alternative 5a and 5b permanent above-ground facilities would be the same as described for the proposed project and Alternative 1, respectively, and would be significant but mitigable to a less-than-significant level with implementation of **Mitigation Measures 4.14-3a** (**Facility Design**) and **4.14-3b** (**Facility Screening**). Alternatives 5a and 5b would result in the ***same impact conclusions*** as the proposed project, less than significant with mitigation.

Nighttime Lighting and Glare

The nighttime lighting effects of Alternative 5a and 5b permanent above-ground facilities would be the same as described for the proposed project and Alternative 1, respectively, and would be significant but mitigable to a less-than-significant level with implementation of **Mitigation Measure 4.12-2** (**Site-Specific Nighttime Lighting Measures**). Alternatives 5a and 5b would result in a ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Cumulative Analysis

Combined Impacts with GWR Project

Construction Impacts

The construction-period effects of Alternative 5 on scenic resources and visual character would be less than significant. Segments of the Alternative 5 New Desalinated Water Pipeline and New Transmission Main would follow an alignment similar to the GWR Project's Product Water Conveyance Coastal Alignment Pipeline. Concurrent pipeline construction could affect the same viewsheds, including scenic areas along the west side of Highway 1, a State-eligible Scenic Highway. As pipeline installation impacts would be limited to the construction period, and with construction expected to progress at a rate of 150 to 250 feet per day, the aesthetic resources effects from any particular vantage point would generally be limited to a few days to a few weeks. The combined effects would not substantially affect scenic resources or the visual character of the area. Therefore, concurrent construction would not substantially affect scenic resources or the visual character of the area, and would not combine to result in a significant cumulative effect.

The nighttime construction lighting effects of Alternative 5 would be less than significant with implementation of mitigation. GWR Project components that could require nighttime construction lighting near Alternative 5 components also potentially requiring nighttime construction lighting include the treatment plant facilities and the injection well clusters. The Alternative 5 Pipeline to CSIP Pond construction could occur at the same time and in proximity to the GWR treatment plant facilities. The effects would occur in a remote location, adjacent to existing industrial development (MRWPCA Regional Treatment Plant), with no nearby residential development. Nighttime construction lighting associated with the Alternative 5 ASR Pipelines and GWR injection wells would be visible from residences on the west side of General Jim Moore Boulevard. Considering their distance and the intervening topography, the residual effects of nighttime lighting from both projects following mitigation would not be visible from any single residence. For these reasons, concurrent nighttime construction of Alternative 5 and the GWR Project would not substantially affect the nighttime lighting environment, and therefore would not combine to result in a significant cumulative impact. Therefore, combined with the GWR Project, Alternative 5 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operations and Facility Siting Impacts

The operations and facility siting effects of Alternative 5 on scenic resources and visual character and nighttime lighting would be less than significant with mitigation. GWR Project above-ground components that would be located near Alternative 5 above-ground components include the treatment plant facilities and the injection well cluster. The Alternative 5 Desalination Plant would be sited approximately 3,000 feet north of the GWR Project's treatment plant facilities. Both facilities would include nighttime security lighting resulting in individual potentially significant impacts that would be reduced to a less-than-significant level with mitigation. Considering their distance and the intervening topography and vegetation, none of these facilities would be plainly visible from the site of another, nor would multiple facilities be plainly visible from the same public vantage point. Therefore, the residual effects of these facilities following mitigation would not substantially affect the area's scenic resources, visual character, or lighting environment, and cumulative impacts would not be significant. Therefore, combined with the GWR Project, Alternative 5 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Impacts of Full Cumulative Scenario

The geographic scope of analysis for potential cumulative aesthetic resources impacts encompasses the locations from which a viewer could see the Alternative 5a and 5b construction or operations effects, and would be the same as described for the proposed project and Alternative 1, respectively. Beyond those identified and addressed under Section 4.14.7, there is only one additional reasonably foreseeable future cumulative project that could overlap in time and space with Alternative 5, the GWR Project. As described above, the addition of the GWR Project to the cumulative scenario would not change the magnitude of or significance conclusions for aesthetic resources. Therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

5.5.15 Cultural and Paleontological Resources

The evaluation criteria for Cultural and Paleontological Resources address: historical resources or historic properties during construction; archeological resources during construction; paleontological resources or sites, or geologic features during construction; and, human remains during construction. The facilities located at the CEMEX site overlap with recorded historical resources.

5.5.15.1 Setting/Affected Environment

The components of the alternatives that are common to the proposed project are located south of the Nashua Road/Highway 1 intersection and the setting/affected environment for those facilities is described in in Section 4.15, Cultural and Paleontological Resources. The setting for the components north of the Nashua Road/Highway 1 intersection is presented below. Site specific information for Alternative 4 components (People's Project) was not available.

Pipeline Alignments North of Nashua Road/Highway 1 Intersection

North and west of the Nashua Road/Highway 1 intersection, alternative pipeline alignments could extend within or alongside segments of Molera Road, Highway 1, Potrero Road, and Dolan Road, in unincorporated Monterey County. ESA conducted a records search at the Northwest Information Center (NWIC) for components north of the Nashua Road/Highway 1 intersection on February 28, 2013 (File No. 12-0934) and May 31, 2016 (File No. 15-1766) in order to: (1) determine whether known cultural resources have been recorded within the alternative locations; (2) assess the likelihood for unrecorded cultural resources to be present based on historical references and the distribution of nearby resources; and (3) develop a context for the identification and preliminary evaluation of cultural resources. As discussed below, several previously recorded prehistoric archaeological sites and historic-era artifact scatters are in the vicinity of the alternative alignments, especially near Moss Landing.

Potrero Road Parking Lot

Based on the results of the ESA records search at the NWIC, there are no recorded cultural resources in the Potrero Road Parking Lot. Previously recorded prehistoric resources are recorded within a 0.25-mile radius of the parking lot. ESA surveyed the parking lot in December 2014 and did not identify any cultural materials or evidence of past human use.

Moss Landing Beach and Monterey Bay

Based on the results of the ESA records search at the NWIC, there are no recorded cultural resources on Moss Landing Beach. Previously recorded prehistoric resources are recorded within a 0.25-mile radius of the parking lot.

Deep Water Desal, LLC contracted with William Self Associates, Inc. (WSA) to review existing literature on the maritime history and archaeology of the offshore locations of Moss Landing in MBNMS (WSA, 2016). WSA reviewed the California State Lands Commission (CSLC) Shipwreck database, and contacted the Monterey Maritime Museum and Monterey Bay National Marine Sanctuary for information housed in those repositories to determine the likelihood that submerged marine resources are present. WSA also contacted the Bureau of Ocean Energy Management (BOEM) to consult the Bureau's Pacific Coastal Cultural Resources Database to determine if there are recorded submerged cultural resources in the Moss Landing area. The BOEM database identified 15 potential shipwrecks within the region surrounding the locations of the proposed intake and discharge points, but the exact locations of the vessels have not been determined.

Moss Landing Green Commercial Park

Based on the results of the ESA records search at the NWIC, there are no cultural resources recorded in the Moss Landing Green Commercial Park, in part because it has not been surveyed. Several previously recorded cultural resources are within a 0.25-mile radius. Site specific information for the Moss Landing Green Commercial Park was not made available.

East Tank Farm Parcel

WSA conducted a records search and surface survey of the East Tank Farm Parcel. The results of the surface survey indicate sites extend into the DeepWater Desal Project area (WSA, 2016). Two additional prehistoric archaeological sites and three historic-era artifact scatters are also within a 0.25-mile radius of Moss Landing.

5.5.15.2 Direct and Indirect Effects of Proposed Project (Slant Wells at CEMEX)

The proposed project extends from Castroville in the north to the city of Carmel in the south (see **Figure 3-2**) and would include construction of a desalination plant on 25 acres along Charles Benson Road northeast of the City of Marina, up to nine new subsurface slant wells at the CEMEX active mining area and conversion of the test well to a permanent well, two new wells (ASR-5 and ASR-6) at the existing Seaside Groundwater Basin aquifer storage and recovery (ASR) system, the Carmel Valley Pump Station, and about 21 miles of water conveyance pipelines. The direct and indirect impacts of the proposed project are described in detail in Section 4.7.5.

Impact 4.15-1: Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 of the CEQA Guidelines or historic properties pursuant to 36 CFR 800.5 during construction.

No historical resources listed in or eligible for listing in the California Register, or historic properties listed in or eligible for listing in the National Register, are within the direct or indirect APE of all project components. Therefore, no impact on historical resources or historic properties would result from construction of any project facilities.

Impact 4.15-2: Cause a substantial adverse change in the significance of an archeological resource pursuant to Section 15064.5 of the CEQA Guidelines during construction.

A significant impact on archaeological resources could occur during construction of the proposed Castroville Pipeline at Tembladero Slough and the Source Water Pipeline in the Lapis Sand Mining Plant Historic District; as well as those areas designated as archaeologically sensitive in the geoarchaeological analysis (Tembladero Slough near Castroville and the Salinas River). The impact or adverse effects would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.15-2a** (**Establish Archaeologically Sensitive Area**).

While no additional impacts or adverse effects on archaeological resources are expected, the possibility of uncovering unknown archaeological resources in the remaining direct APE cannot be entirely discounted. The potential inadvertent discovery of archaeological resources could be a significant impact or adverse effect. Implementation of **Measure 4.15-2b** (**Inadvertent Discovery of Cultural Resources**) would ensure that potential impacts are less than significant.

Impact 4.15-3: Directly or indirectly destroy a unique paleontological resource or site, or unique geologic feature during construction.

Construction of the proposed project components would require excavation through three geologic units that have the potential to contain paleontological resources, particularly vertebrate fossils. Of these three geologic units, only the Monterey Formation is known to contain vertebrate fossils that would qualify as a unique paleontological resource. However, because construction would occur in a limited area of the Monterey Formation and within previously-disturbed rights-of way of existing roads, potential impacts on unique paleontological resources would be less than significant.

Impact 4.15-4: Disturbance of any human remains, including those interred outside of formal cemeteries, during construction.

While no known human remains have been documented within the proposed project direct APE, the possibility of inadvertently uncovering human remains cannot be entirely discounted. The potential inadvertent discovery of human remains is considered a significant impact. The impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.15-4** (**Inadvertent Discovery of Human Remain**s).

Impact 4.15-C: Cumulative impacts related to cultural and paleontological resources.

The geographic scope of analysis for cumulative impacts on cultural resources includes the direct and indirect Area of Potential Effects for the proposed project. The geographic scope of analysis for paleontological resources includes the portion of the aforementioned underlain by the Monterey Formation geologic unit. Applicable projects from **Table 4.1-1** are those that involve ground disturbance or could cause vibratory impacts on historic buildings or structures. Overall, the MPWSP would not contribute to cumulative impacts associated with Impacts 4.15-1 through 4.15-4.

5.5.15.3 Direct and Indirect Effects of No Project Alternative A

Under the No Project Alternative, no new facilities would be constructed or operated and the existing test slant well would be decommissioned. Consequently, there would be no construction- or operations-related impacts on cultural or paleontological resources with the No Project Alternative. Because the No Project Alternative would have no direct or indirect impacts with respect to cultural or paleontological resources, it could not contribute to cumulative effects related to these topics.

5.5.15.4 Direct and Indirect Effects of Alternative 1 – Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.4.3). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvement, and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**).

Construction Impacts

No historical resources listed in or eligible for listing in the California Register, or historic properties listed in or eligible for listing in the National Register, are within the direct or indirect APE of any project components. Therefore, Alternative 1 would result in the same impact and the ***same impact conclusion*** on historical resources or historic properties compared to the proposed project; no impact would result from construction of any project facilities.

Construction of the Alternative 1 Source Water Pipeline along Potrero Road would be adjacent to two previously recorded large prehistoric archaeological sites. The results of a pedestrian survey in December 2014 were inconclusive as to whether these sites extend into the alignment. One additional prehistoric archaeological site and two historic-era artifact scatters are also within a 0.25-mile radius of Alternative 1 components north of the Nashua Road/ Highway 1 intersection. But the potential impacts at CEMEX would be avoided, therefore, the potential for impacts on undiscovered archaeological resources would be the same compared to the proposed project, and the applicant would need to implement **Mitigation Measure ALT 1-CULT** (**Conduct Subsurface Investigation**) and **Mitigation Measure 4.15-2a** (**Establish Archaeologically Sensitive Area**) to reduce the impact to less than significant.

Mitigation Measure ALT 1-CULT applies to the Alternatives 1, 2, 3, 4, and 5b components that differ from the proposed project and would not apply to the proposed project or Alternative 5a.

Mitigation Measure ALT 1-CULT (Conduct Subsurface Investigation)

The applicant shall contract a professional archeologist to conduct a subsurface investigation to disclose whether nearby archaeological sites overlap with the project alignment.

If archaeological resources are found to extend into the Alternative 1 Source Water Pipeline alignment, the applicant would conduct a data recovery investigation or other appropriate measures in accordance with **Mitigation Measure 4.15-2a** (**Establish Archaeologically Sensitive Area**), which includes provisions for an Archaeological Research Design and Treatment Plan in the event a significant archaeological resources cannot be avoided. Implementation of these mitigation measures would reduce the potentially significant impact on archaeological resources and Alternative 1 would result in the ***same impact conclusion*** compared to the proposed project, less than significant with mitigation.

Of the geologic units through which Alternative 1 would require excavation, Older Dune Sands and Terrace Deposits may have the potential for paleontological resources. The University of California Museum of Paleontology (UCMP) database search indicated a few microfossils have been identified from these younger geologic units but none near the location of Alternative 1. Therefore, the potential impact on paleontological resources would be the same as the proposed project and would result in the ***same impact conclusion***, less than significant.

While no known human remains have been documented within the Alternative 1 APE, the possibility of inadvertently uncovering human remains cannot be entirely dismissed. Implementation of **Mitigation Measure 4.15-4** (**Inadvertent Discovery of Human Remains**) would ensure that if human remains are uncovered during project construction the Most Likely Descendant of the deceased Native American is contacted and the remains are treated per the recommendations of the Coroner, reducing impacts to less than significant. Alternative 1 would result in the same impact and the ***same impact conclusion*** compared to the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

Impacts on cultural and paleontological resources, if any, would only occur during ground disturbing activity. There would be no operational and facility siting impacts on cultural and paleontological resources and Alternative 1 would have the ***same impact conclusion*** as the proposed project, no impact.

Cumulative Analysis

The geographic scope of analysis for potential cumulative cultural resources impacts encompasses locations where ground disturbing activity would occur under Alternative 1. In addition to the projects relevant to the cumulative scenario for the proposed project, the DeepWater Desal Project (No. 34 in **Table 4.1-2** in Section 4.1) would be located in close proximity to Alternative 1 ground disturbance. This analysis assumes that all of the cumulative projects have a similar potential impact on cultural and paleontological resources. However, because each project's potential impacts would be site-specific to individual components, they would not combine with those of Alternative 1. Therefore, there would be no significant cumulative impact and Alternative 1 would have a less than significant contribution to cumulative impacts on cultural and paleontological resources. Alternative 1 would have the ***same impact conclusion*** as the proposed project, less than significant.

5.5.15.5 Direct and Indirect Effects of Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a new, screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station on Dolan Road (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the

Proposed Project. Because the open water intake would eliminate the need for returning source water originated from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to Castroville Community Services District would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**). Therefore, the impact analysis of Alternative 2 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 2.

Construction Impacts

No historical resources listed in or eligible for listing in the California Register, or historic properties listed in or eligible for listing in the National Register, are within the direct or indirect APE of any project components. Therefore, Alternative 2 would result in the same impact and the ***same impact conclusion*** on historical resources or historic properties compared to the proposed project; no impact would result from construction of any project facilities.

Similar to Alternative 1, the construction of the Source Water Pipeline along Highway 1 and Dolan Road to Moss Landing would be adjacent to two previously recorded prehistoric archaeological sites. The results of a pedestrian survey in December 2014 were inconclusive as to whether these sites extend into the alignment. Two additional prehistoric archaeological sites and three historic-era artifact scatters are also within a 0.25-mile radius of Alternative 2 components north of Nashua Road and Highway 1 intersection. Alternative 2 would avoid the sites at CEMEX but the potential impacts on undiscovered archaeological resources would be increased compared to the proposed project because of the additional sites. The applicant would implement **Mitigation Measure Alt 1-CULT** (**Conduct Subsurface Survey**) and in the event that archaeological resources do extend into the Source Water Pipeline alignment, the applicant would avoid or otherwise mitigate significant impacts by conducting a data recovery investigation or other appropriate measures in accordance with **Mitigation Measure 4.15-2a** (**Establish Archaeologically Sensitive Area**) which includes provisions for an Archaeological Research Design and Treatment Plan in the event a significant archaeological resources cannot be avoided.

As stated previously in the setting, there is the potential for shipwrecks to be in the vicinity of Moss Landing. To determine whether shipwrecks or other submerged cultural resources are in the project vicinity, the project sponsor would have to implement a study that included a geophysical survey (magnetometer and side scan sonar) of the project area. Because the locations of all shipwrecks are not mapped, Alternative 2 could result in an increased potential impact compared to the proposed project. Implementation of **Mitigation Measures ALT 1-CULT** (**Conduct Subsurface Survey**) and **Mitigation Measure 4.15-2a** (**Establish Archaeologically Sensitive Area**) would reduce impacts on archaeological resources and Alternative 2 would result in the ***same impact conclusion*** compared to the proposed project, less than significant with mitigation.

Of the geologic units through which Alternative 2 would require excavation, Older Dune Sands and Terrace Deposits may have the potential for paleontological resources. The UCMP database search indicated a few microfossils have been identified from these younger geologic units but none near the location of Alternative 2. Therefore, potential impacts on paleontological resources would be increased compared to the proposed project but would result in the ***same impact conclusion***, less than significant.

While no known human remains have been documented within Alternative 2, the possibility of inadvertently uncovering human remains cannot be entirely dismissed. The potential inadvertent discovery of human remains would be increased compared to the proposed project because of the additional 6.5 miles of source water pipeline and could be mitigated to less than significant with implementation of **Mitigation Measure 4.15-4** (**Inadvertent Discovery of Human Remains**), which would ensure that if human remains are uncovered during project construction the Most Likely Descendant of the deceased Native American is contacted and the remains are treated per the recommendations of the Coroner. Alternative 2 would have the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

Impacts on cultural and paleontological resources, if any, would only occur during ground disturbing activity. There are no operational and facility siting impacts on cultural and paleontological resources and Alternative 2 would result in the ***same impact conclusions*** as the proposed project, no impact.

Cumulative Analysis

The geographic scope of analysis for potential cumulative cultural resources impacts encompasses locations where ground disturbing activity would occur under Alternative 2. In addition to the projects relevant to the cumulative scenario for the proposed project, the DeepWater Desal Project (No. 34 in **Table 4.1-2** in Section 4.1) would be located in close proximity to or overlapping Alternative 2 ground disturbance. This analysis assumes that all of the cumulative projects have a similar potential impact on cultural and paleontological resources. However, because each project's potential impacts would be site-specific to individual components, they would not combine with those of Alternative 2 to create a significant cumulative effect. Alternative 2 has the potential to disturb shipwrecks, which could be significant. The DeepWater Desal Project also would have the potential to disturb shipwrecks, potentially resulting in a significant cumulative impact to which the contribution of Alternative 2 would be significant. However, as described above, implementation of **Mitigation Measures Alt 1-CULT** and **4.15-2a** would result in avoidance of any shipwrecks. Alternative 2 would have a greater potential for a significant contribution to a significant cumulative impact on cultural resources, and would result in an ***increased impact conclusion*** compared to the proposed project, less than significant with mitigation.

5.5.15.6 Direct and Indirect Effects of Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The two pipelines for the intake and two pipelines for the discharge systems would be installed under the seafloor in MBNMS using HDD. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-3**, ASR 5 and 6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water that originated from the Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**). Therefore, the impact analysis of Alternative 3 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 3.

Construction Impacts

Construction of Alternative 3 near Moss Landing would impact two previously recorded prehistoric archaeological sites that have been evaluated as eligible for listing in the National Register of Historic Places. The results of the surface survey indicate these sites extend into the DeepWater Desal Project area (WSA, 2016). Two additional prehistoric archaeological sites and three historic-era artifact scatters are also within a 0.25-mile radius of Moss Landing, resulting in an increased potential impact on undiscovered resources and the need to implement **Mitigation Measure ALT 1-CULT** (**Conduct Subsurface Survey**). Further, if site locations cannot be avoided, implementation of **Mitigation Measure 4.15-2a** (**Establish Archaeologically Sensitive Area**) would be necessary to mitigate significant impacts on archaeological resources to less than significant.

As stated previously in the setting, there is also the potential for shipwrecks in the vicinity of Moss Landing. To determine whether shipwrecks or other submerged cultural resources are in the project vicinity, a study would be required that included a geophysical survey (magnetometer and side scan sonar) of the project area. Because the locations of shipwrecks are currently unknown, Alternative 3 could result in an increased potential impacts compared to the proposed project and implementation of **Mitigation Measures ALT 1-CULT** and **Mitigation Measure 4.15-2a** (**Establish Archaeologically Sensitive Area**) would result in an ***increased impact conclusion*** on historic properties or sites, and the ***same impact conclusion*** on archaeological resources compared to the proposed project, less than significant with mitigation.

Of the geologic units through which Alternative 3 would require excavation, Older Dune Sands and Terrace Deposits may have the potential for paleontological resources. The UCMP database search indicated a few microfossils had been identified from these younger geologic units but none near the location of Alternative 3. Therefore, the potential impact on paleontological resources would be the same compared to the proposed project and would result in the ***same impact conclusion***, less than significant.

While no known human remains have been documented within the Alternative 3 site, the possibility of inadvertently uncovering human remains cannot be entirely dismissed. The potential for inadvertent discovery of human remains would be the same compared to the proposed project and could be mitigated to less than significant with implementation of proposed project **Mitigation Measure 4.15-4** (**Inadvertent Discovery of Human Remains**), which would ensure that if human remains are uncovered during project construction the Most Likely Descendant of the deceased Native American is contacted and the remains are treated per the recommendations of the Coroner. Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

Impacts on cultural and paleontological resources, if any, would only occur during ground disturbing activity. There are no operational and facility siting impacts on cultural and paleontological resources and Alternative 3 would have the ***same impact conclusion*** as the proposed project, no impact.

Cumulative Analysis

The geographic scope of analysis for cumulative cultural resources impacts is defined by the location of the components of Alternative 3 and those of other projects that are located within the same area. The GWR Project (No. 59 in **Table 4.1-2** in Section 4.1) would be located south and east of the Alternative 3 components and would not geographically overlap with the Alternative 3 components. The Moss Landing Community Plan (No. 37) is located geographically near or overlapping some Alternative 3 components, but proposed development under this plan would not have physical impacts on cultural resources that could combine with those of Alternative 3. Other projects that include ground disturbance would be required to comply with similar mitigation to that described for Alternative 3, including inadvertent discovery measures, monitoring, and data recovery, which would reduce impacts to less-than-significant levels. Additionally, Alternative 3 has the potential to disturb shipwrecks, a potentially significant impact that could be reduced to less than significant with implementation of **Mitigation Measures ALT 1-CULT** and **Mitigation Measure 4.15-2a** (**Establish Archaeologically Sensitive Area**). However, no other project in the cumulative scenario for Alternative 3 would have the potential to disturb shipwrecks. Alternative 3 would result in an ***increased impact conclusion*** compared to the proposed project, less than significant with mitigation.

5.5.15.7 Direct and Indirect Effects of Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water that originated from the Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**). Therefore, the impact analysis of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4.

Construction Impacts

There are several structures at the proposed location of the Alternative 4 desalination plant on the National Refractories site that have not been evaluated for listing in the California and National Registers and this would be an increased impact on historic structures compared to the proposed project. If determined to be legally significant historical resources/historic properties, impacts from construction of Alternative 4 could result in an ***increased impact conclusion*** compared to the proposed project, significant and unavoidable.

The location of Alternative 4 near Moss Landing would be adjacent to two previously recorded prehistoric archaeological sites. Two additional prehistoric archaeological site and three historic-era artifact scatters are also within a 0.25-mile radius of the Alternative 4 and this would be an increased impact compared to the proposed project. Additionally, there is the potential for shipwrecks to be in Monterey Bay within MBNMS in the vicinity of Moss Landing. To determine whether shipwrecks or other submerged cultural resources are in the project vicinity, a study that includes a geophysical survey (magnetometer and side scan sonar) of the project area would be required. Because the locations of these resources are not entirely known relative to the Alternative 4 components north of the Nashua Road/Highway 1 intersection, there would be potentially significant impact. Implementation of **Mitigation Measure ALT 1-CULT** would reduce impacts to less than significant. Further, if site locations cannot be avoided, implementation of **Mitigation Measure 4.15-2a** (**Establish Archaeologically Sensitive Area**) would impacts on archaeological resources and Alternative 4 would result in the ***same impact conclusion*** compared to the proposed project, less than significant with mitigation.

Of the geologic units through which Alternative 4 would require excavation, Older Dune Sands and Terrace Deposits may have the potential for paleontological resources resource. The UCMP database search indicated a few microfossils from these younger geologic units had been identified but none near the location of Alternative 4. Therefore, the potential impact on paleontological resources would be the same, and Alternative 4 would result in the ***same impact conclusion*** compared to the proposed project, less than significant.

While no known human remains have been documented within the Alternative 4 site, the possibility of inadvertently uncovering human remains cannot be entirely discounted. The potential inadvertent discovery of human remains could be mitigated to less than significant with implementation of **Mitigation Measure 4.15-4** (**Inadvertent Discovery of Human Remains**), which would ensure that if human remains are uncovered during project construction the Most Likely Descendant of the deceased Native American is contacted and the remains are treated per the recommendations of the Coroner. Alternative 4 would result in the ***same impact conclusion***, less than significant with mitigation.

Operational and Facility Siting Impacts

Impacts on cultural and paleontological resources, if any, would only occur during ground disturbing activity. There are no operational and facility siting impacts on cultural and paleontological resources and Alternative 4 would have the ***same impact conclusion*** as the proposed project, no impact.

Cumulative Analysis

The geographic scope of analysis for cumulative cultural resources impacts is defined by the location of Alternative 4 and those of other projects that are located within the same area. The DeepWater Desal Project (No. 34 in **Table 4.1-2** in Section 4.1) and the Moss Landing Community Plan (No. 37) are located geographically near or overlapping some of the Alternative 4 components. Other projects that include ground disturbance would be required to comply with similar mitigation to that described for Alternative 4, including inadvertent discovery measures, monitoring, and data recovery, which would reduce impacts to less-than-significant levels. Alternative 4 has the potential for significant and unavoidable impacts on historical resources/historic properties at the National Refractories site. However, no other project in the cumulative scenario for Alternative 4 would be located at or result in impacts at the National Refractories site; therefore, a cumulative analysis is not relevant to this impact. Alternative 4 has the potential to disturb shipwrecks, which could be significant. The DeepWater Desal Project also would have the potential to disturb shipwrecks, potentially resulting in a significant cumulative impact to which the contribution of Alternative 4 would be significant. However, as described above, implementation of **Mitigation Measures Alt 1-CULT** and **4.15-2a** would result in avoidance of any shipwrecks. Alternative 4 would have a greater potential for a significant contribution to a significant cumulative impact on cultural resources; it would result in an ***increased impact conclusion*** compared to the proposed project, less than significant with mitigation.

5.5.15.8 Direct and Indirect Effects of Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction Impacts

Construction of Alternative 5a would occur in the same locations as the proposed project. Construction of Alternative 5b would be located in the same locations as Alternative 1 north of the Nashua Road/Highway 1 intersection. Therefore, even though Alternative 5a and 5b would have fewer wells and a reduced size desalination facility compared to the proposed project, and Alternative 5b would have a longer source water pipeline, Alternatives 5a and 5b would result in the ***same impact conclusions*** as the proposed project for historic properties (No Impact), archaeological resources (less than significant with mitigation), paleontological resources (less than significant) and disturbance of human remains (less than significant with mitigation). CalAm would need to implement **Mitigation Measure ALT 1-CULT (Conduct Subsurface Investigation)** for Alternative 5b and **Mitigation Measure 4.15-2a** (**Establish Archaeologically Sensitive Area**) and **Mitigation Measure 4.15-4** (**Inadvertent Discovery of Human Remains**), for both Alternatives 5a and 5b to reduce the impact on archaeological resources and disturbance of human remains to less than significant.

Operational and Facility Siting Impacts

Impacts on cultural and paleontological resources, if any, would only occur during ground disturbing activity. There are no operational and facility siting impacts on cultural and paleontological resources and Alternatives 5a and 5b would have the ***same impact conclusions*** as the proposed project, no impact.

Cumulative Analysis

Combined Impacts with GWR Project

The GWR Project (No. 59 in **Table 4.1-2** in Section 4.1) would have similar potential impacts on cultural and paleontological resources as ground disturbance under Alternatives 5a and 5b. However, because each project's potential impacts would be site-specific to individual components, they would not combine to result in a significant cumulative impact.

Impacts of Full Cumulative Scenario

The cumulative impact analysis for Alternatives 5a and 5b would be the same as that described for the proposed project and Alternative 1, respectively. As described above, the GWR Project would not contribute to a cumulative impact with Alternatives 5a and 5b. Therefore, Alternatives 5a and 5b would have the ***same impact conclusion*** as the proposed project, less than significant.

5.5.15.9 References

William Self Associates (WSA), 2016. *Cultural Resources Assessment Report, Monterey Bay Regional Water Project, Main Facility Site, Moss Landing, Monterey County, California*. Prepared for DeepWater Desal LLC, April 2016.

5.5.16 Agricultural Resources

The evaluation criteria for Agricultural Resources address: disruption of agricultural activities or permanent conversion of farmland to non-agricultural use; conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use; and potential conflicts with zoning for agricultural uses or with Williamson Act contracts.

5.5.16.1 Setting/Affected Environment

The environmental setting and regulatory framework for the alternatives would be similar to the proposed project, which includes local and state regulations that apply to agricultural resources in Monterey County. As such, descriptions of the environmental setting and regulatory framework for agricultural resources are provided in Section 4.16. The environmental setting for the components that are common to the proposed project are also discussed in Section 4.16. This section focuses on the facilities that are unique to the alternatives

The area north of the Salinas River and south of the Moro Cojo Slough is primarily Prime Farmland, with small pockets of Farmland of Statewide Importance, Unique Farmland, and Grazing Lands as designated by the California Department of Conservation (CDC) Farmland Mapping and Monitoring Program (FMMP) (CDC, 2015). Williamson Act contracted lands make up approximately half of the agricultural parcels in this area (CDC, 2016) and the area is primarily zoned for Agricultural Preservation (Monterey County, 2007).

In the Moss Landing area north of the Moro Cojo Slough, lands are designated primarily as Urban and Built-Up, and Other Land (CDC, 2015). No agricultural zoning exists there except for a parcel located one mile from Highway 1 on the north side of Dolan Road that is designated for Agricultural Preservation (Monterey County, 2007).

5.5.16.2 Direct and Indirect Effects of the Proposed Project – Slant Wells at CEMEX

The proposed project extends from Castroville in the north to the city of Carmel in the south (see **Figure 3-2**) and would include construction of a desalination plant on 25 acres along Charles Benson Road northeast of the City of Marina, up to nine new subsurface slant wells at the CEMEX active mining area, two new wells (ASR-5 and ASR-6) at the existing Seaside Groundwater Basin ASR system, the Carmel Valley Pump Station, and about 21 miles of water conveyance pipelines. The direct and indirect impacts of the proposed project are described in detail in Section 4.7.5.

The following paragraphs briefly summarize the impacts of the proposed project with respect to agricultural resources. The detailed impact analysis of the proposed project is provided in Section 4.16.

Impact 4.16-1: Result in changes in the existing environment that, due to their location or nature, could temporarily disrupt agricultural activities or result in the permanent conversion of farmland to non-agricultural use.

Construction of the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline that would be installed within a 2,500 foot segment of designated farmland that is currently under cultivation for flower production north of Charles Benson Road would cause physical changes to the environment that could result in the conversion of farmland to non-agricultural uses, a significant impact. Implementation of **Mitigation Measure 4.16-1** (**Minimize Disturbance to Farmland**) would reduce this impact to a less-than-significant level. This measure requires coordination with property owners, separation of soil layers when stockpiling during excavation, avoidance of soil compaction measures, and inspection and restoration of all drainage systems.

None of the other proposed facilities or pipeline alignments in areas mapped as designated farmland by the California Department of Conservation would result in conversion of farmland since installation would be confined to rights-of-way or road shoulders where no crops are grown, or land that has been fallow for more than four years prior to the farmland mapping date.

Impact 4.16-2: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use.

Implementation of the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline installed in the farmland north of Charles Benson Road would result in a less-than-significant impact related to the permanent conversion of important farmland to non-agricultural uses since farming practices would resume after construction and important farmland would not be displaced. For all other facilities, no impact would result.

Impact 4.16-3: Conflict with zoning for agricultural uses or with Williamson Act contracts.

None of the proposed facilities would conflict with agricultural zoning. The Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline installed in farmland north of Charles Benson Road (a portion of which is designated as Williamson Act land) would result in a less-than-significant impact related to conflicts with Williamson Act contracts because existing agricultural uses could resume during operations. All other proposed facilities, including all optional pipeline alignments, would have no impact on Williamson Act land.

Impact 4.16-C: Cumulative impacts related to agricultural resources.

Proposed project construction could have a significant contribution to significant cumulative effects on the conversion of farmland to non-agricultural use because cumulative projects in the project area would temporarily disrupt agricultural uses during construction, but since cumulative projects enlist mitigation measures to reduce construction impacts and because the proposed project would implement mitigation measures identified in Impact 4.16-1, this impact would be reduced to a less-than-significant level. Project operations would not have a significant contribution to a cumulative impact associated with the conversion of Prime Farmland, Unique Farmland, Farmland of

Statewide Importance to non-agricultural use, nor with land zoned for agricultural uses or with Williamson Act contracts regardless of the impacts of other projects in the cumulative scenario because it would not result in the conversion of such resources during operation.

5.5.16.3 Direct and Indirect Effects of No Project Alternative

Under the No Project Alternative, no new facilities would be constructed and the existing test slant well would be decommissioned. Consequently, there would be no ground disturbance or placement of new structures that could affect agricultural resources, and thus no construction-related direct or indirect impacts on agricultural resources. Additionally, changes in future water supplies described in Section 5.4.2 as a result of the No Project Alternative would not directly or indirectly adversely affect the availability of water currently used for agricultural purposes, and thus would not result in the permanent conversion of farmland to non-agricultural use. Because the No Project Alternative would have no direct or indirect impacts with respect to agricultural resources, it could not contribute to cumulative effects related to these topics.

5.5.16.4 Direct and Indirect Effects of Alternative 1 - Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.4.3). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**). Therefore, the agricultural impact analysis of Alternative 1 focuses primarily on locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 1.

Construction Impacts

The intakes at the Potrero Road parking lot would not be located within or adjacent to farmland. Therefore, construction of these components would have no impact on agricultural resources. North of the Salinas River, construction of the alternative source water pipeline would not result in the disturbance of agricultural activities or farmland because the disturbance would be contained to rights-of-way, and would not extend into cultivated land. Construction would not affect soil conditions in farmland areas and would not result in the conversion of farmland to non-agricultural uses. No impact on agricultural activities or farmland would result from construction of the source water pipeline north of the Salinas River.

Thus, combining the impacts of the components common to the proposed project and Alternative 1 with the addition of 5.5 miles of source water pipeline and slant wells at Potrero Road, construction of Alternative 1 would have the same potential for disruption to agricultural activities or the conversion of farmland to non-agricultural use, but with implementation of

Mitigation Measure 4.16-1 (**Minimize Disturbance to Farmland**), would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

The intake system at Potrero Road would not be located within or adjacent to Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, land zoned for agricultural uses, or land under Williamson Act contract. Therefore, operation and siting of the intake system would have no impact on agricultural resources. Since the alternative source water pipeline would be located within rights-of-way and not within cultivated land, the additional 5.5 miles of pipeline would have no impact on Prime Farmland, Farmland of Statewide Importance, or Williamson Act contracts. The source water pipeline would be buried, and therefore, consistent with Section 21.64.160 of the Monterey County Zoning Ordinance, which allows underground public utilities in all zoning districts without obtaining a use permit.

Thus, combining the impacts of components common to the proposed project and Alternative 1 with the addition of 5.5 miles of source water pipeline and slant wells at Potrero Road, operation of Alternative 1 would result in the ***same impact conclusion*** as the proposed project with respect to both operational evaluation criteria, conversion of farmland to non-agricultural use and conflicts with zoning for agricultural uses or with Williamson Act contracts, less than significant.

Cumulative Analysis

The geographic scope of analysis for cumulative impacts related to agricultural resources for Alternative 1 is defined by the location of the Alternative 1 components, and is the same as that described for the proposed project in Section 4.16.6, with the exception of the different location of the subsurface intake system (Potrero Road, instead of CEMEX), and the alternative source water pipeline route. The cumulative scenario for Alternative 1 includes the Regional Urban Water Augmentation Project (RUWAP) Recycled Water Project (No. 35), the Monterey Peninsula Light Rail Project (No. 38), and the DeepWater Desal Project (No. 34) described in **Table 4.1-2** in Section 4.1. Cumulative impacts from construction and operation of Alternative 1 would be the same as those described for the proposed project. Construction impacts have the potential to be significant, but with implementation of mitigation measures described above, Alternative 1 would not have a significant contribution to significant cumulative impacts. Operational and facility siting impacts would have a less than significant contribution to significant cumulative impacts related to farmland conversion, conflicts with zoning, or Williamson Act lands. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to agricultural resources, less than significant with mitigation.

5.5.16.5 Direct and Indirect Effects of Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water that originated from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to Castroville Community Services District would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**). Therefore, the agricultural impact analysis of Alternative 2 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 2.

Construction Impacts

The intake system at Moss Landing and the pump station on Dolan Road would not be located within or adjacent to farmland. Therefore, construction of these components would have no impact on agricultural resources. No part of the source water pipeline from Dolan Road to Potrero Road would be constructed within or adjacent to farmland. From Potrero Road south, the alternative source water pipeline would be the same as Alternative 1. There would be no impacts on farmland from construction of Alternative 2 components north of the Salinas River.

Thus, combining the impacts of the components common to the proposed project and Alternative 2 with the addition of 6.5 miles of source water pipeline and the open water intake system, construction of Alternative 2 would have the same potential for disruption to agricultural activities or the conversion of farmland to non-agricultural use, but with implementation of **Mitigation Measure 4.16-1** (**Minimize Disturbance to Farmland**), would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

The intake system at Moss Landing and the pump station on Dolan Road would not be located within or adjacent to Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, land zoned for agricultural uses, or land under Williamson Act contract; therefore, operation and siting of the intake system would have no impact on agricultural resources.

No part of the alternative source water pipeline from Dolan Road to Potrero Road would be located within or adjacent to Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, or land under Williamson Act contracts. A small portion of this alignment would be located in the right-of-way adjacent to land zoned for Agricultural Conservation (Monterey County, 2007), but the pipeline would be buried and therefore consistent with Section 21.64.160 of the Monterey County Zoning Ordinance, which allows underground public utilities in all zoning districts, without the necessity of obtaining a use permit.

From Potrero Road south, the alternative source water pipeline would be the same as the source water pipeline in Alternative 1. In sum, there would be no impact on Prime Farmland, Unique

Farmland, or Farmland of Statewide Importance, land zoned for agricultural uses, or Williamson Act contracts from the operation and siting of the source water pipeline north of the Salinas River.

Thus, combining the impacts of the components common to the proposed project and Alternative 2 with the addition of 6.5 miles of source water pipeline and the open water intake system, operation of Alternative 2 would result in the ***same impact conclusion*** as the proposed project with respect to both operational evaluation criteria, conversion of farmland to non-agricultural use and conflicts with zoning for agricultural uses or with Williamson Act contracts, less than significant.

Cumulative Analysis

The geographic scope of analysis for cumulative impacts related to agricultural resources for Alternative 2 is defined by the location of the Alternative 2 components, and is the same as that described for the proposed project in Section 4.16.6, with exception of the different location of the seawater intake system (Moss Landing instead of CEMEX) and the alternative source water pipeline route, and the elimination of the Castroville Pipeline and Pipeline to CSIP. The cumulative scenario for Alternative 2 includes the Regional Urban Water Augmentation Project (RUWAP) Recycled Water Project (No. 35), the Monterey Peninsula Light Rail Project (No. 38) and the DeepWater Desal Project (No. 34) described in **Table 4.1-2** in Section 4.1. Cumulative impacts from construction and operation of Alternative 2 would be the same as those described for the proposed project. Construction impacts have the potential to be significant, but with implementation of **Mitigation Measure 4.16-1**, Alternative 2 would have a less than significant contribution to significant cumulative impacts. Operational and facility siting impacts would not have a less than significant contribution to significant cumulative impacts related to farmland conversion, conflicts with zoning, or Williamson Act lands. Therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to agricultural resources, less than significant with mitigation.

5.5.16.6 Direct and Indirect Effects of Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The pipelines for the intake and discharge systems would be installed using HDD. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the “Connection to CalAm” Point on **Figure 5.4-3**, ASR 5 and 6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the proposed project Castroville

Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. In addition, proposed project components along Charles Benson Road would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**). Therefore, the agricultural impact analysis of Alternative 3 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 3.

Construction Impacts

The seawater intake system at Moss Landing, source water pipeline, and brine discharge pipeline and outfall would not be located within or adjacent to farmland. Therefore, construction of these components would have no impact on agricultural resources. The desalination plant, data center, and substation would border farmland, but construction activities would be contained to the project area boundary and not disturb agricultural activities or convert farmland to non-agricultural uses. From Dolan Road and Highway 1, the desalinated water pipeline would be the same as the source water pipeline in Alternative 2, and similarly would have no impact on agricultural resources. Up to 25 miles of additional desalinated water pipelines would need to be constructed to deliver excess water (above the 9.6 mgd demand from CalAm's Monterey District service area) to potential customers in Santa Cruz County, Salinas, or both. Due to the presence of farmland between Moss Landing and Santa Cruz County to the north and Salinas to the southeast, it is likely that construction of these pipelines could be located in rights-of-way, but would still have the potential to disturb agricultural activities or result in the conversion of farmland; however, the exact alignments for these pipelines are currently not known.

South of the Salinas River, the desalinated water pipeline would join the proposed project at the "Connection to CalAm" Point. No pipelines would be constructed within farmland north of Charles Benson Road. All pipelines would be constructed within rights-of-way and no disturbance to farmland would result.

Because construction of pipelines between Moss Landing and Santa Cruz County to the north and Salinas to the southeast could disturb agricultural activities or convert farmland, Alternative 3 has an increased potential to impact agricultural resources compared to the proposed project; however, implementation of **Mitigation Measure 4.16-1** (**Minimize Disturbance to Farmland**) would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational and Facility Siting Impacts

The intake system at Moss Landing, source water pipeline, desalination plant, data center, substation, and brine discharge pipeline and outfall would not be located within or adjacent to Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, or land under Williamson Act contract. Therefore, operation of these components would have no impact on agricultural resources. The desalination plant, data center and substation would border land zoned for Agricultural Preservation, but the footprint would not extend into agricultural land and no impact would result.

Operational and facility siting impacts of the desalinated water pipeline would be the same as described for the source water pipeline in Alternative 2; no impact on Prime Farmland, Unique Farmland, Farmland of Statewide Importance, land zoned for agricultural uses, or Williamson Act contracts would result.

Because pipelines between Moss Landing and Santa Cruz County to the north and Salinas to the southeast could be installed within designated farmland or Williamson Act contracts, Alternative 3 has an increased potential to impact agricultural resources compared to the proposed project. However, since underground utilities are allowed in all zoning districts in Monterey County and Santa Cruz County (Santa Cruz County, 2015), and since agricultural uses could resume during operations, Alternative 3 would have the ***same impact conclusion*** as the proposed project with respect to both operational evaluation criteria, conversion of farmland to non-agricultural use and conflicts with zoning for agricultural uses or with Williamson Act contracts, less than significant.

Cumulative Analysis

The geographic scope of analysis for cumulative agricultural impacts for Alternative 3 is defined by the location of the Alternative 3 components. The cumulative scenario for Alternative 3 includes the Regional Urban Water Augmentation Project (RUWAP) Recycled Water Project (No. 35) and the Monterey Peninsula Light Rail Project (No. 38), described in **Table 4.1-2** in Section 4.1. Construction impacts have the potential to be significant, but with implementation of **Mitigation Measure 4.16-1**, Alternative 3 would have a less than significant contribution to significant cumulative impacts. Operational and facility siting impacts would have a less than significant contribution to significant cumulative impacts related to farmland conversion or Williamson Act lands. Therefore, Alternative 3 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to agricultural resources, less than significant with mitigation.

5.5.16.7 Direct and Indirect Effects of Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. In addition, proposed project components along Charles Benson Road would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**). Therefore, the agricultural impact analysis of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4.

Construction Impacts

The intake system at Moss Landing, source water pipeline, desalination plant, and brine discharge pipeline and outfall would not be located within or adjacent to farmland. Therefore, construction of these components would have no impact on agricultural resources.

From Dolan Road and Highway 1 south, the desalinated water pipeline would be the same as the source water pipeline in Alternative 2, and similarly would have no impact on agricultural resources. Similar to Alternative 3, pipelines south of the Salinas River would be constructed within rights-of-way and no disturbance to farmland would result. Thus, combining the impacts of proposed project components with the addition of the components unique to Alternative 4, construction of Alternative 4 would result in a ***reduced impact conclusion*** compared to the proposed project, no impact.

Operational and Facility Siting Impacts

The intake system at Moss Landing, the source water pipeline, desalination plant, and brine discharge pipeline and outfall would not be located within or adjacent to Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, land zoned for agricultural uses, or land under Williamson Act contract. Therefore, operation of these components would have no impact on agricultural resources.

From Dolan Road and Highway 1 south, the desalinated water pipeline would be the same as the source water pipeline in Alternative 2; therefore, there would be no impacts on Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, land zoned for agricultural uses, or Williamson Act contracts from the operation and siting of the source water pipeline north of the Salinas River. No pipelines south of the Salinas River would be installed in areas mapped as designated farmland, land zoned for agricultural uses, or Williamson Act contracts.

Thus, combining the impacts of proposed project components with the addition of components unique to Alternative 4, operation and siting of Alternative 4 would result in a ***reduced impact conclusion*** compared to the proposed project, no impact.

Cumulative Analysis

Because construction and operation of Alternative 4 would have no impact on agricultural resources, Alternative 4 would not contribute to a cumulative impact on agricultural resources. Therefore, Alternative 4 would result in a ***reduced impact conclusion*** compared to the proposed project for cumulative effects related to agricultural resources, no impact.

5.5.16.8 Direct and Indirect Effects of Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction, Operational, and Facility Siting Impacts

Alternatives 5a and 5b would have the same pipeline configurations and facility locations as the proposed project and Alternative 1, respectively. Therefore, Alternatives 5a and 5b would have the same construction impacts on agricultural resources as the proposed project and Alternative 1, respectively. Thus, construction of Alternatives 5a and 5b would have the same potential for disruption to agricultural activities or the conversion of farmland to non-agricultural use, but with implementation of **Mitigation Measure 4.16-1** (**Minimize Disturbance to Farmland**), would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation. Similarly, operation of Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

Combined Impacts with GWR Project

As described in the GWR Project FEIR (MRWPCA, 2016), the GWR Project would have no permanent impact on agricultural resources. It would result in temporary disruption to agricultural production during construction of the Salinas Treatment Facility and a portion of the Blanco Drain Diversion that would be of the same nature as temporary impacts described for the proposed project. The GWR Project would not convert farmland to non-agricultural use, and after implementation of adopted GWR FEIR **Mitigation Measure LU-1**, which would minimize disturbance to farmland during construction of these components, GWR Project impacts would be less than significant. The GWR Project would have no impact on the conversion of important farmland during operation, and no impact related to conflicting with zoning for agricultural uses or Williamson Act contracts during construction or operation (MRWPCA, 2016). Therefore, it would not contribute to the less-than-significant impacts of Alternatives 5a and 5b. Because both projects would minimize construction-related disturbance to farmland through mitigation, the combined temporary impact of construction-related disturbance from Alternatives 5a or 5b and the GWR Project would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Impacts of Full Cumulative Scenario

The geographic scope for the cumulative analysis of impacts from Alternative 5a and 5b is the same as that described for the proposed project and Alternative 1, respectively. The cumulative scenario for Alternatives 5a and 5b includes the same projects discussed for the cumulative analysis of the proposed project, with the addition of the GWR Project, which as described above would not increase the overall cumulative impact. Therefore, Alternatives 5a and 5b would have the same contribution to cumulative impacts on agricultural resources as the proposed project during construction and operation. Construction impacts have the potential to be cumulatively significant, but with implementation of mitigation measures described above, Alternatives 5a and 5b would have a less than significant contribution to significant cumulative impacts. Operational and facility siting impacts would have a less than significant contribution to cumulative impacts related to farmland conversion, conflicts with zoning, or Williamson Act lands. Therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to agricultural resources, less than significant with mitigation.

5.5.16.9 References

California Department of Conservation (CDC), Division of Land Resource Protection, 2015. *Monterey County Important Farmland 2012, Sheet 1 of 2*. Available online at: ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/.../2012/mnt12_no.pdf. Accessed May 6, 2016.

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5.5.17 Mineral Resources

The evaluation criteria for Mineral Resources address the loss of availability of known mineral resources that are of value to the region or residents of the state and the loss of a locally recognized important mineral resource recovery site.

5.5.17.1 Setting/Affected Environment

The environmental setting and regulatory framework for the alternatives would be similar to the proposed project, which includes local and state regulations that apply to mineral resources in Monterey County. As such, descriptions of the environmental setting and regulatory framework for mineral resources are provided in Chapter 4.17. The environmental setting for the components that are common to the proposed project are also discussed in Chapter 4.17. This section focuses on the facilities that are unique to the alternatives.

The setting for facilities unique to the alternatives includes the area north of the Salinas River and south of Elkhorn Slough. This area has no MRZ-2 designation (areas with limited mining potential) but a small portion is classified as MRZ-1 (areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence) and MRZ-4 (areas where available information is inadequate for assignment to any other zone), as mapped by the California Department of Conservation, California Geological Survey (CDMG, 1987).

5.5.17.2 Direct and Indirect Effects of the Proposed Project (Slant Wells at CEMEX)

Impact 4.17-1: Loss of availability of known mineral resources that are of value to the region or residents of the state, or result in the loss of a locally recognized important mineral resource recovery site.

The proposed slant wells site at the CEMEX sand mining facility, portions of the Source Water Pipeline, the MPWSP Desalination Plant, the Brine Discharge Pipeline, the Pipeline to CSIP Pond, the new Desalinated Water Pipeline, the southern portion of the Castroville Pipeline, the new Transmission Main, the ASR conveyance pipelines, the ASR 5 and ASR-6 Wells, and the Ryan Ranch-Bishop Interconnection Improvements would be located in areas designated as MRZ-2 – that is, areas where information indicates that significant mineral deposits (in this case, sand for use as aggregate) are either present or are likely to be present. The subsurface slant wells for the intake system are proposed within the southern portion of the CEMEX property, in an area that is no longer mined and has been restored by CEMEX consistent with the Reclamation Plan. The proposed Source Water Pipeline would be aligned beneath the existing CEMEX access road. Although mining operations could experience minor disruptions during project construction, mining activities would continue throughout project construction and potentially during the first several months of operations. Therefore, project implementation would not result in the temporary loss of known mineral resources and temporary construction-related impacts would be less than significant. Operation of the slant wells could preclude mineral resource extraction but since this particular area is no longer being mined, is under a reclamation plan, and it is unlikely that future sand mining would be permitted in the southern portion of the CEMEX property, this impact would be less than significant.

The seafloor and subsurface mineral materials (e.g., sand, sediments) within MBNMS would provide filtration for the water taken in by the subsurface slant wells. The proposed project's filtration process would not result in the loss of a known mineral resource and no mineral resource consumption or extraction would occur related to the operation of the subsurface slant wells, and therefore, no impact would occur.

Construction and operation of the MPWSP Desalination Plant, which is located in an area designated as MRZ-2, could limit future recovery of mineral resources beneath the plant footprint. However, California Department of Conservation designated important farmland surrounds the site, and mineral extraction would be an incompatible use. Implementation of the desalination plant would have a less than significant impact on mineral resources. All proposed pipelines within MRZ-2 would have a less than significant impact on mineral resources since they would be constructed in or adjacent to rights-of-way and would have limited footprints.

Portions of the Castroville Pipeline north of the Salinas River would be located within MRZ-1 and MRZ-4, which are areas where information indicates that no significant mineral deposits are likely to be present, and areas where information is inadequate to assign a mineral resource zone, respectively. The Main System–Hidden Hills Interconnection Improvements, and the Carmel Valley Pump Station would not be located within an MRZ. These components would have no impact on mineral resources.

Impact 4.17-C: Cumulative impacts related to mineral resources.

The proposed project construction and operation would not contribute to cumulative impacts on mineral resources because all cumulative projects in MRZ-2 are on developed lands or on land where mining is prohibited.

5.5.17.3 Direct and Indirect Effects of No Project Alternative

Under the No Project Alternative, no new facilities would be constructed and the existing test slant well would be decommissioned. Consequently, there would be no ground disturbance or placement of new structures that could affect mineral resources, and thus no construction- or operation-related direct or indirect impacts relative to mineral resources associated with the No Project Alternative. Because the No Project Alternative would have no direct or indirect impacts with respect to mineral resources, it could not contribute to cumulative effects related to these topics.

5.5.17.4 Direct and Indirect Effects of Alternative 1 – Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.4.3). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**). Therefore, the mineral resources impact analysis of Alternative 1 focuses primarily on locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 1.

Construction and Operational Impacts

No Alternative 1 components north of the Salinas River would be located in an active mining area or MRZ-2. Portions of the source water pipeline would be located in land designated as MRZ-1 and MRZ-4. Therefore, construction and operation of Alternative 1 components north of the Salinas River would have no impact on mineral resources. Because the slant wells would not be located on MRZ-2 lands, Alternative 1 would have a decreased potential to result in the loss of mineral resources or a mineral resource recovery site, compared to the proposed project. Since Alternative 1 components south of the Salinas River would be located in MRZ-2, but with limited mining potential, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

The geographic scope of analysis for cumulative impacts related to mineral resources for Alternative 1 is defined by the location of Alternative 1 components, and is the same as that described for the proposed project in Section 4.17.6, with exception of the different location of the subsurface intake system (Potrero Road, instead of CEMEX), and the alternative source water pipeline route. Alternative 1 would reduce impacts on mineral resources compared to the proposed project, reducing construction within land designated as MRZ-2. No new impacts on mineral resources would occur under Alternative 1. Therefore, as described for the proposed project, the combined effects of cumulative projects in MRZ-2 would not have a significant cumulative impact on the availability of mineral resources relative to the total amount of known mineral resources available. As a result, implementation of Alternative 1 would have a less than significant contribution to a cumulative mineral resources effect. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to mineral resources, less than significant.

5.5.17.5 Direct and Indirect Effects of Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed

Project. Because the open water intake would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to Castroville Community Services District would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**). Therefore, the mineral resource impact analysis of Alternative 2 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 2.

Construction and Operational Impacts

No Alternative 2 components north of the Salinas River would be located in an active mining area or MRZ-2. Portions of the source water pipeline would be located in land designated as MRZ-1 and MRZ-4. Therefore, construction and operation of Alternative 2 components north of the Salinas River would have no impact on mineral resources. Because the seawater intake would not be located on MRZ-2 lands, Alternative 2 would have a decreased potential to result in the loss of mineral resources or a mineral resource recovery site, compared to the proposed project. Since Alternative 2 components south of the Salinas River would be located in MRZ-2, but with limited mining potential, Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

The geographic scope of analysis for cumulative impacts related to mineral resources for Alternative 2 is defined by the location of Alternative 2 components, and is the same as that described for the proposed project in Section 4.17.6, with exception of the different location of the seawater intake system (Moss Landing, instead of CEMEX), and the alternative source water pipeline route. Alternative 2 would reduce impacts on mineral resources compared to the proposed project, reducing construction within land designated as MRZ-2. No new impacts on mineral resources would occur under Alternative 2. Therefore, as described for the proposed project, the combined effects of cumulative projects in MRZ-2 would not have a significant cumulative impact on the availability of mineral resources relative to the total amount of known mineral resources available. As a result, implementation of Alternative 2 would have a less than significant contribution to a cumulative mineral resources effect. Therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to mineral resources, less than significant.

5.5.17.6 Direct and Indirect Effects of Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The pipelines for the intake and discharge systems would be installed using HDD. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the “Connection to CalAm” Point on **Figure 5.4-3**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**). Therefore, the mineral resources impact analysis of Alternative 3 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 3.

Construction and Operational Impacts

No Alternative 3 components north of the Salinas River would be located in an active mining area or MRZ-2. Portions of the source water pipeline would be located in land designated as MRZ-1 and MRZ-4. Therefore, construction and operation of Alternative 3 components north of the Salinas River would have no impact on mineral resources. Because the seawater intake system would not be located on MRZ-2 lands, Alternative 3 would have a decreased potential to result in the loss of mineral resources or a mineral resource recovery site, compared to the proposed project. Since Alternative 3 components south of the Salinas River would be located in MRZ-2, but with limited mining potential, Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

The geographic scope of analysis for cumulative impacts related to mineral resources for Alternative 3 is defined by the location of Alternative 3 components. Alternative 3 would reduce impacts on mineral resources compared to the proposed project, reducing construction within land designated as MRZ-2. No new impacts on mineral resources would occur under Alternative 3. Therefore, as described for the proposed project, the combined effects of cumulative projects in MRZ-2 would not have a significant cumulative impact on the availability of mineral resources relative to the total amount of known mineral resources available. As a result, implementation of Alternative 3 would have a less than significant contribution to a cumulative mineral resources effect. Therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to mineral resources, less than significant.

5.5.17.7 Direct and Indirect Effects of Project Alternative 4 – People’s Moss Landing Water Desalination Project (People’s Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**). Therefore, the mineral resources impact analysis of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4.

Construction and Operational Impacts

No Alternative 4 components north of the Salinas River would be located in an active mining area or MRZ-2. Portions of the source water pipeline would be located in land designated as MRZ-1 and MRZ-4. Therefore, construction and operation of Alternative 4 components north of the Salinas River would have no impact on mineral resources. Because the seawater intake system would not be located on MRZ-2 lands, Alternative 4 would have a decreased potential to result in the loss of mineral resources or a mineral resource recovery site, compared to the proposed project. Since Alternative 4 components south of the Salinas River would be located in MRZ-2, but with limited mining potential, Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

The geographic scope of analysis for cumulative impacts related to mineral resources for Alternative 4 is defined by the location of Alternative 4 components. Alternative 4 would reduce impacts on mineral resources compared to the proposed project, reducing construction within land designated as MRZ-2. No new impacts on mineral resources would occur under Alternative 4. Therefore, as described for the proposed project, the combined effects of cumulative projects in MRZ-2 would not have a significant cumulative impact on the availability of mineral resources relative to the total amount of known mineral resources available. As a result, implementation of Alternative 4 would have a less than significant contribution to a cumulative mineral resources effect. Therefore, Alternative 4 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to mineral resources, less than significant.

5.5.17.8 Direct and Indirect Effects of Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction and Operational Impacts

All components of Alternative 5a would be in the same location as the proposed project, but with fewer slant wells at CEMEX. Therefore, construction and operation of Alternative 5a would have a decreased potential to result in the loss of mineral resources or a mineral resource recovery site, compared to the proposed project. Alternative 5a would result in the ***same impact conclusion*** as the proposed project, less than significant.

All components of Alternative 5b would be in the same location as Alternative 1. Therefore, construction and operation of Alternative 5b would have a decreased potential to result in the loss of mineral resources or a mineral resource recovery site, compared to the proposed project. Alternative 5b would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

Combined Impacts with GWR Project

The GWR Project (No. 59 in **Table 4.1-2** in Section 4.1) would have no impact on the availability of mineral resources during construction, and would have a less-than-significant impact on availability of mineral resources during operations (MRWPCA, 2016). No mineral extraction currently is occurring within the GWR Project component sites, and the GWR Project would not preclude or obstruct future mineral extraction in areas potentially subject to mineral development. In combination with Alternatives 5a and 5b, the GWR Project would result in a less-than-significant impact on mineral resources.

Impacts of Full Cumulative Scenario

The geographic scope for the cumulative analysis of impacts from Alternatives 5a and 5b is the same as that described for the proposed project and Alternative 1, respectively. Impacts from construction and operation of Alternatives 5a and 5b would be the same as those described for the proposed project and Alternative 1, respectively. One additional project, the GWR Project, would be relevant to the cumulative scenario for Alternatives 5a and 5b. As indicated above, the addition of the GWR Project would not result in significant cumulative impact. Therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to mineral resources, less than significant.

5.5.17.9 References

California Division of Mines and Geology (CDMG), 1987. *Mineral Land Classification: Aggregate Materials in the San Francisco-Monterey Bay Area*, Special Report 146, Part IV, Monterey Bay Production-Consumption Region, 1987.

Monterey Regional Water Pollution Control Agency (MRWPCA), 2016. *Consolidated Final Environmental Impact Report for the Pure Water Monterey Groundwater Replenishment Project.* January 2016.

5.5.18 Energy Conservation

The evaluation criteria for Energy Conservation address: use of large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during construction and decommissioning; use of large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during operations and maintenance; and, constrain local or regional energy supplies, require additional capacity, or affect peak and base periods of electrical demand during operations.

5.5.18.1 Setting/Affected Environment

The setting/affected environment for alternatives is the same as described for the proposed project in Section 4.18, Energy Conservation, and the reader is referred to that section for a detailed description.

5.5.18.2 Direct and Indirect Effects of Proposed Project (Slant Wells at CEMEX)

Impact 4.18-1: Use large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during construction and decommissioning.

Construction of the proposed project (and decommissioning) would require the use of fuels for operation of heavy construction equipment (e.g., dozers, excavators, and trenchers), construction vehicles (e.g., dump and delivery trucks), and construction worker vehicles. Operation of some construction equipment (e.g., welding machines and electric power tools) would require the use of electricity. Construction (and decommissioning) would also result in indirect energy use associated with the extraction, manufacturing, and transportation of raw materials to make construction materials.

Construction (and decommissioning) activities could result in wasteful or inefficient use of energy if equipment is not well maintained, if equipment is left to idle when not in use, or if haul trips are not planned efficiently. The potential to use large amounts of fuel or energy in a wasteful manner is considered a significant impact. However, implementation of **Mitigation Measures 4.18-1** (**Construction Equipment and Vehicle Efficiency Plan**) and **4.10-1c** (**Idling Restrictions**) would reduce the impact to a less-than-significant level.

Impact 4.18-2: Use large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during operations and maintenance.

Operation and maintenance of the proposed project would result in the consumption of fuel for CalAm staff commute trips to and from the MPWSP Desalination Plant, and vehicle trips associated with routine maintenance and operations. Project operations would also result in the consumption of electricity to operate the MPWSP Desalination Plant (i.e., reverse osmosis [RO] modules, pumps, lighting, process controls, heating, ventilation, and air conditioning [HVAC] systems) and other proposed facilities (i.e., ASR Pump Station, Carmel Valley Pump Station, etc.). Although implementation of the proposed project would result in a substantial increase in electrical power demand (63,364 MWh/year minus a baseline energy use of 11,466 MWh/year equals a net increase of 51,898 MWh/year), the use of energy for operation of the MPWSP

Desalination Plant is necessary because it would provide a reliable supply of water to meet existing demand for the Monterey District. Therefore, electricity consumed as a result of project operations would not be wasteful or inefficient and the impact related to the use of fuel and energy during project operations would be less than significant.

Impact 4.18-3: Constrain local or regional energy supplies, require additional capacity, or affect peak and base periods of electrical demand during operations.

Implementation of the proposed project would increase CalAm's total electrical demand by an amount that would represent approximately two percent of the County's electricity usage in 2014. The preliminary review of the proposed project's annual and maximum electrical demand by the electricity provider, Pacific Gas and Electric (PG&E), has indicated that PG&E has adequate capacity and infrastructure to support the proposed project. Therefore, this impact would be less than significant.

Impact 4.18-C: Cumulative impacts related to energy conservation.

Implementation of mitigation would ensure that the proposed project construction activities would be conducted in a fuel-efficient manner. Idling times would be limited for construction equipment and vehicles to ensure that energy waste and inefficiency would be minimized. The cumulative use of energy resources during construction would be consistent with normal construction practices and would comply with efficiency- and conservation-related policies intended to address cumulative energy consumption statewide. Implementation of **Mitigation Measures 4.18-1** (**Construction Equipment and Vehicle Efficiency Plan**) and **4.10-1c** (**Idling Restrictions**) would reduce the cumulative impact to a less-than-significant level.

During project operation, the anticipated increase in electricity consumption for the proposed project would represent approximately 2 percent of Monterey County's annual usage, and an even smaller fraction of PG&E's overall service area usage. In the event that other cumulative projects listed in **Table 4.1-2** that would be high demand electricity users, such as the Monterey Bay Regional Water Project (DeepWater Desal, No. 34), which would require 25 times the amount of energy, request electrical service from PG&E, additional wholesale electric energy may need to be purchased by PG&E. This would be considered a significant impact. In addition, some reinforcement of the existing distribution system may also be required, but this would not substantially constrain local or regional energy supplies. However, the proposed project would have a less than significant contribution to this significant cumulative impact associated with the unnecessary, wasteful, or inefficient use of energy, or with energy supply, either at a local or regional level, during operation.

5.5.18.3 Direct and Indirect Effects of No Project Alternative

Under the No Project Alternative, no new facilities would be constructed or operated and the existing test slant well would be decommissioned Consequently, there would be no construction-related energy use associated with the No Project Alternative. Under the No Project Alternative, there would be less pumping from the Carmel River, resulting in a decrease in the use of energy.

Because the No Project Alternative would have no direct or indirect impacts with respect to energy conservation, it could not contribute to cumulative effects related to these topics.

5.5.18.4 Direct and Indirect Effects of Project Alternative 1 – Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.4.3). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**). Therefore, the impact analysis for Alternative 1 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 1.

Construction Effects

Construction of one additional slant well and 5.5 additional miles of source water pipeline would result in an increase in gasoline and diesel fuel use during construction (and decommissioning) compared to the proposed project. While the transportation and equipment energy use requirements would not be significant relative to the overall sales of transportation fuels in the County, activities could result in wasteful or inefficient use of energy if equipment is not well maintained, if equipment is left to idle when not in use, or if haul trips are not planned efficiently. The potential use of large amounts of fuel or energy in a wasteful or inefficient manner is considered a significant impact. However, with implementation of **Mitigation Measures 4.18-1** and **4.10-1b**, the impact would be reduced to a less-than-significant level. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational Effects

Long-term operation of Alternative 1 would result in approximately three times the electricity consumption to pump source water to the MPWSP Desalination Plant compared to the proposed project, resulting in an overall increase in electrical power demand and less efficient electricity consumption. However, the additional electricity required would not be a large amount compared to the existing energy supplies in the County and would be accommodated by existing local and regional energy supplies. The long-term consumption of fuel required for CalAm staff commute trips to and from the MPWSP Desalination Plant and vehicle trips associated with routine maintenance would be the same as the proposed project. Overall, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

Cumulative impacts associated with energy and energy conservation during construction and decommissioning would be the same as those described for the proposed project. Impacts would be significant and would have a cumulatively considerable contribution to significant cumulative impacts on the supply and/or availability of fuel sources. However, **Mitigation Measures 4.18-1** (**Construction Equipment and Vehicle Efficiency Plan**) and **4.10-1b** (**Idling Restrictions**) would be implemented to ensure construction activities would be conducted in a fuel-efficient manner. Even if construction were to occur simultaneously with other cumulative projects, the cumulative use of energy resources during construction would be consistent with normal construction practices and would comply with efficiency- and conservation-related policies intended to address cumulative energy consumption statewide after implementation of mitigation. Therefore, construction and decommissioning activities would have a significant contribution to a significant cumulative impact on the supply and/or availability of fuel sources; however, the incremental contribution would be reduced to less than significant with implementation of mitigation.

Although operation and maintenance would result in long-term consumption of substantial amounts of electricity, the anticipated increase in electricity consumption relative to baseline conditions for Alternative 1 would represent small percentages of Monterey County's annual usage and PG&E's overall service area usage. In the event that other cumulative projects request electrical service from PG&E, additional wholesale electric energy may need to be purchased by PG&E. For example, the increase in energy required to operate the DeepWater Desal Project's co-located data center (No. 34 in **Table 4.1-2** in Section 4.1) would be substantial; the efficiency of the data center and the associated cooling system is currently unknown and the impact would likely be significant and unavoidable. In addition, some reinforcement of the existing distribution system may be required for the DeepWater Desal Project. However, given the low electricity consumption that would be associated with Alternative 1, and because this energy use would be necessary for the production of desalinated water and therefore would not be unnecessary, wasteful, or inefficient, it would not have a significant contribution to the significant cumulative impact associated with potential unnecessary, wasteful, and/or inefficient use of energy, or with energy supply, either at a local or regional level, during operation and maintenance. Overall, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

5.5.18.5 Direct and Indirect Effects of Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a new, screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station on Dolan Road (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**). Therefore, the impact analysis of Alternative 2 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 2.

Construction Effects

Construction would result in a net increase of pipeline length of 6.5 miles resulting in an increase in gasoline and diesel fuel use during construction and decommissioning compared to the proposed project. While transportation and equipment energy use requirements would not be significant relative to total sales of transportation fuels in the County, construction and decommissioning activities could result in wasteful or inefficient use of energy. However, with implementation of **Mitigation Measures 4.18-1** and **4.10-1b,** the significant impact would be reduced to a less-than-significant level. Therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational Effects

Long-term operation of Alternative 2 would result in approximately three times the electricity consumption to pump source water to the MPWSP Desalination Plant compared to the proposed project, resulting in an overall increase in electrical power demand and less efficient electricity consumption. However, the additional electricity required would not be a large amount compared to the existing energy supplies in the County and would be accommodated by existing local and regional energy supplies. The long-term consumption of fuel required for CalAm staff commute trips to and from the MPWSP Desalination Plant and vehicle trips associated with routine maintenance would be the same as the proposed project. Overall, Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

Cumulative impacts associated with energy and energy conservation during construction, operation, maintenance, and decommissioning would be the same as those described for the proposed project. For the same reasons described for Alternative 1, Alternative 2 would have a cumulatively considerable contribution to a significant cumulative impact during construction and decommissioning; however, the incremental contribution would be reduced to a level that is less than significant with implementation of mitigation. Operation and maintenance would result in a less than significant contribution to the significant cumulative impact. Overall, Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

5.5.18.6 Direct and Indirect Effects of Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The pipelines for the intake and discharge systems would be installed using HDD. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the “Connection to CalAm” Point on **Figure 5.4-3**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**). Therefore, the impact analysis of Alternative 3 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 3.

Construction Effects

Construction of a new open water intake and a new outfall in Monterey Bay would require the use of marine construction equipment (e.g., barges) and HDD equipment; large equipment would also be required for the data center and associated cooling system. There would be an overall increase in the use of gasoline and diesel fuel compared to the proposed project. While the overall transportation and equipment energy use requirements would not likely be significant relative to total sales of transportation fuels in the County, construction and decommissioning activities could result in wasteful or inefficient use of energy if equipment is not well maintained, left to idle when not in use, or if haul trips are not planned efficiently resulting in a potentially significant impact. However, Implementation of **Mitigation Measures 4.18-1** and **4.10-1b**, would reduce impacts to a less-than-significant level. Therefore, Alternative 3 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational Effects

Operations and maintenance of the data center and cooling system would require 150 megawatts (MW) of electrical power) resulting in a substantial increase compared to the proposed project, which requires less than 6 MW. This energy demand would be 25 times the net energy demand of the proposed project, and represents approximately half of the County’s electricity usage in 2014 (PG&E, 2015). This additional energy load could substantially constrain local and/or regional energy supplies if not adequately addressed by PG&E. Alternative 3 would require its own

230 kilovolt (kV) electrical substation and electrical transmission facilities, including transmission lines, transmission towers, and underground circuits. Given this amount of electricity demand and new electrical infrastructure that would be required, it is assumed that implementation of this alternative would trigger PG&E's "large load process," which is designed to determine how PG&E customers with large energy requirements will be provided electricity.

With regard to electricity consumption, although the desalination plant portion of the alternative would include energy recovery and efficiency systems similar to the proposed project, the project applicant has not provided details on what, if any, energy efficiency measures would be achieved relative to the data center and cooling system. In addition, the electricity used would be less efficient given the longer distance to pump product water to CalAm's Monterey District service area compared the proposed project. Due to this uncertainty and the large amount of electrical demand that would be required relative to the existing demand in the County, it is assumed that the electricity-related impact would be significant and unavoidable. Therefore, Alternative 3 would have an ***increased impact conclusion*** compared to the proposed project, and impacts would be significant and unavoidable.

The long-term consumption of fuel that would be required for employee commute trips to and from the project site and vehicle trips associated with routine maintenance under Alternative 3 would also be substantially greater compared to the proposed project due the additional employees and facilities to maintain (see description of operational staffing and facilities maintenance in Section 5.4.5.3). Although substantially greater, Alternative 3 would not result in the inefficient or wasteful use of fuel and it would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

Cumulative impacts associated with energy and energy conservation during construction and decommissioning would be the same as those described for the proposed project. Alternative 3 would have a cumulatively considerable contribution to a significant cumulative impact on the supply and/or availability of fuel sources during construction and decommissioning; however, the incremental contribution would be reduced to less than significant with implementation of **Mitigation Measures 4.18-1** (**Construction Equipment and Vehicle Efficiency Plan**) and **4.10-1b** (**Idling Restrictions**) to ensure construction activities would be conducted in a fuel-efficient manner.

Operation and maintenance under Alternative 3 would result in long-term consumption of substantial amounts of electricity, which would represent a large amount of Monterey County's annual usage (e.g., electrical assumption under Alternative 3 would be equal to approximately half of all electricity consumed in Monterey County in 2014), and when combined with the energy demands of other cumulative projects, such as the Pure Water Monterey GWR Project (No. 59 in **Table 4.1-2** in Section 4.1), could substantially constrain local and/or regional energy supplies if not adequately addressed by PG&E. The project applicant has not provided details on what, if any, feasible mitigation could be implemented to reduce the contribution of Alternative 3 to below a significant level. Therefore, Alternative 3 would have a significant contribution to a significant and unavoidable cumulative impact associated with the unnecessary, wasteful, or inefficient use of energy, or with energy supply, either at a local or regional level, during operation. Overall, Alternative 3 would result in an ***increased impact conclusion*** compared to the proposed project, significant and unavoidable.

5.5.18.7 Direct and Indirect Effects of Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**). Therefore, the impact analysis of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4.

Construction Effects

Construction of Alternative 4 would require the use of marine construction equipment (e.g., barges) and HDD equipment for the new open-water intake and new outfall, and there would be an increase in gasoline and diesel fuel use compared to the proposed project resulting in a potentially significant impact. Implementation of **Mitigation Measures 4.18-1** and **4.10-1b** would reduce the significant impact to a less-than-significant level. Alternative 4 would have the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Operational Effects

Long-term operations of the People's Project would produce approximately 25 percent more product water that would require an approximately 25 percent increase in energy demand compared to the proposed project. In addition, the electricity used would be less efficient given the longer distance to pump product water to CalAm's Monterey District service area compared the proposed project. However, the additional electricity required would not be a large amount of energy compared to the energy supplies in the County and would be accommodated by the local and regional energy supplies. The long-term consumption of fuel required for worker commute trips and vehicle trips associated with routine maintenance would be the same as the proposed project. Overall, Alternative 4 would have the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

Cumulative impacts associated with energy and energy conservation during construction and decommissioning would be the same as those described for the proposed project. Alternative 4 would have a significant contribution to a significant cumulative impact on the supply and/or availability of fuel sources during construction and decommissioning; however, the incremental contribution would be reduced to less than significant with implementation of **Mitigation Measures 4.18-1** (**Construction Equipment and Vehicle Efficiency Plan**) and **4.10-1b** (**Idling Restrictions**) to ensure construction activities would be conducted in a fuel-efficient manner.

Although operation would result in long-term consumption of substantial amounts of electricity, the anticipated increase in electricity consumption for Alternative 4 would represent small percentages of Monterey County's annual usage and PG&E's overall service area usage. In the event that other cumulative projects, such as the DeepWater Desal Project (No. 34 in **Table 4.1-2** in Section 4.1) and GWR Project (No. 59), request electrical service from PG&E, additional wholesale electric energy may need to be purchased by PG&E. For example, the increase in energy required to operate the DeepWater Desal co-located data center would be significant; the efficiency of the data center and the associated cooling system is currently unknown and the impact would likely be significant and unavoidable. In addition, some reinforcement of the existing distribution system may also be required for the DeepWater Desal Project, but this would not substantially constrain local or regional energy supplies. For the same reasons described for Alternative 1, Alternative 4 would not have a considerable contribution to a significant cumulative impact associated with the unnecessary, wasteful, or inefficient use of energy, or with energy supply, either at a local or regional level, during operation and maintenance. Overall, Alternative 4 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

5.5.18.8 Direct and Indirect Effects of Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction Effects

The facilities that would be constructed under Alternative 5a would be the same as those constructed under the proposed project, but there would be three fewer slant wells than under the proposed project. There would be an overall decrease in gasoline and fuel use during construction under Alternative 5a compared to the proposed action. With implementation of **Mitigation Measures 4.18-1** and **4.10-1b,** the significant impact would be reduced to a less-than-significant level. Therefore, Alternative 5a would have the ***same impact conclusion*** as the proposed project, less than significant with mitigation. Alternative 5b would locate the slant wells at the Potrero Road parking lot, which would include construction of a 5.5 mile longer Source Water Pipeline. There would be an overall increase in gasoline and fuel use during construction of Alternative 5b compared to the proposed project and Alternative 5a. With implementation of **Mitigation Measures 4.18-1** and **4.10-1b** impacts would be reduced to less-than-significant levels. Therefore, Alternative 5b would have the ***same impact conclusion*** as the proposed project and Alternative 5a, less than significant with mitigation.

Operational Effects

As described above, Alternatives 5a and 5b would have a decreased desalinated plant capacity; therefore, the total operational electricity demand would be reduced compared to the proposed desalination plant; approximately 3.7 MW, which is equivalent to approximately 63 percent of that for the proposed project. Due to the increased length of the source water pipeline for Alternative 5b from Potrero Road to the Nashua Road/Highway 1 intersection, Alternative 5b would result in more than three times the energy demand to pump source water to the MPWSP Desalination Plant compared to proposed project. However, the overall energy demand associated with Alternatives 5a and 5b would be less than the proposed project given the lower source water volume required. Therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

Combined Impacts with GWR Project

Because Alternative 5 alone would not meet the project objectives and must be paired with the approved GWR Project (No. 59 in **Table 4.1-2** in Section 4.1) in order to do so, for informational purposes, this analysis provides the “subtotal” of the Alternative 5 impacts in combination with the impacts of the GWR Project. Similar to the proposed project, operation of Alternative 5 and the GWR Project would result in long-term consumption of electricity. The anticipated increase in electricity consumption would represent small percentages of Monterey County’s annual usage and PG&E’s overall service area usage. For example, the increase in energy required to operate the GWR Project (No. 59 in **Table 4.1-2** in Section 4.1) would be approximately 1.6 MW. When Alternative 5 is combined with the GWR Project, the total net increase in energy consumption would be approximately 5.3 MW. The energy efficiency of the structures and wells that would be associated with the GWR Project would be relatively high (PPWS, 2016). Given the low electricity consumption that would be associated with Alternative 5 combined with the GWR Project, and because this energy use would be necessary for the production of desalinated and recycled water and therefore would not be unnecessary, wasteful, or inefficient, these projects would not have a significant contribution to a significant cumulative impact associated with the unnecessary, wasteful, or inefficient use of energy, or with energy supply, either at a local or regional level, during operation and maintenance. This combined impact would have the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Impacts of Full Cumulative Scenario

Cumulative impacts associated with energy and energy conservation during construction and decommissioning would be similar to those described for the proposed project. Alternatives 5a and 5b would have a significant contribution to a significant cumulative impact on the supply and/or availability of fuel sources during construction and decommissioning; however, the incremental contribution would be reduced to less than significant with implementation of **Mitigation Measures 4.18-1** (**Construction Equipment and Vehicle Efficiency Plan**) and **4.10-1b** (**Idling Restrictions**) to ensure construction and decommissioning activities would be conducted in a fuel-efficient manner.

The overall anticipated increase in electricity consumption for projects in the cumulative scenario would represent small percentages of Monterey County's annual usage and PG&E's overall service area usage. For example, the net increase in energy required to operate the DeepWater Desal Project (No. 34) co-located data center would be approximately 150 MW. When Alternative 5, the GWR Project, and the DeepWater Desal Project are combined, the total net increase in energy consumption would be approximately 155 MW. The energy efficiency of the DeepWater Desal Project's data center and the associated cooling system is currently unknown and the cumulative impact would likely be significant and unavoidable. However, given the low electricity consumption that would be associated with Alternative 5 and the GWR Project, and because this energy use would be necessary for the production of desalinated water and therefore would not be unnecessary, wasteful, or inefficient, these projects would have a less than significant contribution to a significant cumulative impact associated with the unnecessary, wasteful, or inefficient use of energy, or with energy supply, either at a local or regional level, during operation and maintenance. Overall, Alternative 5 would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

5.5.18.9 References

Pacific Gas and Electric Company (PG&E), 2015. PG&E 2015 Corporate Responsibility and Sustainability Report. Available online at: http://www.pgecorp.com/corp_responsibility/reports/2015/. Accessed June 28, 2016.

Partners for Pure Water Solutions (PPWS), 2016. Monterey Regional Water Pollution Control Agency in partnership with Monterey Peninsula Water Management District. Consolidated Final Environmental Impact Report for the Pure Water Monterey Groundwater Replenishment Project, January, 2016. Pages 4.7-14 and 4.7-15.

5.5.19 Population and Housing

5.5.19.1 Setting/Affected Environment

The environmental setting/affected environment for the analysis of population and housing effects of the alternatives would be similar to that described for the MPWSP in Section 4.19, Population and Housing. The setting for the analysis of the direct growth inducing impacts of the alternatives is the same as the proposed project—the three county region consisting of Monterey, San Benito, and Santa Cruz counties. Indirect growth inducement is discussed below in Section 5.5.21. As described for the proposed MPWSP, there are no federal, state, or local regulations governing population and housing that would apply to the alternatives. Components of alternatives different from the proposed project and north of the Nashua Road/Highway 1 intersection would be located in unincorporated Monterey County, including the unincorporated community of Moss Landing.

5.5.19.2 Direct and Indirect Effects of Proposed Project (Slant Wells at CEMEX)

As described in detail in Chapter 3, Description of the Proposed Project, the proposed project (see **Figure 3-2**) would include construction of a desalination plant on 25 acres along Charles Benson Road northeast of the City of Marina that would include nine new subsurface slant wells at the CEMEX active mining area, and conversion of the existing test slant well to a permanent well. The proposed project would also include improvements to the existing Seaside Groundwater Basin aquifer storage and recovery (ASR) system, pump stations, storage tanks, and about 21 miles of new water conveyance pipelines. No construction or placement of facilities on the seafloor would occur.

The following paragraphs briefly summarize the impacts of the proposed project with respect to population and housing. The detailed impact analysis of the proposed project is provided in Section 4.19.

Impact 4.19-1: Induce substantial population growth directly during project construction.

The number of construction workers needed would vary, from 90 to 345, over the 24-month construction period. Concurrent construction of project components is expected to require from 300 to 345 workers during the peak four months of construction. Construction employment during the peak period (345 workers) represents 7 percent of the construction jobs in Monterey County in 2015 and 4 percent of the construction jobs in the three-county region comprising Monterey, Santa Cruz, and San Benito Counties in 2015. Given that MPWSP construction jobs would represent a minor percentage of the current local and regional construction employment levels, MPWSP construction is not expected to create employment opportunities substantially greater than would normally be available to construction workers in the area. Consequently, construction of the MPWSP would not induce population growth by attracting a substantial number of workers from outside the region to relocate to the area, and therefore would not create demand for additional housing or other facilities and services associated with growth.

The proposed project does not involve any housing construction and would not induce growth directly by constructing housing that would attract people to the area. Therefore, the proposed project would not directly induce a substantial increase in the local population and the direct growth-inducing impact of the proposed project would be less than significant.

Impact 4.19-2: Induce substantial population growth directly during project operations.

During MPWSP operations, approximately 25 to 30 facility operators and support personnel would operate the MPWSP Desalination Plant. All other proposed facilities would be operated remotely using Supervisory Control and Data Acquisition systems, with periodic visits by existing CalAm personnel. Conservatively assuming that the regional labor force could not meet the operational workforce requirements, up to 30 new employees relocating to the area would represent a 0.01 percent increase in workers residing in Monterey County (i.e., 0.01 percent of the labor force) in 2015. This incremental increase would not constitute substantial population growth in the region. Similarly, compared to the projected rate of growth of the county's labor force, an increase of 30 new employees would be minor. The county's labor force is projected to increase by 5,600 workers between 2010 and 2015; 30 new employees would represent 0.5 percent of this projected increase. Therefore, operation of the proposed project would not directly induce a substantial increase in the local population and the direct growth-inducing impact of the proposed project would be less than significant.

Impact 4.14-C: Cumulative impacts related to population and housing.

Because of the limited duration of construction jobs and the size of the regional construction workforce, there would be no significant cumulative impact on population and housing from construction of cumulative projects. Even if cumulative construction projects were to lead to population and housing effects by attracting some workers to move to the area, such moves would likely be temporary. In any event, the contribution of the MPWSP would be less than significant because of the relatively small number of construction workers required and the short duration of the construction period.

Because the population and housing that could be induced by operation of cumulative projects is expected to be consistent with growth anticipated in the counties' general plan documents, the cumulative impact during project operations would be less than significant. The MPWSP's operational workforce demands would be nominal: 25 to 30 people. Even in the unlikely event that the population and housing induced by operation of cumulative projects was significant, in no event would the proposed project make a significant contribution to any such effect.

5.5.19.3 Direct and Indirect Effects of No Project Alternative

The No Project Alternative would have no direct or indirect effects related to population or housing. It would not displace housing or people, because no facilities would be constructed, and would not induce workers or others to relocate from outside the area, because it would not provide jobs or housing. Because the No Project Alternative would have no direct or indirect impacts on population or housing, it could not contribute to cumulative effects related to these topics.

5.5.19.4 Direct and Indirect Effects of Project Alternative 1 – Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.4.3). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the additional 5.5 miles of source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**).

Construction Impacts

The direct growth-inducing impact of construction of Alternative 1 would be the same as the proposed project. Construction of the source water pipeline would take somewhat longer to build than the proposed MPWSP source water pipeline, due to the greater distance between the intake location and the desalination plant. However, as under the MPWSP, it is expected that construction workers would be drawn from the local and regional labor pool and the direct growth inducing impact would be less than significant. Therefore, Alternative 1 would result in the ***same impact conclusion*** compared to the proposed project, less than significant.

Operational and Facility Siting Impacts

The direct growth-inducing impact would be same as the proposed project because Alternative 1 would have the same workforce requirements. As described for the proposed project, existing plant workers would be retrained to operate the desalination plant or operators would be drawn from the local and regional labor pool. Components unique to this alternative would mostly be located underground and would not displace people or housing. Therefore, Alternative 1 would result in the ***same impact conclusion*** compared to the proposed project, less than significant.

Cumulative Analysis

Because Alternative 1 would have no impact related to the displacement of housing units or people, it would not cause or contribute to a cumulative impact associated with the displacement of housing or people that would necessitate the construction of replacement housing.

The geographic scope for the analysis of direct cumulative growth-inducing impacts during construction and operation of Alternative 1 is the three-county region consisting of Monterey, San Benito and Santa Cruz Counties. As described in the cumualtive impact analysis for the MPWSP, the cumulative analysis takes a projections-based approach based on the projected buildout of the general plans of the three counties.

Similar to the MPWSP, because of the temporary nature of construction jobs and the size of the regional construction workforce, it is expected that the construction workforce in Monterey, San Benito, and Santa Cruz Counties would meet labor demands associated with construction of

Alternative 1 and the cumulative projects. Therefore, there would be no significant cumulative impact on population and housing from construction of cumulative projects. Even if cumulative construction projects were to lead to population and housing effects by attracting some workers to move to the area from outside the region, such moves, and associated effects, would likely be temporary. Similar to the MPWSP, the contribution of Alternative 1 would not in any event be significant because of the small number of construction workers required and the short duration of the construction period. Therefore, the contribution of Alternative 1 construction would be less than significant.

As described for the MPWSP, workers in the region are expected to meet labor demands associated with operation of Alternative 1 and the cumulative projects due to the size of the regional work force, current unemployment rates in Monterey, San Benito, and Santa Cruz counties, and the size of the currently unemployed workforce. Similar to the proposed MPWSP, even if the population and housing effects induced by operation of cumulative projects were significant, Alternative 1 would not have a cumulatively significant contribution to any such effect due to the small operational workforce it would require.

5.5.19.5 Direct and Indirect Effects of Project Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water that originated from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to Castroville Community Services District would not be implemented. The open water intake system and the additional 6.5 miles of source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**).

Construction Impacts

For the same reasons stated above for Alternative 1, the direct growth-inducing impact of Alternative 2 construction would be of the same as the proposed project. Although this alternative may involve some workers with different construction skills, it is expected that, like the proposed project, workers having the requisite skills would be drawn from the local and regional labor pool, and impacts would be less than significant. Therefore, Alternative 2 would result in the same ***impact conclusion*** compared to the proposed project, less than significant.

Operational and Facility Siting Impacts

For the same reasons stated above for Alternative 1, the direct growth-inducing impact of Alternative 2 operations and facility siting would be the same as the proposed project. Components unique to this alternative, including the source water pipeline, intake system, and intake pump station, would be located underground, underwater, or in a previously disturbed industrial area and would not displace people or housing. Therefore, Alternative 2 would result in the same ***impact conclusion*** compared to the proposed project, less than significant.

Cumulative Analysis

Because Alternative 2 would have a less than significant impact related to the displacement of housing units or people it would not cause or contribute to a cumulative impact associated with the displacement of housing or people that would necessitate the construction of replacement housing.

For the same reasons stated above for Alternative 1, Alternative 2 would not have a significant contribution to a cumulative impact related to population and housing.

5.5.19.6 Direct and Indirect Effects of Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The pipelines for the intake and discharge systems would be installed using HDD. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the “Connection to CalAm” Point on **Figure 5.4-3**, ASR 5 and 6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water that originated from the Salinas Valley Groundwater Basin, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**).

Construction Impacts

The direct growth-inducing impact of Alternative 3 construction would be greater than the proposed project because it would involve considerably more construction. Further, this alternative would be designed to provide desalinated product water to other areas besides the

Monterey Peninsula, potentially including the city of Salinas and other areas in northern Monterey County and Santa Cruz County, and would, therefore, also include construction of product water pipelines to those areas. This alternative would require specialized construction skills different from those of the proposed project.

Although construction of this alternative would take longer than the proposed project and would involve a larger construction workforce, the substantial pool of construction workers in Monterey County and the three-county region would meet the demand for construction labor and the direct growth inducing impact of Alternative 3 would result in the ***same impact conclusion*** compared to the proposed project, less than significant.

Operational and Facility Siting Impacts

The direct growth-inducing impact of Alternative 3 operations would be greater than the proposed project because operations would require a substantially larger workforce due to the proposed data center. Alternative 3 components would be located underground, underwater, or within existing industrial areas and would have no impact related to the displacement of people or housing. According to information provided by the project proponent, the data center would require 20 regular employees for each shift, with three shifts per day, seven days per week, and that contracted staff and client visitors could add up to 20 additional people during any 8-hour shift, 10 of which are assumed to be contracted staff, bringing the total number of regular and contract employees to 30 each shift, or 90 employees per day. Assuming a five-day, 40-hour work week, staffing requirements would equal 90 full time employees during the work week and 36 full-time-equivalent employees for weekend shifts.[11] Thus, operation of the data center would require about 126 full-time-equivalent employees per week, and staffing needs for data center and desalination plant operations combined would total about 144 permanent workers, substantially greater than the 25 to 30 needed for the proposed project. As discussed under Impact 4.19-C in Section 4.19, Population and Housing, the three counties in the region have a substantial labor force and recent unemployment rates that exceeded the state and national average, suggesting the availability of workers to fill new jobs. The existing labor force would, therefore, be expected to meet a substantial portion of the labor demand associated with Alternative 3 operations. In addition, the Association of Monterey Bay Area Governments (AMBAG) projects that up to 64,000 jobs will be added in the three county region between 2010 and 2035. Therefore, the jobs provided by Alternative 3 would not exceed job growth anticipated for the region and while Alternative 3 would have an increased potential for direct growth inducing impacts it would result in the ***same impact conclusion*** compared to the proposed project, less than significant.

Cumulative Analysis

Because Alternative 3 would have no impact related to the displacement of housing units or people it would not cause or contribute to a cumulative impact associated with the displacement of housing or people that would necessitate the construction of replacement housing.

[11] This estimate of full-time-equivalent staff is based on 90 employees working 16 hours per week compared to a full time 40-hour work week.

For the same reasons stated above for Alternative 1, Alternative 3 would not have a significant contribution to a cumulative impact related to the construction workforce in Monterey, San Benito, and Santa Cruz Counties.

Similar to the MPWSP, it is expected that workers in the region would largely meet labor demand associated with operation of Alternative 3 and the cumulative projects, due to the size of the regional work force, current unemployment rates in Monterey, San Benito, and Santa Cruz counties, and the size of the currently unemployed workforce. Although this alternative would have a substantially larger operational workforce than the MPWSP, the number of jobs it would provide is less than 1 percent of the jobs AMBAG projects will be added in Monterey County between 2010 and 2020. Therefore, even if the population and housing induced by operation of cumulative projects were significant, Alternative 3 would not have a significant contribution to such an effect because of the small number of jobs it would provide relative to the unemployed labor force and anticipated job growth in the county. Therefore, the impact would be less than significant.

5.5.19.7 Direct and Indirect Effects of Alternative 4 – People's Moss Landing Water Desalination Project (People's Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water that originated from the Salinas Valley Groundwater Basin, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**).

Construction Impacts

For the same reasons as Alternative 3, the direct growth-inducing impact of Alternative 4 construction would be similar to that of the proposed project, with a much larger construction footprint. Construction of this alternative may take somewhat longer, involve a somewhat larger workforce, and include some workers with different construction skills. However, similar to the proposed project, it is expected that demand for construction labor would substantially be met by workers drawn from the local and regional labor pool, and the direct growth inducing impact would be less than significant. Therefore, Alternative 4 would result in the ***same impact conclusion*** compared to the proposed project, less than significant.

Operational and Facility Siting Impacts

The direct growth-inducing impact of Alternative 4 operations and facility siting would be similar to that of the proposed project because Alternative 4 would have similar workforce requirements that would be drawn from the local and regional labor pool, and impacts would be less than significant. Alternative 4 components, including the intake system, intake pump station, desalination plant, and product water pipeline, would be located underground, under water, or within existing industrial areas, and would not displace people or housing and there would be no impact. Therefore, Alternative 4 would result in the ***same impact conclusion*** compared to the proposed project, less than significant.

Cumulative Analysis

Because Alternative 4 would have no impact related to the displacement of housing units or people it would not cause or contribute to a cumulative impact associated with the displacement of housing or people that would necessitate the construction of replacement housing.

For the same reasons stated above for Alternative 1, Alternative 4 would not have a significant contribution to a significant cumulative impact related to population and housing.

5.5.19.8 Direct and Indirect Effects of Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Construction Impacts

The direct growth-inducing impact of Alternative 5a and 5b construction would be similar to that of the proposed project and Alternative 1, respectively. The construction period for the intake slant wells would be shorter than under the MPWSP because fewer wells would be constructed. The construction period for the smaller desalination plant may also be somewhat shorter, although this difference is expected to be minor because both the 9.6-mgd and 6.4-mgd plants would require the same basic components. As under the proposed project, it is expected that construction workers would be drawn from the local and regional labor pool, and therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** compared to the proposed project, less than significant.

Operational and Facility Siting Impacts

Workforce requirements for operation of Alternative 5a and 5b would be similar to those of the proposed project and Alternative 1, respectively; a small number of additional workers would be needed for operating the desalination plant. Similar to the proposed project, it is likely that existing plant operators would be retrained to operate the 6.4-mgd desalination facility, or operators would be drawn from the local and regional labor pool and the direct growth inducing impact would be less than significant. Like the proposed project, this alternative would have no impacts related to the displacement of housing or people because the desalination plant and other facilities would be sited at the same locations as the proposed project facilities, and would not displace housing or people. Therefore, Alternatives 5a and 5b would result in the ***same impact conclusion*** compared to the proposed project, less than significant.

Cumulative Analysis

Because Alternative 5a and 5b would have no impact related to the displacement of housing units or people it would not cause or contribute to a cumulative impact associated with the displacement of housing or people that would necessitate the construction of replacement housing.

For the same reasons stated above for Alternative 1, Alternative 5 would not have a significant contribution to a significant cumulative impact related to population and housing. Considered in combination with the impacts of the GWR Project (No. 59 in **Table 4.1-2** in Section 4.1), the construction and operational workforces would not be substantial in relation to the regional work force and current unemployment rates, and would not result in a significant contribution to a significant cumulative effect.

5.5.20 Socioeconomics and Environmental Justice

As described in Section 4.20, Socioeconomics and Environmental Justice, under NEPA, a federal lead agency must consider social and economic effects if they are related to a proposed project's natural or physical effects. Consequently, federal agencies must analyze a proposed project's economic and social impacts resulting from any natural or physical effects on the environment. Furthermore, Executive Order (EO) 12898 requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations.

As also described in Section 4.20, a CEQA Lead Agency may use information about the economic or social impacts of a project to determine the significance of physical changes caused by the project, but the economic or social effects of a project are not treated as significant effects on the environment. Additionally, CEQA does not use the term "environmental justice" or require the evaluation of impacts on minority or low-income communities in the way required by EO 12898. The ways in which disproportionate environmental burdens (e.g., on sensitive receptors) are addressed in this EIR/EIS are described in Section 4.20. Consistent with that discussion, significance determinations in this section do not apply to the CEQA analysis. Rather, the conclusions in this section are relevant only to the NEPA analysis of the proposed project and alternatives.

5.5.20.1 Setting/Affected Environment

Introduction

The socioeconomics and environmental justice setting/affected environment for alternatives would be similar to that described for the proposed project in Section 4.20, Socioeconomics and Environmental Justice. As is the case for the proposed project, each of the alternatives requires the evaluation of impacts on socioeconomic factors including regional employment and economics and specific effects on regionally important sectors like tourism, education, and research; and on environmental justice, which considers disproportionate environmental or human health impacts on minority and low-income communities. For all alternatives, potentially affected communities include the same as identified for the proposed project: Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, Seaside, Castroville, and Marina. This alternatives analysis describes one additional community: Moss Landing. Socioeconomic effects are by nature regionally influential. While the socioeconomic setting herein is presented on a community-level basis within Monterey County, it should be noted that residual impacts have the potential to occur in other nearby counties as well, such as San Benito and Santa Cruz. With the exception of Moss Landing, descriptions of the environmental setting and regulatory framework for all of the aforementioned communities are provided in Section 4.20 of this EIR/EIS.[12] The environmental setting relevant to Moss Landing is described below.

[12] Some information, including values pertaining to populations by category for regional places such as Monterey County and the State of California, is repeated from Section 4.20. This information is cited in Section 4.20.

Socioeconomics

Employment

Key employment data include the number of employable residents (i.e., the available labor force) and the number of job opportunities (i.e., employment) within a community. **Table 5.5-14** shows labor force and unemployment data for Moss Landing Census Designated Place (CDP), Monterey County, and the State of California (as cited in Section 4.20).

TABLE 5.5-14
LABOR FORCE AND UNEMPLOYMENT RATE FOR MOSS LANDING
(2015 ANNUAL AVERAGE)

Jurisdiction	Labor Force[a]	Unemployment Rate[b]
Moss Landing CDP[c]	200	23.4%
Monterey County	221,400	8.1%
State of California	19,100,900	5.4%

NOTES:
[a] EDD provides rounded labor force numbers, but calculates the unemployment rate before rounding.
[b] Not seasonally adjusted.
[c] Since Moss Landing is unincorporated, data shown are for Moss Landing CDP.

SOURCE: EDD, 2016

The Association of Monterey Bay Area Governments (AMBAG) does not provide data or estimates for unincorporated Moss Landing, and no other recent source of the estimated number of jobs in Moss Landing was identified. There are numerous marine research, industrial, recreational, retail, hospitality, and service industry employers in Moss Landing.

Regionally Important Economic Sectors

The Monterey County Board of Supervisors has adopted four economic “pillars” as potential opportunities for the County Economic Opportunity Committee to facilitate economic and employment growth: agriculture, tourism, education, and research (Monterey County, 2016). These sectors are relevant to the analysis on a regional basis (Monterey County), and are discussed in that capacity in Section 4.20.1.1. For more information about these sectors, please refer to that discussion.

Environmental Justice

Minority Populations

The methodology for identifying minority populations is explained in Section 4.20.1.2. The affected environment for this environmental justice analysis consists of the areas in Monterey County that would be affected by the alternatives. For this analysis, a city-level assessment was performed to identify potential minority and/or low-income populations qualifying as communities of concern. **Table 5.5-15** presents the minority population and percentage for the Moss Landing CDP, which is bordered by Jetty Road, Potrero Road, and Highway 1. Elkhorn Slough is located within the northern area of the community.

TABLE 5.5-15
MINORITY POPULATION OF MOSS LANDING (2010-2014)

Jurisdiction	Total Population	Minority Population[a]	Minority Population Percentage
Moss Landing CDP	200	163	81.5%

NOTES:
[a] Includes all individuals other than non-Hispanic white.

SOURCE: U.S. Census Bureau, 2014a

For the reasons described in Section 4.20.1.2, because Moss Landing CDP has a minority population greater than 50 percent, it is considered to be a community of concern for environmental justice. Note that because this information is derived from the 2010-2014 American Community Survey, and due to the small population size in Moss Landing, the small sample sizes on which survey results are based result in a large margin of error. The 2010 Decennial Census indicates that the minority population in Moss Landing in 2010 was just 32.4 percent (U.S. Census Bureau, 2010a). However, for consistency with the most recent available information used in Section 4.20, and as a conservative approach to identifying potential minority populations, Moss Landing is assumed to have a minority population greater than 50 percent for purposes of this analysis.

Low-Income Populations

This analysis uses two methods for identifying communities of concern related to income levels, based on two sets of guidelines: CEQ guidance and California Regional Water Management Guidelines. Both of these methods are described in detail in Section 4.20.1.2. **Table 5.5-16** presents the median household incomes and the percentages of residents with household incomes below the poverty level for Moss Landing. Based on the threshold described in Section 4.20.1.2, a community with 17.3 percent or greater of individuals with family incomes below the federal poverty threshold would be identified as a low-income population for the purposes of this analysis. Moss Landing has an estimated 12.5 percent of individuals with family incomes below the federal poverty threshold, and is therefore not considered a low-income population based on this measurement.

TABLE 5.5-16
INCOME CHARACTERISTICS FOR MOSS LANDING (2010-2014)

Location	Median Household Income	Individuals with Family Income Below Poverty Level
Moss Landing CDP	$30,500	12.5%

SOURCE: U.S. Census Bureau, 2014b.

As shown in **Table 4.20-4** in Section 4.20, the State of California's median household income as reported by the 2010-2014 American Community Survey was $61,489. Therefore, based on the threshold described in Section 4.20.1.2, communities within potentially affected areas of Monterey County with a median income of less than $49,191 would be considered disadvantaged communities. **Table 5.5-16** shows that as reported by the 2010-2014 American Community Survey, Moss Landing had a median income of less than $49,191. Therefore, Moss Landing is considered a "disadvantaged community" for purposes of this analysis. As noted above in the minority population discussion, the small sample sizes on which the American Community Survey results for Moss Landing are based result in a large margin of error. The Decennial Census does not report household income; however, past American Community Surveys have reported median household income for Moss Landing as high as $87,000 (U.S. Census Bureau, 2010b). For consistency with the most recent available information used in Section 4.20, and as a conservative approach to identifying potential minority populations, Moss Landing is assumed to be a disadvantaged community for purposes of this analysis.

Regulatory Framework

For Federal, State, and Local Regulations relevant to the community of Moss Landing, see Sections 4.20.2.1 through 4.20.2.3.

5.5.20.2 Direct and Indirect Effects of the Proposed Project -- Slant Wells at CEMEX

Impact 4.20-1: Reductions in the rate of employment, total income, or business activity in Monterey County.

MPWSP construction activities and spending would result in temporary new local employment opportunities and increased spending on construction materials, equipment, and services. The proposed project would result in a direct, minor, beneficial economic impact on the Monterey County economy. Secondary economic effects could also result from subsequent "re-spending" by construction companies and materials suppliers that occurs when these companies spend their earnings from the projects at other businesses (i.e., a multiplier effect), and re-spending by employees of those companies.

Construction of the proposed project would not have adverse effects on the tourism, research, and education industries in Monterey County. Access for tourists to businesses or recreation may be temporarily impacted by pipeline construction, but implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), would reduce potentially significant impacts to a less-than-significant level.

The rate increase associated with the proposed project could represent an adverse economic impact on the spending power of some ratepayers in Monterey District, but would not be large enough to constitute a significant adverse effect on overall employment or business activity in Monterey County.

Operation of the proposed project would not affect access to tourism, education and research industries. Tourism relies on the recreation, retail and travel sectors, and would not be impacted by the proposed project. Overall, the impacts of operation would be less than significant.

Impact 4.20-2: Disproportionately high and adverse effects on low-income or minority populations.

Low-income and minority populations include all or portions of Sand City, Seaside, Castroville, Monterey (downtown), and Marina. Although several minority and low-income communities would experience higher emissions than would other communities (due to the amount of construction contributing to the estimate of maximum daily emissions near each community), emissions from construction would not result in substantial adverse health effects because they would be temporary and would not exceed applicable thresholds. Therefore, the project would not result in a disproportionately high and adverse impact on minority and/or low-income communities, and the impact would be less than significant. Additionally, implementation of **Mitigation Measures 4.10-1a** through **4.10-1d** would reduce project construction emissions further.

Combined operational emissions near minority and low-income populations would not exceed any of the thresholds derived from applicable air quality plans; therefore, operational emissions would not be expected to adversely affect the communities' health. In addition, the proposed project would result in higher water rates for most ratepayers in the district served by the project, including low-income populations in Sand City, Seaside, and downtown Monterey. Such increases could have an adverse impact on low-income communities which could be disproportionately high, and thus significant. However, CalAm's low-income assistance and water conservation assistance programs would reduce the burden of increased prices on low-income households in the Monterey District to the extent practicable. In addition, California Public Utility Commission oversight includes provisions for implementing the lowest possible rate for service consistent with reliable and safe service levels for residential and small commercial customers, in particular. Therefore, this impact would be less than significant.

CCSD serves Castroville, a minority and low-income community outside of CalAm's Monterey District. The proposed project would provide a minor beneficial effect for this community since the CCSD would receive higher quality water via the Castroville Pipeline than the current supply from groundwater pumping in the Salinas Valley Groundwater Basin.

Impact 4.20-C: Cumulative impacts related to socioeconomics and environmental justice.

The proposed project would have a net positive contribution to cumulative impacts related to economic and employment effects on communities benefitting from proposed project construction and operation. The proposed project's contribution to cumulative impacts related to localized emissions during construction and operation would be less than significant. The proposed project would not contribute to a cumulative impact related to long-term increases in water rates for ratepayers.

5.5.20.3 Direct and Indirect Effects of the No Project Alternative

Under the No Project Alternative, it would not be possible to meet the proposed project objectives, and reliance on existing and planned water conservation and recycling programs would continue. Because no new facilities would be constructed but the test slant well would be decommissioned, short-term construction impacts (including construction air quality effects) on the health of environmental justice communities identified in Section 4.20 would be minimal. This alternative would not provide the local and regional economic benefits of project construction. No temporary new local employment opportunities or increased spending on construction materials, equipment, and services would occur. The State Revolving Fund debt and public financing would not be implemented under the No Project Alternative and, therefore, any short-term economic benefit potentially offered by low-cost financing would not occur. Employment, important economic sectors, and minority and low-income communities would not experience adverse short-term construction-related impacts.

Regarding long-term impacts, the lack of water supply would adversely affect the region's economic vitality. The reduction of available water supply by almost 40 percent could lead to water shortages throughout the CalAm Monterey District service area, impacting all economic sectors, including the County's "four pillars" – agriculture, tourism, education, and research, by substantially reducing the reliability of water resources and water infrastructure.

As described in Section 5.4.2, it is assumed that the limited amount of available supplies under the No Project Alternative would trigger Stage 3 Conservation Rates, and possibly Stage 4 Rationing Measures, under MPWMD's 2016 Monterey Peninsula Water Conservation and Rationing Plan (Conservation and Rationing Plan) (MPWMD, 2016). The subsections below describe the economic impacts of each stage of conservation and rationing.

Stage 3, Conservation Rates

Within CalAm's Monterey District, two conservation water rate increases would occur, as described in the Conservation and Rationing Plan. Under Level 1 Conservation Rates, a 25 percent surcharge would be implemented on existing rates for a minimum of 3 months. If Stage 3 has not been lifted after 3 months, Level 2 Conservation Rates would increase the surcharge to 40 percent. These surcharges would not apply to Tier 1 Residential water use, the first tier in the water rate structure. However, for residences using more than their Tier 1 amount, and for all businesses, these surcharges would increase monthly water costs while Stage 3 Conservation Rates are in place, potentially resulting in adverse economic impacts as customers would have less available for spending on other types of purchases. Additionally, these surcharges could disproportionately affect low-income populations within the Monterey District (i.e., Sand City, Seaside, and downtown Monterey) because the increase in water costs as a result of the surcharges may be disproportionately high relative to their incomes compared to non-low-income populations.

Stage 4, Rationing Measures

Stage 4 would take effect if Stage 3 is deemed unsuccessful after 8 months, or if directed by a governmental or regulatory agency. Under Stage 4, mandatory reductions resulting in water rationing and additional prohibitions would be implemented. Residential rations would consist of incremental allowances based on persons per household, and additional allowances could only be granted through completion and approval of an application. Non-residential water rations would also be implemented if residential water rationing does not achieve measurable results as expected after a period of 6 months. Additional rationing measures could include prohibition of non-essential water uses, a moratorium on accepting water permit applications, no new temporary or permanent potable water service, suspension of annexations to CalAm's service area, ending the use of portable water meters or hydrant water meters, restrictions on draining and refilling of swimming pools, and restrictions on watering and irrigating.

Under Stage 4, the regional economy would experience adverse economic impacts in important sectors such as agriculture, tourism and hospitality, education, and research. While businesses that require water in the course of their business practice, such as laundromats or nurseries, would be exempt from non-residential rationing, non-exempt businesses in several economic sectors would experience the adverse effects of rationing. Restaurants, hotels, and other establishments in the tourism and hospitality industry would be required to cut back on landscaping and change their amenities to accommodate restrictions. Manufacturing activities, commercial farms, and research facilities depend on water for operations and maintenance. The restrictions on new connections would slow or halt economic development as new residences, commercial projects, or industrial facilities could not procure water sources and therefore would not be permitted or built. This would result in a loss in employment opportunities and in commercial property values.

Also at Stage 4, all non-exempt residential customers would experience enforced water rationing. This could adversely affect residential property values in the Monterey District, resulting in economic loss to current residents. While no formal economic modeling has been conducted to quantify these economic effects, stakeholders have recognized the economic and public health implications of the water supply shortage under the No Project Alternative. As quoted in the CDO, the Monterey County Hospitality Association contends that "A marked substantial reduction in the quantity of water …would, in all likelihood, affect the number of visitors that can be served by the hospitality industry and the economy of the area" (SWRCB, 2009). The MPWMD echoes the same sentiment in a 2009 letter that states that imposing a moratorium (as included under Stage 4, Rationing Measures) "would force further economic stagnation upon the region, and can result in harm to the health and safety of the community" (MPWMD, 2009). Impacts of Stage 3 conservation and Stage 4 rationing measures on the rate of employment, total income, or business activity in Monterey County, as well as on low-income populations, would be significant, and no feasible mitigation is available to reduce these impacts to less than significant. Therefore, socioeconomic and environmental justice impacts of the No Project Alternative would be significant and unavoidable.

In summary, with respect to reductions in the rate of employment, total income, or business activity in Monterey County, the No Project Alternative would result in an ***increased impact conclusion*** compared to the project as a result of implementation of Stage 3 conservation and Stage 4 rationing measures; significant and unavoidable. With respect to disproportionately high and adverse effects on low-income or minority populations, the No Project Alternative would avoid construction impacts on these populations, but would nonetheless result in an ***increased impact conclusion*** compared to the project as a result of implementation of Stage 3 conservation and Stage 4 rationing measures and their potential to cause disproportionately high and adverse economic effects on low-income populations; significant and unavoidable.

As described in Section 5.4. 2, the GWR Project (No. 59 in **Table 4.1-2**) would supply some water to CalAm to serve the Monterey District, but would not supply enough to avoid the need for above-described conservation and rationing measures. In addition to the significant and unavoidable impact the No Project Alternative would cause with respect to reductions in the rate of employment, total income, or business activity in Monterey County, the GWR Project would cause rates to increase in the Monterey District, resulting in a potentially significant cumulative economic impact.

5.5.20.4 Direct and Indirect Effects of Project Alternative 1 – Slant Wells at Potrero Road

Alternative 1 would supply water to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using the same type of subsurface intake system as the proposed project, but at a different location (described in Section 5.4.3). The desalination plant, brine discharge pipeline, Castroville Pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. The location of the slant wells at Potrero Road and the longer source water pipeline are the components unique to Alternative 1 (see **Figure 5.4-1**). Therefore, the analysis of socioeconomic and environmental justice impacts of Alternative 1 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 1.

Socioeconomics

Compared to the proposed project, the type and intensity of Alternative 1 socioeconomic impacts would be the same. In the community of Moss Landing, where the intake facilities would be constructed at Potrero Road, some localized re-spending effects could occur if temporary construction workers spend some of their earnings near the Potrero Road site (e.g., on lunches, gasoline, etc.). Like the proposed project, construction of Alternative 1 would have a direct, minor, beneficial economic impact on the Monterey County economy and potentially in nearby counties such as San Benito and Santa Cruz counties.

For the same reasons described in Section 4.20.5.1, construction of Alternative 1 components that are the same as the proposed project would not have adverse effects on the tourism, research, and education industries in Monterey County. Potentially significant impacts related to disrupted access to local businesses would be similar to those described for the proposed project and would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**).

No offshore construction is proposed and construction of the Alternative 1 components would not interfere with any research or tourism activities being conducted along the coast. No monitoring activities were identified as occurring close enough to proposed construction for these activities to be affected (SIMoN, 2016). No impacts on educational facilities would occur.

Operation and maintenance of Alternative 1 would result in the same minimal impacts on socioeconomics as the proposed project, as described in Section 4.20. The same long-term increase in future water prices for water consumers described in Section 4.20.5.1 would occur.

Overall, Alternative 1 would result in the ***same impact conclusion*** as the proposed project with respect to impacts on the rate of employment ant total income and business activity in Monterey County, less than significant with mitigation.

Environmental Justice

Impacts from the components that are common with the proposed project would be identical to those described in Section 4.20.5.2. Health effects resulting from decreased air quality from construction would be location-specific. As a result of the different location of the slant wells and source water pipeline, construction emissions associated with these components would occur in Moss Landing, which is identified as a minority population and disadvantaged community. However, construction emissions would be reduced in Marina, which is also an identified minority and low-income population, because only the new Desalinated Water Pipeline and a smaller portion of the alternative source water pipeline would be constructed near Marina. As described in Section 4.20.5.2, the emissions from these components would not result in substantial adverse health effects because they would be temporary and would not exceed applicable thresholds. Therefore, because construction of Alternative 1 components would not result in substantial adverse effects, this alternative would not result in a disproportionately high and adverse impact on minority and/or low-income communities, and the impact of Alternative 1 construction would be less than significant. Additionally, implementation of **Mitigation Measures 4.10-1a** through **4.10-1d** would reduce project construction emissions further; however, the impact would be less than significant regardless.

During operation the same long-term increase in future water prices for water consumers described in Section 4.20.5.1 would occur. Castroville, a disadvantaged community, would experience minor beneficial effects from Alternative 1 in the same way it would under the proposed project, as described in Section 4.20.5.1.

Overall, Alternative 1 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

The geographic scope for the cumulative impact analysis of socioeconomics is the same as that described for the proposed project, plus the additional community of Moss Landing. The contributions of Alternative 1 to cumulative socioeconomic impacts also would be similar to those of the proposed project described in Impact 4.20-C. No communities in the vicinity of Alternative 1 would experience negative socioeconomic impacts resulting from construction. Access for consumers to some businesses may be temporarily affected, which may result in a significant impact on business activity, but implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), would minimize the influence of such effects on the tourism industry, reducing them to a less-than-significant level, and no other projects in the cumulative scenario are likely to overlap in time and location with these potential disruptions. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to socioeconomics, less than significant with mitigation.

The geographic scope for the cumulative impact analysis of environmental justice includes the minority and low-income populations identified in **Tables 4.20-4** and **4.20-5** (i.e., Seaside, Marina, Castroville, and Sand City, and one census tract in downtown Monterey), plus the additional community of Moss Landing, identified as a minority population and disadvantaged community. The contributions of Alternative 1 to cumulative environmental justice impacts would be similar to those identified in Impact 4.20-C for the proposed project, except that Alternative 1 would result in less construction in and near Marina, reducing project-specific localized air pollution near that community, but would instead move construction of the subsurface slant wells and source water pipeline near the Moss Landing community. When combined with other construction projects listed in **Table 4.1-2** in Section 4.1, including one additional project that may have the potential to result in overlapping air quality impacts – the DeepWater Desal Project (No. 34) – the cumulative localized emissions could be increased compared to Alternative 1 alone. Although cumulative impacts could be significant if other projects resulted in emissions that exceeded significance thresholds, the localized emissions of Alternative 1 components would not be significant. Therefore, for the same reasons described in the air quality analysis in Section 4.10.6, the contribution of Alternative 1 to cumulative impacts at these locations would be less than significant. With regard to operational effects, such emissions would be negligible. Alternative 1 would have the same potential contribution to rate increases in CalAm's Monterey District, and the cumulative scenario affecting rates would be identical to that described for the proposed project. Therefore, Alternative 1 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to environmental justice, less than significant.

5.5.20.5 Direct and Indirect Effects of Project Alternative 2 – Open-Water Intake at Moss Landing

Alternative 2 would supply seawater to the proposed 9.6 mgd desalination plant located at the Charles Benson Road site using a screened open-water intake system consisting of an intake structure located offshore in MBNMS and southwest of the Moss Landing Harbor entrance, a subsurface intake pipeline, and an intake pump station (described in Section 5.4.4). The desalination plant, brine discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR components, Highway 68 interconnection improvements, and the Carmel Valley Pump Station would be identical to the proposed project described in Chapter 3, Description of the Proposed Project. Because the open water intake would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the Castroville Pipeline, the Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The open water intake system in Moss Landing and the longer source water pipeline are the components unique to Alternative 2 (see **Figure 5.4-2**). Therefore, the analysis of socioeconomic and environmental justice impacts of Alternative 2 focuses primarily on the locations for the intake system and source water pipelines that are different from the proposed project; however, impact conclusions are made for the whole of Alternative 2.

Socioeconomics

The type and intensity of Alternative 2 socioeconomic impacts would be similar to the proposed project, except for in the community of Moss Landing where the intake facilities would be constructed, where some localized re-spending effects could occur if temporary construction workers spend some of their earnings near the Potrero Road site (e.g., on lunches, gasoline, etc.). Like the proposed project, construction of Alternative 2 would have a direct, minor, beneficial economic impact on the Monterey County economy and potentially in nearby counties such as San Benito and Santa Cruz counties.

For the same reasons described in Section 4.20.5.1, construction of Alternative 2 would not have adverse effects on the tourism, research, and education industries in Monterey County. Potentially significant impacts related to disrupted access to local businesses would be similar to those described for the proposed project and would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**).

Offshore construction of the open-water intake facility would not interfere with any research activities being conducted along the coast. No impacts on educational facilities would occur.

Operation and maintenance of Alternative 2 would result in the same minimal impacts on socioeconomics as the proposed project, as described in Section 4.20. The same long-term increase in future water prices for water consumers described in Section 4.20.5.1 would occur.

Overall, Alternative 2 would result in the ***same impact conclusion*** as the proposed project with respect to impacts on the rate of employment ant total income and business activity in Monterey County, less than significant with mitigation.

Environmental Justice

Health effects resulting from decreased air quality from construction would be location-specific. Impacts from the components that are common with the proposed project would be identical to those described in Section 4.20.5.2. As a result of the different location of the intake and source water pipeline, construction emissions associated with these components would occur in Moss Landing, which is identified as a minority population and disadvantaged community. However, construction emissions would be reduced in Marina, which is also an identified minority and low-income population, because only the new Desalinated Water Pipeline and a smaller portion of the alternative source water pipeline would be constructed near Marina. Additionally, emissions would be reduced near Castroville, a disadvantaged community. Emissions from Alternative 2 components would not result in substantial adverse health effects because they would be temporary and would not exceed applicable thresholds. Therefore, because construction of Alternative 2 components would not result in substantial adverse effects, this alternative would not result in a disproportionately high and adverse impact on minority and/or low-income communities, and the impact of Alternative 2 construction would be less than significant. Additionally, implementation of **Mitigation Measures 4.10-1a** through **4.10-1d** would reduce project construction emissions further; however, the impact would be less than significant regardless.

During operation, a long-term increase in future water prices for water consumers would occur; however, the extent of the increase is not yet known. Castroville, a disadvantaged community, would not experience the minor benefit related to improved water quality from Alternative 2 in the same way it would under the proposed project, as described in Section 4.20.5.1, because Alternative 2 would not return water to the CCSD.

Overall, Alternative 2 would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

The geographic scope for the cumulative impact analysis of socioeconomics is the same as that described for the proposed project, plus the additional community of Moss Landing. The contributions of Alternative 2 to cumulative socioeconomic impacts also would be similar to those of the proposed project described in Impact 4.20-C. No communities in the vicinity of Alternative 2 would experience negative socioeconomic impacts resulting from construction. Access for consumers to some businesses may be temporarily affected, which may result in a significant impact on business activity, but implementation of **Mitigation Measure 4.9-1**, Traffic Control and Safety Assurance Plan, would minimize the influence of such effects on the tourism industry, reducing them to a less-than-significant level, and no other projects in the cumulative scenario are likely to overlap in time and location with these potential disruptions. Therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to socioeconomics, less than significant with mitigation.

The geographic scope for the cumulative impact analysis of environmental justice includes the minority and low-income populations identified in **Tables 4.20-4** and **4.20-5** (i.e., Seaside, Marina, Castroville, and Sand City, and one census tract in downtown Monterey), plus the additional community of Moss Landing, identified as a minority population and disadvantaged community. The contributions of Alternative 2 to cumulative environmental justice impacts would be similar to those identified in Impact 4.20-C for the proposed project, except that Alternative 2 would result in less construction in and near Marina and Castroville, reducing project-specific localized air pollution near those communities, but would result in more construction near the Moss Landing community as a result of the open water intake and alternative source water pipeline construction. When combined with other construction projects listed in **Table 4.1-2** in Section 4.1, including two additional projects that may have the potential to result in overlapping air quality impacts – the DeepWater Desal Project (No. 34) and the specific construction projects in the Moss Landing Community Plan (No. 37) – the cumulative localized emissions could be increased compared to Alternative 2 alone. Although cumulative impacts could be significant if other projects resulted in emissions that exceeded significance thresholds, the localized emissions of Alternative 2 components would not be significant. Therefore, for the same reasons described in the air quality analysis in Section 4.10.6, the contribution of Alternative 2 to cumulative impacts at these locations would be less than significant. With regard to operational effects, such emissions would be negligible. Alternative 2 would have the same potential contribution to rate increases in CalAm's Monterey District, and the cumulative scenario affecting rates would be identical to that described for the proposed project. Therefore, Alternative 2 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to environmental justice, less than significant.

5.5.20.6 Direct and Indirect Effects of Project Alternative 3 – Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)

Alternative 3 includes the construction and operation of a screened open ocean intake system and a brine discharge system located on the seafloor in Monterey Bay within MBNMS, subsurface pipelines connecting to these intake and discharge systems, a seawater desalination facility and co-located data center, and associated components to provide up to 25,000 afy of potable water and data transmission and storage services. The alternative would also include 6.5 miles of desalinated water pipeline to connect with the CalAm system and up to an additional 25 miles of pipelines to convey the desalinated water to other areas (total of 31.5 miles of additional pipeline). Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-3**, ASR 5 and 6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant and data center, open water intake system, brine discharge system, and the additional 31.5 miles of desalinated water pipeline are the components unique to Alternative 3 (see **Figure 5.4-3**). Therefore, the analysis of socioeconomic and environmental justice impacts of Alternative 3 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 3.

Socioeconomics

The type of socioeconomic impacts under Alternative 3 would be similar to the proposed project, except that most construction would occur in the community of Moss Landing. Construction would result in the same types of re-spending effects in Moss Landing as described for the proposed project, though increased because a larger workforce would be present in Moss Landing during construction of Alternative 3. Like the proposed project, construction of Alternative 3 would have a direct, minor, beneficial economic impact on the Monterey County economy and potentially in nearby counties such as San Benito and Santa Cruz counties.

For the same reasons described in Section 4.20.5.1, construction of Alternative 3 would not have adverse effects on the tourism, research, and education industries in Monterey County. Potentially significant impacts related to disrupted access to local businesses would be similar to those described for the proposed project and would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**).

Offshore construction of the open ocean intake facility would not interfere with any research activities being conducted along the coast. No impacts on educational facilities would occur.

Operation and maintenance of Alternative 3 would result in the same types of minimal impacts on socioeconomics as the proposed project, as described in Section 4.20, though impacts related to operation and maintenance of the desalination plant would occur closer to Moss Landing. Approximately the same long-term increase in future water prices for water consumers described in Section 4.20.5.1 would occur, with the potential for some variance based on the cost to CalAm to procure water from the Alternative 3 desalination plant. Future water prices for water consumers have not yet been determined for this alternative and will be evaluated in the EIR/EIS being compiled for the DeepWater Desal Project.

Overall, Alternative 3 would result in the ***same impact conclusion*** as the proposed project with respect to impacts on the rate of employment ant total income and business activity in Monterey County, less than significant with mitigation.

Environmental Justice

Health effects resulting from decreased air quality from construction would be location-specific. Impacts from the components that are common with the proposed project would be identical to those described in Section 4.20.5.2. Emissions would be reduced near Marina and Castroville. However, construction emissions associated with the desalination plant, data center, intake and discharge systems, and related facilities would be greater than the emissions related to the proposed project desalination plant due to the increased number of concurrent construction efforts in the same general location, and these facilities would be located near Moss Landing, an identified minority population and disadvantaged community. As described in Section 5.5.10.6, it is not currently known how construction of these facilities would proceed; however, if the data center and/or cooling system were constructed concurrently with the desalination facility, the combined daily emissions of these facilities near Moss Landing would exceed the MBUAPCD threshold for PM_{10} emissions. Unlike the proposed project, this impact would be significant and unavoidable even with implementation of **Mitigation Measures 4.10-1a** through **4.10-1d**. Therefore, the Alternative 3 construction-related impact would be significant and unavoidable, even with mitigation.

Operation and maintenance of Alternative 3 could result in a significant health risk associated with testing and exercising the emergency generators. This impact would occur near Moss Landing, and thus could have a disproportionately high and adverse impact on this community if the health risk were significant. However, as described in Section 5.5.10.6, the associated impact would not be significant if the generators were sited on the north side of the property away from the nearest residences. To ensure that the operational health risk impact would be reduced to a less-than-significant level, implementation of **Mitigation Measure ALT 3-AQ** in Section 5.5.10.6 would be required. Therefore, operation of Alternative 3 would result in an increased level of impact on sensitive receptors compared to the proposed project and would be less than significant with mitigation.

Castroville, a disadvantaged community, would not experience the minor benefit related to improved water quality from Alternative 3 in the same way it would under the proposed project, as described in Section 4.20.5.1, because Alternative 3 would not return water to the Castroville Community Services District.

Overall, Alternative 3 would result in an ***increased impact conclusion*** compared to the proposed project, significant and unavoidable.

Cumulative Analysis

The geographic scope for the cumulative impact analysis of socioeconomics is the same as that described for the proposed project, plus the additional community of Moss Landing. The contributions of Alternative 3 to cumulative socioeconomic impacts also would be similar to those of the proposed project described in Impact 4.20-C. No communities in the vicinity of Alternative 3 would experience negative socioeconomic impacts resulting from construction. Access for consumers to some businesses may be temporarily affected, which may result in a significant impact on business activity, but implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**), would minimize the influence of such effects on the tourism industry, reducing them to a less-than-significant level, and no other projects in the cumulative scenario are likely to overlap in time and location with these potential disruptions. Therefore, Alternative 3 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to socioeconomics, less than significant with mitigation.

The geographic scope for the cumulative impact analysis of environmental justice includes the minority and low-income populations identified in **Tables 4.20-4** and **4.20-5** (i.e., Seaside, Marina, Castroville, and Sand City, and one census tract in downtown Monterey), plus the additional community of Moss Landing, identified as a minority population and disadvantaged community. The contributions of the components common to the proposed project and Alternative 3 (i.e., the pipelines south of the “Connection to CalAm” point, the ASR system, and the Carmel Valley Pump Station) to cumulative environmental justice impacts would be similarly minimal compared to those identified in Impact 4.20-C for the proposed project. Alternative 3 would result in less construction in and near Marina and Castroville, reducing but not eliminating localized air pollution near those communities. However, Alternative 3 would result substantial construction activity near the Moss Landing community as a result of construction of the desalination plant, data center, substation, intake and discharge systems, and related facilities in that location. As described above, this impact would be significant and unavoidable even with implementation of **Mitigation Measures 4.10-1a** through **4.10-1d**. When combined with other construction projects listed in **Table 4.1-2** in Section 4.1, including one additional project that may have the potential to result in overlapping air quality impacts – the Moss Landing Community Plan (No. 37) – the cumulative localized emissions could be increased compared to Alternative 3 alone. If overlapping construction were to occur, Alternative 3 would result in a significant contribution to a significant cumulative impact. This would be an ***increased level of impact*** compared to the proposed project, significant and unavoidable, even with mitigation.

5.5.20.7 Direct and Indirect Effects of Project Alternative 4 – People’s Moss Landing Water Desalination Project (People’s Project)

Alternative 4 includes the construction and operation of an open ocean intake, a brine discharge system and pipelines, and supporting ballast rock located on the seafloor in Monterey Bay within MBNMS, as well as a 12 mgd desalination plant and associated facilities to provide 13,400 afy of water supply to meet the current and future needs of the Monterey Peninsula. Several components would be identical to the proposed project: the new Transmission Main, new desalinated water pipeline south of the "Connection to CalAm" Point on **Figure 5.4-4**, ASR-5 and -6 wells and ASR pipeline, Highway 68 interconnection improvements, and Carmel Valley Pump Station would be as described in Chapter 3, Description of the Proposed Project. Because this alternative would have an open water intake that would eliminate the need for returning source water drawn from the Salinas Valley Groundwater Basin, the proposed project Castroville Pipeline, Pipeline to CSIP Pond, and operational components related to delivering water to CCSD would not be implemented. The desalination plant, open water intake system, brine discharge system, and the additional 6.5 miles of desalinated water pipeline are the components unique to Alternative 4 (see **Figure 5.4-4**). Therefore, the analysis of socioeconomic and environmental justice impacts of Alternative 4 focuses primarily on these components; however, impact conclusions are made for the whole of Alternative 4.

Socioeconomics

The type of socioeconomic impacts under Alternative 4 would be similar to the proposed project, except that most construction would occur in the community of Moss Landing. Construction would result in the same types of re-spending effects in Moss Landing as described for the proposed project, though increased because a larger workforce would be present in Moss Landing during construction of Alternative 4. Like the proposed project, construction of Alternative 4 would have a direct, minor, beneficial economic impact on the Monterey County economy and potentially in nearby counties such as San Benito and Santa Cruz counties.

For the same reasons described in Section 4.20.5.1, construction of Alternative 4 components that are the same as the proposed project would not have adverse effects on the tourism, research, and education industries in Monterey County. Potentially significant impacts related to disrupted access to local businesses would be similar to those described for the proposed project and would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.9-1** (**Traffic Control and Safety Assurance Plan**).

Offshore construction of the open-water intake facility would not interfere with any research activities being conducted along the coast. No impacts on educational facilities would occur.

Operation and maintenance of Alternative 4 would result in the same types of minimal impacts on socioeconomics as the proposed project, as described in Section 4.20, though impacts related to operation and maintenance of the desalination plant would occur closer to Moss Landing. Approximately the same long-term increase in future water prices for water consumers described in Section 4.20.5.1 would occur, with the potential for some variance based on the cost to CalAm to procure water from the Alternative 4 desalination plant. Future water prices for water consumers have not yet been determined for this alternative.

Overall, Alternative 4 would result in the ***same impact conclusion*** as the proposed project with respect to impacts on the rate of employment ant total income and business activity in Monterey County, less than significant with mitigation.

Environmental Justice

Health effects resulting from decreased air quality from construction would be location-specific. Impacts from the components that are common with the proposed project would be identical to those described in Section 4.20.5.2. Emissions would be reduced near Marina and Castroville. However, construction emissions associated with the desalination plant and intake and discharge facilities would be located near Moss Landing, an identified minority population and disadvantaged community. Due to the concentration of these facilities near Moss Landing, maximum daily emissions from construction near Moss Landing may exceed the state and/or federal standard for ozone, NO_2, and/or PM_{10}. This impact with respect to the ozone and NO_2 standards would be significant and unavoidable even with implementation of **Mitigation Measures 4.10-1a** and **4.10-1b**. With respect to the PM_{10} standards, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.10-1a** through **4.10-1d**. Therefore, construction of Alternative 4 could result in an increased level of impact compared to the proposed project, because the construction-related impact near a minority population and disadvantaged community may be significant and unavoidable, even with mitigation.

During operation, a long-term increase in future water prices for water consumers would occur; however, the extent of the increase is not yet known. Castroville, a disadvantaged community, would not experience the minor benefit related to improved water quality from Alternative 4 in the same way it would under the proposed project, as described in Section 4.20.5.1, because Alternative 4 would not return water to the CCSD.

Overall, Alternative 4 would result in an ***increased impact conclusion*** compared to the proposed project, significant and unavoidable.

Cumulative Analysis

The geographic scope for the cumulative impact analysis of socioeconomics is the same as that described for the proposed project, plus the additional community of Moss Landing. The contributions of Alternative 4 to cumulative socioeconomic impacts also would be similar to those of the proposed project described in Impact 4.20-C. No communities in the vicinity of Alternative 4 would experience negative socioeconomic impacts resulting from construction. Access for consumers to some businesses may be temporarily affected, which may result in a significant impact on business activity and/or recreational access for tourists, but implementation of **Mitigation Measures 4.9-1**, would minimize the influence of such effects on the tourism industry, reducing them to a less-than-significant level, and no other projects in the cumulative scenario are likely to overlap in time and location with these potential disruptions. Therefore, Alternative 4 would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to socioeconomics, less than significant with mitigation.

The geographic scope for the cumulative impact analysis of environmental justice includes the minority and low-income populations identified in **Tables 4.20-4** and **4.20-5** (i.e., Seaside, Marina, Castroville, and Sand City, and one census tract in downtown Monterey), plus the additional community of Moss Landing, identified as a minority population and disadvantaged community. The contributions of the components common to the proposed project and

Alternative 4 (i.e., the pipelines south of the "Connection to CalAm" point, the ASR system, and the Carmel Valley Pump Station) to cumulative environmental justice impacts would be similarly minimal as compared to those identified in Impact 4.20-C for the proposed project. Alternative 4 would result in less construction in and near Marina and Castroville, reducing but not eliminating localized air pollution near those communities. However, Alternative 4 would result substantial construction activity near the Moss Landing community as a result of construction of the desalination plant, intake and discharge systems, and related facilities in that location. As described above, the impact associated with emissions of NOx would be significant and unavoidable even with implementation of **Mitigation Measures 4.10-1a** and **4.10-1b**. When combined with other construction projects listed in **Table 4.1-2** in Section 4.1, including two additional projects that may have the potential to result in overlapping air quality impacts – the DeepWater Desal Project (No. 34) and the Moss Landing Community Plan (No. 37) – the cumulative localized emissions could be increased compared to Alternative 4 alone. If overlapping construction were to occur, Alternative 4 would result in a significant contribution to a significant cumulative impact. This would be an ***increased level of impact*** compared to the proposed project, significant and unavoidable, even with mitigation.

5.5.20.8 Direct and Indirect Effects of Project Alternative 5 – Reduced Desal Project 5a (CEMEX) and 5b (Potrero Road)

Alternative 5a would include the intake system at the CEMEX site (the same location as the proposed project), but would include only seven subsurface slant wells (the converted test well and six new wells) and the same source water pipeline as the proposed project. Alternative 5b would include seven new wells at the western end of Potrero Road (the same location as Alternative 1) and the same source water pipeline as Alternative 1. Both Alternatives 5a and 5b would include a reduced-capacity desalination plant (6.4 mgd), and all other components would be the same as the proposed project.

Socioeconomics

The impacts of Alternatives 5a and 5b would be similar to those described for the proposed project and Alternative 1, respectively, though the economic and employment benefits would be reduced in proportion to the reduced size of the desalination plant and reduced number of subsurface slant wells. This would result in a decreased potential for beneficial socioeconomic effects because construction-related benefits would last an incrementally shorter period of time. With implementation of applicable mitigation for components common with the proposed project or Alternative 1 that may temporarily disrupt local businesses, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project, less than significant with mitigation.

Environmental Justice

The impacts of Alternatives 5a and 5b would be similar to those described for the proposed project and Alternative 1, respectively, though the air pollution-related adverse impacts on minority and low-income populations would be reduced in proportion to the reduced size of the desalination plant and reduced number of subsurface slant wells. This would result in a decreased potential for disproportionately high and adverse effects because some construction activities would be reduced in duration; however, because they would not increase emissions compared to the less-than-significant local emissions under the proposed project or Alternative 1, Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project, less than significant.

Cumulative Analysis

Combined Impacts with GWR Project

For the same reasons described for the proposed project and Alternative 1, Alternatives 5a and 5b would result in minimal beneficial contributions to cumulative economic and employment effects. However, as described above, the magnitude of impacts of Alternatives 5a and 5b would be reduced compared to the proposed project and Alternative 1, respectively. The addition of the GWR Project (No. 59) described in **Table 4.1-2** in Section 4.1 to the cumulative scenario for Alternative 5 would have a minimal effect on overall cumulative impacts. Combined, the GWR Project and Alternative 5 would have an increased beneficial contribution to cumulative economic and employment effects as a result of the construction of two separate projects. Similarly, the combination of these projects would increase adverse contributions to air pollution-related cumulative impacts on minority and low-income populations during construction compared to Alternative 5 alone. These contributions to overall cumulative impacts would be temporary. The combination of Alternative 5 and the GWR Project may result in greater long-term future rate increases for CalAm ratepayers due to the increased overall cost of these projects in combination.

Impacts of Full Cumulative Scenario

As stated above, the addition of the GWR project – the only other project reasonably foreseeable in the Alternative 5 cumulative scenario compared to that of the proposed project or Alternative 1 – would have a minimal effect on socioeconomic and environmental justice impacts. Therefore, the cumulative impacts under Alternatives 5a and 5b, and the contributions of Alternatives 5a and 5b, would be similar to those described for the proposed project and Alternative 1, respectively. Alternatives 5a and 5b would result in the ***same impact conclusion*** as the proposed project for cumulative effects related to socioeconomics (less than significant with mitigation) and environmental justice (less than significant).

5.5.20.9 References

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U.S. Census Bureau, 2010b. DP03 Selected Economic Characteristics; 2006-2010 American Community Survey 5-Year Estimates; Moss Landing.

U.S. Census Bureau, 2014a. DP05 ACS Demographic and Housing Estimates; 2010-2014 American Community Survey 5-Year Estimates; selected geographies.

U.S. Census Bureau, 2014b. DP03 Selected Economic Characteristics; 2010-2014 American Community Survey 5-Year Estimates; selected geographies.

5.5.21 Growth Inducement

This section describes the potential for the provision of water supply to indirectly induce growth: would implementation of the proposed project or alternatives directly or indirectly cause economic or population growth or residential construction? The potential for direct and/or indirect impacts on population and housing, including the potential to result in the need for additional workforce to support construction and operations is addressed in Section 4.19 for the proposed project and Section 5.5.19 for alternatives. The topic of indirect growth inducement related to the proposed project is fully addressed in Section 6.3 and summarized below.

5.5.21.1 Setting/Affected Environment

This section evaluates the indirect growth inducing impacts of the water supply that would be provided by the alternatives. As discussed in Section 6.3, a water supply project – such as the MPWSP and the “project” alternatives considered here – would be considered growth inducing if it removed water supply limitations as an obstacle to growth. Refer to Section 5.5.18, Population and Housing, for analysis of the alternatives’ direct growth inducing impacts. Since an alternative would only supply water to customers once the alternative was operational, there would be no indirect growth inducing impacts during the construction phase. Therefore, construction phase impacts are not considered further in this section.

The environmental setting/affected environment for Alternatives 1, 2, 4, and 5 consists of the areas that would be served by the alternatives– CalAm’s Monterey District service area (Monterey District); Alternative 3 would also serve other areas of Monterey County as well as Santa Cruz County.

5.5.21.2 Indirect Growth Inducing Effects of The Proposed Project

To determine the MPWSP’s potential to indirectly induce growth, the proposed project was evaluated for its potential to stimulate additional housing development and the need for services as a result of increasing available water supply and providing associated infrastructure improvements. As described in Chapter 2, Water Demand, Supplies, and Water Rights, CalAm proposes that the MPWSP provide, along with other supply sources, sufficient water supply to:

- meet existing annual service area demand;
- serve development that uses existing water entitlements held in the Pebble Beach-Del Monte Forest area;
- develop vacant legal lots of record; and
- support increased water consumption at local restaurants and lodging when tourism increases under improved economic conditions.

Table 5.5-17 summarizes the water demand CalAm proposes to meet with the MPWSP, along with existing and other planned water supply sources. The estimate of existing annual system demand, 12,270 afy, is based on demand in 2010.[13]

**TABLE 5.5-17
MPWSP DEMAND ASSUMPTIONS**

Demand Component	Annual Demand (acre-feet)
Existing Annual System Demand	12,270
Pebble Beach Water Entitlements	325
Hospitality Industry Rebound Economic Recovery	500
Legal Lots of Record	1,180
Total	**14,275**

SOURCE: RBF Consulting, 2013; Svindland, 2016.

Along with existing and other planned water supply sources, the MPWSP would provide up to 16,294 afy during the 25-year Seaside Groundwater Basin replenishment period; an additional 700 afy of Seaside Groundwater Basin supply would be available to the CalAm service area at the end of the replenishment period.[14] Of this 16,294 afy, 12,595[15] afy would serve existing annual service area demand and existing Pebble Beach water entitlements, and another 1,680 afy is proposed to meet anticipated future demand. This includes an estimated 250 afy associated with the local hospitality industry, absent new development, assuming increased economic activity. Thus, 12,845 afy would be used to meet demand associated with existing land uses and water entitlements and 1,430 afy would support new development.

Table 5.5-18 provides a breakdown of demand associated with existing and anticipated land uses assumed for the MPWSP. **Table 5.5-19** shows water supplies that would be available with the MPWSP, compared with the service area demands shown in **Table 5.5-18**, as well as two estimates of the SVGB return water obligation associated with operating the proposed 9.6-mgd desalination plant. **Table 5.5-19** illustrates available and surplus supply (or deficit) during the Seaside Groundwater Basin replenishment period, assuming a 6 percent or 12 percent return water obligation. As shown, under either of these return water scenarios, the available supply would meet demand associated with existing land uses and water entitlements (12,845 afy), with a surplus of 209 or 1,829 afy depending on the return water obligation.

13 Although demand in 2010 is slightly less than the current 10-year average demand (12,351 afy) CalAm assumes this is the appropriate level of demand for planning purposes to ensure the proposed action is sized appropriately to meet peak demands as required by state regulations; see Section 2.3 in Chapter 2 for more information.

14 For the first 25 years of MPWSP operation, CalAm would provide in-lieu replenishment of the Seaside Groundwater Basin in repayment of groundwater CalAm has pumped from the basin in excess of CalAm's adjudicated right, as discussed in Chapter 2, Section 2.2.4. Replenishment would occur at a rate of 700 afy. During the replenishment period, available supply from the Seaside Groundwater Basin would be limited to 774 afy; at the end of the replenishment period, available supply would equal CalAm's adjudicated right of 1,474 afy.

15 Existing annual service area demand now includes the 325 afy Pebble Beach entitlement, and 325 afy was therefore, removed from the anticipated future demand.

**TABLE 5.5-18
EXISTING AND ANTICIPATED DEMAND
(ACRE-FEET PER YEAR)**

Demand Component	MPWSP Demand Assumptions	Demand Associated with Existing Land Uses and Water Entitlements	Demand Associated with Anticipated Development
Existing Annual System Demand	12,270	12,270	-
Pebble Beach Water Entitlements	325	325	
Hospitality Industry Rebound Economic Recovery	500	250[a]	250
Legal Lots of Record	1,180		1,180
Total	**14,275**	**12,845**	**1,430**

NOTES:
[a] A comparison of commercial sector demand prepared for this analysis suggests that demand by the hospitality industry under improved economic conditions may be lower than identified by CalAm; refer to text discussion for more information.

SOURCE: Table 6.3-3.

**TABLE 5.5-19
WATER SUPPLIES AND DEMANDS DURING SEASIDE GROUNDWATER BASIN REPLENISHMENT PERIOD, 9.6-MGD DESALINATION PLANT WITH SVGB RETURN
(ACRE-FEET PER YEAR)**

Supplies and Demands	Existing Demand [a]		Existing and Anticipated Demand	
	6% SVGB Return	12% SVGB Return	6% SVGB Return	12% SVGB Return
Total Supplies[a]	**16,294**	**16,294**	**16,294**	**16,294**
Service Area Demand (Existing and Anticipated)	12,845	12,845	14,275	14,275
Supply Available for Other Use (Total Supplies Minus Service Area Demand)	3,449	3,449	2,019	2,019
SVGB Return (6% and 12%)	1,620	3,240	1,620	3,240
Surplus or (Deficit)	**1,829**	**209**	**399**	**(1,220)**

NOTES: mgd = million gallons per day; Seaside GW Basin = Seaside Groundwater Basin; SVGB = Salinas Valley Groundwater Basin

[a] Includes 325 afy for Pebble Beach water entitlements.
[b] Water supply sources include: Carmel River (3,376 afy), Seaside Groundwater Basin (774 afy), Aquifer Storage and Recovery Project (1,300 afy), Sand City Coastal Desalination Plant (94 afy), and the proposed MPWSP Desalination Plant (10,750 afy), as shown in Table 2-4 of Chapter 2.

SOURCE: Table 2-4, Table 6.3-4.

The 1,430 afy of MPWSP supply that would serve anticipated development, shown in **Table 5.5-18**, is about 40 percent of 3,526 afy, the 2006 estimate of future demand as revised based on updated information and about half of 2,820 afy, the 2006 estimate of future demand as updated and reduced by an additional 20 percent.

The MPWSP would not directly contribute to the creation of additional housing or jobs within the area it serves as it is limited to the construction and operation of water supply facilities and infrastructure. But the proposed project would indirectly support growth by removing some water supply limitations as an obstacle to growth, thereby enabling a degree of growth under the approved general plans within the area served by the MPWSP.

The cities and county in the area served by the proposed project have the authority to approve or deny development projects and to impose mitigation to address significant environmental impacts associated with development projects within their respective jurisdictions. In addition, numerous federal, state, regional, and local agencies are specifically charged with protecting environmental resources, and ensuring that planned development occurs in a sustainable manner. Together, these agencies exercise the authority to reduce the effects of development on the environment. Some unavoidable impacts would still, however, be expected to occur.

Cumulative Analysis

The geographic scope for the cumulative analysis of indirect growth inducement consists of the CalAm Monterey District service area jurisdictions and other areas of Monterey County that could experience similar indirect growth inducement. The baseline environmental setting against which the MPWSP is being analyzed includes the effects of existing, operational water supply projects identified in Table 4.1-2 such as the Seaside Groundwater Basin Aquifer Storage and Recovery projects (Nos. 29 and 30), and Sand City Coastal Desalination Plant (No. 6), which are assumed in water supply planning undertaken for the proposed project (as discussed in Chapter 2, Section 2.4 and shown in Table 2-4). The CalAm Slant Test Well at CEMEX (No. 47) is assumed to be used for production of the proposed MPWSP supply.

Several of the planned future cumulative projects identified in Table 4.1-2 would provide new sources of potable water supply in Monterey County. Growth induced by one or more of these cumulative water supply projects in combination with the proposed project would result in secondary effects of growth in Monterey County that are similar to, but would likely be more severe and widespread than, those summarized above in Table 6.3-9; these impacts include increased traffic, noise, and air pollution and loss of open space and biological resources.

Other water projects listed in Table 4.1-2, would either provide non-potable recycled water supply or enhance groundwater recharge. Projects providing recycled water could offset demand for potable supply that is currently used for non-potable uses, thereby making that potable supply available for other uses including growth. Projects capturing and diverting stormwater runoff to enhance groundwater recharge would primarily improve surface water quality and help stop seawater intrusion, but may overtime increase the availability of groundwater supply. These projects could contribute to the growth-inducing impacts of the cumulative potable supply projects described above by increasing the availability of existing potable supplies and groundwater.

5.5.21.3 Indirect Growth Inducing Effects of No Project Alternative

The No Project Alternative would deliver less water than the proposed project, would not be able to reliably serve existing customers, and therefore, would have no indirect growth inducing effects associated with the provision of water supply and it would not achieve the benefits of the proposed project in terms of providing minor amounts of additional water to accommodate some growth. The No Project Alternative water supplies of 11,314 afy, through September 2018, would be reduced by 1,000 af annually to 6,380 afy by January 2022. This supply could not serve the baseline demand of 12,595 afy – or 11,335 afy, assuming ongoing implementation of conservation programs reduced demand to this amount by 2021 – and the implementation of Stage 3 Conservation Measures and Stage 4 Rationing would be required.

5.5.21.4 Indirect Growth Inducing Effects of Alternative 1 – Slant Wells at Potrero Road)

Operational Impacts

The indirect growth-inducing impact of Alternative 1 would be similar to that of the proposed project, although slightly decreased because source water pumped under this alternative is expected to include more groundwater that originated from inland aquifers than the proposed project, requiring a higher percentage of water to be returned to the SVGB. Therefore, less desalinated product water likely would be available to support growth. With CalAm's other supply sources, water supplies would total 16,294 afy, shown in **Table 5.5-20**, the same as for the proposed project (shown in **Table 6.3-4** in Section 6.3, Growth Inducement, of Chapter 6, Other Considerations). After meeting existing service area demand and entitlements of 12,845 afy and an assumed 6 percent SVGB return water obligation,[16] 1,829 afy would be available for other uses during the 25-year Seaside Groundwater Basin (SGB) replenishment period.

Although the precise amount of the return water obligation is not currently known, this analysis assumes that Alternative 1, like the MPWSP, would provide enough supply to meet the level of service area demand that CalAm proposes to meet, 14,275 afy. The surplus shown in **Table 5.5-20** indicates that Alternative 1 would have some operational flexibility needed to meet the *peak demands* that would be associated with the anticipated average annual demand, including about 1,430 afy of water for anticipated future development – that is, water for growth. As discussed in Section 6.3.5.3, this level of growth is consistent with the growth planned for in the adopted land use plans of service area jurisdictions. The environmental consequences of planned growth have been addressed in adopted local land use plans and their associated CEQA documents, as well as in other, project-specific documentation, as discussed in Section 6.3.6. Some of the identified indirect effects of this growth would be significant and unavoidable while other effects would be significant but can be mitigated.

Assuming a 6 percent SVGB return water obligation, this alternative would not provide enough supply to meet the estimated 3,526 afy of additional service area demand associated with general plan buildout (discussed in Section 2.5.3 of Chapter 2 and shown in **Table 2-5**). Following the conclusion of the Seaside Groundwater Basin replenishment period, an additional 700 afy of supply would be available to meet additional demands; however, it would still not meet projected future demands in the CalAm service area. This additional supply could provide CalAm added operational flexibility or could be used to serve a degree of additional growth still within the levels of approved general plans.

[16] The 6 percent return water obligation assumed here is an example of what the return obligation could be. The SVGB return water obligation will be based on observed values of the source water. Groundwater modeling performed for this EIR/EIS simulated scenarios with 0, 3, 6, and 12 percent of the source water extracted via subsurface slant wells being returned to the SVGB (see Section 4.4, Groundwater Resources).

TABLE 5.5-20
ALTERNATIVE 1 – SLANT WELLS AT POTRERO ROAD WATER SUPPLIES AND DEMANDS DURING SGB REPLENISHMENT PERIOD: TWO FUTURE DEMAND SCENARIOS (ACRE-FEET PER YEAR)

	Supply Compared to MPWSP-Anticipated Demands	Supply Compared to Updated MPWMD Estimate of Future Supply Needs
Existing/Other CalAm Supplies[a]	5,544	5,544
Supply provided by Alternative 1	10,750	10,750
Total Supplies	**16,294**	**16,294**
Minus Existing Service Area Demand (Table 6.3-3)	12,845	12,845
Minus SVGB Return Obligation (Assuming 6% Return Obligation)[b]	1,620	1,620
Supply Available for Other Use (Supplies Minus Existing Demand and Return Obligation)	**1,829**	**1,829**
Minus Future Demands: Two Scenarios	1,430[c]	3,526[d]
Surplus or (Deficit)	**399**	**(1,697)**

NOTES: SGB = Seaside Groundwater Basin; SVGB = Salinas Valley Groundwater Basin; afy = acre feet per year

a Existing/Other CalAm supplies consist of 3,376 afy from the Carmel River, 774 afy from the Seaside Groundwater Basin, 1,300 afy from the Aquifer Storage and Recovery Project, 94 afy from the Sand City Coastal Desalination Plant. At the end of the 25-year Seaside Groundwater Basin replenishment period CalAm's supply from that the groundwater basin will increase by 700 afy to 1,474 afy.
b The SVGB return water obligation will be based on the observed amount of fresh water component in the source water. The percentage of return water required for pumping at the Potrero Road site (this alternative) is expected to be higher than the percentage of return water that would be required for pumping at the CEMEX site (the MPWSP).
c Demand associated from anticipated development CalAm proposes to meet with the MPWSP (see Section 6.3.5.1 and Table 6.3-3).
d MPWMD's 2006 estimate of future water supply needs updated by more recent information (see Section 6.3.5.3 and Table 6.3-8).

SOURCE: Table 2-4, Table 6.3-3, Table 6.3-8.

While the above analysis discloses the indirect growth inducing impact of Alternative 1 associated with a 6 percent SVGB return water obligation, the analysis in Section 5.5.4.3, which describes the impacts of Alternative 1 on groundwater resources, suggests that a higher return water percentage would be necessary under Alternative 1. In the event that the return water obligation is determined to be 12 percent (the highest return value simulated), after meeting existing demand and entitlements only 209 afy would be available for other uses, which would not meet either future demand scenario and, therefore, Alternative 1 would not fully meet the project objective/need for water, some of which was to support limited growth (e.g., legal lots of record). The indirect growth inducing impact of this alternative assuming a 12 percent SVGB return would result in a ***reduced impact conclusion*** compared to the proposed project, less than significant.

Cumulative Analysis

The geographic scope for the cumulative analysis of indirect growth inducement impacts of Alternative 1 is Monterey and Santa Cruz Counties. The cumulative impact would be similar to that described for the MPWSP in Section 6.3.7. Of the planned sources of new potable water supply for Monterey County and other areas identified in **Table 4.1-2**, the DeepWater Desal Project (No. 34) could combine with Alternative 1 to have cumulative growth inducing impacts in the areas that would be served by these projects. If both projects were approved, Alternative 1 would supply water to the CalAm service area, as described under operational impacts above, and the entire 25,000 afy produced by the DeepWater Desal Project would be provided to the city of Salinas in Monterey County and to areas of Santa Cruz County.

In addition, the RUWAP Desalination Element (No. 31 in **Table 4.1-2** in Section 4.1) would serve the Marina Coast Water District's Ord Community with approximately 1,000 afy of potable supply. Through an agreement with FORA and the MRWPCA, an additional 1,400 afy of potable supply from the Pure Water Delivery and Supply Project (No. 35) would meet the build-out needs of the Ord Community, which is contiguous with CalAm's service area. The Granite Ridge Water Supply Project (No. 33) would increase water supply availability for the area of northern Monterey County that it would serve. The Interlake Tunnel Project (No. 24) would reduce the amount of water spilled at Nacimiento Dam by allowing water from Nacimiento Reservoir to be stored at San Antonio Reservoir for later use. This project would enhance flood control, provide environmental benefits, and offset groundwater pumping. However, because this project would provide groundwater recharge, this analysis assumes it could indirectly augment supply available for groundwater users, including municipal supply that could serve additional growth. Although the primary purpose of the Salinas Valley Water Project Phase II (No. 1) is to combat seawater intrusion by providing a new source of surface water to offset groundwater consumption, the availability of a reliable surface water supply provided by this project could induce growth by removing supply reliability limitations as an obstacle to urban development.

Growth induced by these cumulative water supply projects in combination with Alternative 1 would result in secondary effects of growth that are similar to, but would likely be more widespread in Monterey and Santa Cruz Counties than those summarized in **Table 6.3-9** in Section 6.3 for the CalAm service area only. These impacts include increased traffic, noise, and air pollution and loss of open space and biological resources.

Other water projects listed in **Table 4.1-2**, including the RUWAP Recycled Water Project (No. 35), West Broadway Stormwater Retention Project (No. 41), Del Monte Boulevard Dry Weather Diversion Project (No. 44), Pacific Grove Local Water Project (No. 22), Pacific Grove Recycled Water Project (No. 23), and Monterey Pacific Grove Area of Special Biological Significance (ASBS) Stormwater Management Project (No. 45), would either provide non-potable recycled water supply or enhance groundwater recharge. As described for the MPWSP, projects providing recycled water could offset demand for potable supply that is currently used for non-potable uses, thereby making that potable supply available for other uses, including growth. Projects capturing and diverting stormwater runoff to enhance groundwater recharge would primarily improve surface water quality and help stop seawater intrusion, but may overtime increase the availability of groundwater supply. These projects would eliminate an impediment to growth; some of the impacts of that growth were determined by the general plan EIRs to be significant and unavoidable and could contribute to the growth inducing impacts of Alternative 1 and the DeepWater Desal project by increasing the availability of existing potable supplies and groundwater. Because Alternative 1 would have a significant and unavoidable impact, it would have a significant contribution to significant and unavoidable cumulative impacts of indirect growth inducement.

5.5.21.5 Indirect Growth Inducing Effects of Alternative 2 – Open Water Intake at Moss Landing

Operational Impacts

The indirect growth-inducing impact of Alternative 2 would be similar to, but greater than, that of the proposed project because this alternative would produce the same amount of desalinated product water and no desalinated water would need to be returned to the SVGB. As under the MPWSP, with CalAm's other supply sources, water supplies would total 16,294 afy, shown in **Table 5.5-21**.

TABLE 5.5-21
ALTERNATIVE 2 – OPEN OCEAN INTAKE AT MOSS LANDING WATER SUPPLIES AND DEMANDS DURING SGB REPLENISHMENT PERIOD: TWO FUTURE DEMAND SCENARIOS (ACRE-FEET PER YEAR)

	Supply Compared to MPWSP-Anticipated Demands	Supply Compared to Updated MPWMD Estimate of Future Supply Needs
Existing/Other CalAm Supplies[a]	5,544	5,544
Supply provided by Alternative 2	10,750	10,750
Total Supplies	**16,294**	**16,294**
Minus Existing Service Area Demand (Table 6.3-3)	12,845	12,845
Supply Available for Other Use (Supplies Minus Existing Demand)	**3,449**	**3,449**
Minus Future Demands: Two Scenarios	1,430[b]	3,526[c]
Surplus or (Deficit)	**2,019**	**(77)**

NOTES: SGB = Seaside Groundwater Basin; afy = acre feet per year

[a] Existing/Other CalAm supplies consist of 3,376 afy from the Carmel River, 774 afy from the Seaside Groundwater Basin, 1,300 afy from the Aquifer Storage and Recovery Project, 94 afy from the Sand City Coastal Desalination Plant. At the end of the 25-year Seaside Groundwater Basin replenishment period CalAm's supply from that the groundwater basin will increase by 700 afy to 1,474 afy.
[b] Demand associated from anticipated development CalAm proposes to meet with the MPWSP (see Section 6.3.5.1 and Table 6.3-3).
[c] MPWMD's 2006 estimate of future water supply needs updated by more recent information (see Section 6.3.5.3 and Table 6.3-8).

SOURCE: Table 2-4, Table 6.3-3, Table 6.3-8.

After meeting existing service area demand and entitlements of 12,845 afy, 3,449 afy would be available to support growth in the CalAm service area during the 25-year Seaside Groundwater Basin replenishment period. This is substantially more than the 1,430 afy of anticipated future development demand CalAm proposes to meet with the MPWSP and similar to the estimated 3,526 afy of additional service area demand associated with general plan buildout (discussed in Section 2.5.3 of Chapter 2 and shown in **Table 2-5**). While this alternative appears to almost meet projected future general plan demands, water use does not occur at an average rate throughout the year (as discussed in Section 2.3.2), and it is unlikely this alternative could provide the operational flexibility to meet the peak demands associated with general plan buildout.

In any event, the growth inducing impact of Alternative 2 would be greater than the proposed project because Alternative 2 would remove water supply limitations as an obstacle to growth to a greater extent than would the MPWSP. The environmental consequences of planned growth that would be supported by this alternative have been addressed in the adopted land use plans and associated CEQA documents of service area jurisdictions, as discussed in Section 6.3.6. Some of the identified indirect effects of this growth would be significant and unavoidable while other effects would be significant but can be mitigated.

Following the conclusion of the Seaside Groundwater Basin replenishment period, an additional 700 afy of supply will be available to meet demands in the CalAm service area. This additional supply could provide CalAm added operational flexibility to meet peak demands or it could be used to serve a degree of additional growth.

The greater indirect growth inducing impact of this alternative would result in an ***increased impact conclusion*** compared to the proposed project, significant and unavoidable.

Cumulative Analysis

The cumulative scenario for Alternative 2 would be the same as described above for Alternative 1. The contribution of Alternative 2 to significant and unavoidable cumulative impacts of indirect growth inducement would be significant and would be increased compared to the proposed project and Alternative 1 as a result of the greater amount of water available for growth under Alternative 2, as shown in **Table 5.5-21**.

5.5.21.6 Indirect Growth Inducing Effects of Alternative 3 – Monterey Bay Regional Water Project (DeepWater Desal)

Operational Impacts

The indirect growth-inducing impact of Alternative 3 would be greater than that of the proposed project because this alternative would produce about 14,000 afy more desalinated water. Assuming CalAm purchased 10,750 afy (9.6 mgd) from DeepWater Desal for use in the CalAm service area, CalAm supplies would total 16,294 afy, as shown in **Table 5.5-22**. Because no desalinated water would need to be returned to the SVGB, more water would be available to the service area; after meeting existing demand and entitlements of 12,845 afy, 3,449 afy would be available under Alternative 3 to support growth in the CalAm service area during the 25-year Seaside Groundwater Basin Replenishment period. This is substantially more than the 1,430 afy of anticipated future demand CalAm proposes to meet with the MPWSP and similar to the estimated 3,526 afy of service area demand associated with general plan buildout (discussed in Section 2.5.3 of Chapter 2 and shown in **Table 2-5**).

Assuming CalAm purchased 10,750 afy for use in the CalAm service area, the remaining 14,250 afy produced by Alternative 3 would be available for other areas of Monterey and Santa Cruz Counties. Other areas that may be served by this alternative include the city of Salinas, the unincorporated community of Castroville, other areas of northern Monterey County, and areas of Santa Cruz County.

Therefore, the indirect growth-inducing impact of Alternative 3 would be greater than the MPWSP because this alternative would remove water supply limitations as an obstacle to growth in a much larger area of the region as well as within CalAm's service area. The environmental consequences

TABLE 5.5-22
ALTERNATIVE 3 – DEEPWATER DESAL WATER SUPPLIES AND DEMANDS DURING SGB REPLENISHMENT PERIOD: TWO FUTURE DEMAND SCENARIOS (ACRE-FEET PER YEAR)

Supplies/Demands	Supply Compared to MPWSP-Anticipated Demands	Supply Compared to Updated MPWMD Estimate of Future Supply Needs
Existing/Other CalAm Supplies[a]	5,544	5,544
Alternative 3 Water Provided to CalAm Service Area/Purchased From DeepWater Desal Project[b]	10,750	10,750
Total Supplies to CalAm Service Area	**16,294**	**16,294**
Minus Existing Service Area Demand (Table 6.3-3)	12,845	12,845
CalAm Service Area Supply Available for Other Use (Supplies Minus Existing Demand)	**3,449**	**3,449**
Minus Future Service Area Demands: Two Scenarios	1,430 [c]	3,526 [d]
Surplus or (Deficit) within CalAm Service Area	**2,019**	**(77)**
Supply Available for Other Areas[e]	**14,250**	**14,250**

NOTES: SGB = Seaside Groundwater Basin; mgd = million gallons per day; afy = acre feet per year

a Existing/Other CalAm supplies consist of 3,376 afy from the Carmel River, 774 afy from the Seaside Groundwater Basin, 1,300 afy from the Aquifer Storage and Recovery Project, 94 afy from the Sand City Coastal Desalination Plant. At the end of the 25-year Seaside Groundwater Basin replenishment period CalAm's supply from that the groundwater basin will increase by 700 afy to 1,474 afy.
b Supply to the CalAm Service area assumes DeepWater Desal LLC would provide, and CalAm would purchase, 9.6 mgd, or 10,750 afy of desalinated water from the DeepWater Desal Project.
c Demand associated from anticipated development CalAm proposes to meet with the MPWSP (see Section 6.3.5.1 and Table 6.3-3).
d MPWMD's 2006 estimate of future water supply needs updated by more recent information (see Section 6.3.5.3 and Table 6.3-8).
e The DeepWater Desal Project would produce 25,000 afy of desalinated product water. After delivering 9.6 mgd (10,750 afy) 14,250 afy would be available to other areas of Monterey and Santa Cruz Counties.

SOURCE: Table 2-4, Table 6.3-3, Table 6.3-8.

of planned growth in the CalAm service area that would be supported by this alternative have been addressed in the adopted land use plans and associated CEQA documents of service area jurisdictions, as discussed in Section 6.3.6 (discussed in Section 6.3.6). Some of the identified indirect effects of this growth would be significant and unavoidable while other effects would be significant but can be mitigated.

Because information is not currently available about how much and where the remaining 14,250 afy of water produced by this alternative may be used, whether for replacement supplies or for growth, the consistency of this supply with planned growth in areas that would receive it cannot be definitively assessed. But because of the amount of water that would be available, impacts would likely be significant and unavoidable. The separate EIR/EIS that is being prepared for the DeepWater Desal project will provide more detailed analysis on this topic.

Following the conclusion of the Seaside Groundwater Basin replenishment period, another 700 afy of supply would be available to the CalAm service area. This additional supply could provide CalAm greater operational flexibility, could be used to serve a degree of additional growth, or could prompt CalAm to reduce the amount of water it purchases from DeepWater Desal, in which case more desalinated product water from DeepWater Desal would be available to other areas.

Therefore, the indirect growth inducing impact of this alternative would result in an ***increased impact conclusion*** compared to the proposed project, significant and unavoidable.

Cumulative Analysis

The geographic scope for the cumulative analysis of indirect growth inducement impacts of Alternative 3 is Monterey and Santa Cruz Counties. Of the planned sources of new potable water supply for Monterey County identified in **Table 4.1-2**, the GWR Project (No. 59) could combine with Alternative 3 to have cumulative growth inducing impacts in the areas that would be served by these projects. If both projects were approved, it is assumed that Alternative 3 would supply water to the CalAm service area equivalent to the production of a 6.4 mgd plant, or about 7,170 afy, supplementing the water that would be supplied by the GWR project, and the remaining 17,830 afy produced by Alternative 3 would be provided to the city of Salinas, the unincorporated community of Castroville, other areas of Monterey County and areas of Santa Cruz County.

In addition, the other projects in the cumulative scenario, described above for Alternative 1, could induce growth by removing supply reliability limitations as an obstacle to urban development. Growth induced by these cumulative water supply projects in combination with Alternative 3 would result in secondary effects of growth in Monterey and Santa Cruz Counties that are similar to, but would likely be more severe and widespread than, those summarized in **Table 6.3-9**. These impacts include increased traffic, noise, and air pollution and loss of open space and biological resources.

The overall cumulative impact would be significant and unavoidable. While the total amount of water available for growth would be reduced under the Alternative 3 cumulative scenario compared to the proposed project scenario (because only the Alternative 3 desalination plant would be built, compared to building it and the proposed project), the contribution of Alternative 3 to significant and unavoidable cumulative impacts of indirect growth inducement would be significant and increased compared to the proposed project and Alternatives 1 and 2 as a result of the greater amount of water available for growth under Alternative 3, as shown in **Table 5.5-22**.

5.5.21.7 Indirect Growth Inducing Effects of Alternative 4 – People's Moss Landing Desalination Project

Operational Impacts

The indirect growth-inducing impact of Alternative 4 would be greater than that of the proposed project because this alternative would provide substantially more water. Based on the 13,400 afy the People's Moss Landing Project proposes to deliver from its proposed 12 mgd desalination plant, supplies under this alternative would total 18,944 afy, as shown in **Table 5.5-23**. This is substantially more than the proposed project's 16,294 afy, and because no desalinated water would need to be returned to the SVGB, the entire supply would be available for use. After meeting existing demand and entitlements of 12,845 afy in the CalAm Monterey District service area, 6,099 afy would be available to support growth in the region during the Seaside Groundwater Basin Replenishment period. This is more than three times the amount that would be available under the proposed project (1,829 afy), assuming a 6 percent return water obligation, and would be almost twice the 3,526 afy estimate of future Monterey District service area demand under general plan buildout (discussed in Section 2.5.3 of Chapter 2 and shown in **Table 2-5**). This alternative would provide substantially more water than needed to meet demand associated with General Plan buildout in the CalAm service area, based on currently available information.[17] Although surplus supply could be delivered to other users in the region, the growth that could be supported in the Monterey District service area by this alternative would be beyond the level evaluated in adopted land use plans and would likely have impacts related to increased density (such as increased traffic and noise) or the development of new land areas (such as loss of open space, wildlife habitat, and agricultural land), potentially resulting in impacts that are more severe than those identified in the EIRs of adopted land use plans and plan elements. The separate EIR/EIS that is being prepared for the People's Project will provide more detailed information on this topic.

TABLE 5.5-23
ALTERNATIVE 4 – PEOPLE'S PROJECT WATER SUPPLIES AND DEMANDS DURING SGB REPLENISHMENT PERIOD: TWO FUTURE DEMAND SCENARIOS (ACRE-FEET PER YEAR)

Supplies/Demands	Supply Compared to MPWSP-Anticipated Demands	Supply Compared to Updated MPWMD Estimate of Future Supply Needs
Existing/Other CalAm Supplies[a]	5,544	5,544
Alternative 4 Water Provided to CalAm Service Area/Purchased From People's Project [b]	13,400	13,400
Total Supplies	**18,944**	**18,944**
Minus Existing Service Area Demand (Table 6.3-3)	12,845	12,845
Supply Available for Other Use (Supplies Minus Existing Demand)	**6,099**	**6,099**
Minus Future Demands: Two Scenarios	1,430[c]	3,526[d]
Surplus or (Deficit)	**4,669**	**2,573**

NOTES: SGB = Seaside Groundwater Basin; mgd = million gallons per day; afy = acre feet per year

[a] Existing/Other CalAm supplies consist of 3,376 afy from the Carmel River, 774 afy from the Seaside Groundwater Basin, 1,300 afy from the Aquifer Storage and Recovery Project, 94 afy from the Sand City Coastal Desalination Plant. At the end of the 25-year Seaside Groundwater Basin replenishment period CalAm's supply from that the groundwater basin will increase by 700 afy to 1,474 afy.
[b] Supply assumes the People's Project would provide, and CalAm would purchase, 12 mgd, or 13,400 afy of desalinated water from the People's Project.
[c] Demand associated from anticipated development proposed to be met by the MPWSP (see Section 6.3.5.1 and Table 6.3-3).
[d] MPWMD's 2006 estimate of future water supply needs updated by more recent information (see Section 6.3.5.3 and Table 6.3-8).

SOURCE: Table 2-4, Table 6.3-3, Table 6.3-8.

Following the conclusion of the Seaside Groundwater Basin replenishment period, an additional 700 afy of supply would be available, which would support an even greater degree of growth beyond that anticipated in jurisdictions' general plans.

Therefore, the indirect growth inducing impact of this alternative would result in an ***increased impact conclusion*** compared to the proposed project, significant and unavoidable.

[17] As discussed in more detail in Section 2.5.3.4, General Plan Buildout, of Chapter 2, the future demand estimate assumed in this analysis, 3,526 afy, is based on MPWMD's 2006 estimate of future water supply needs as updated by more recent information.

Cumulative Analysis

The cumulative scenario for Alternative 4 would be the same as described above for Alternative 1. Of the planned sources of new potable water supply identified in **Table 4.1-2**, the DeepWater Desal Project (No. 34) could combine with Alternative 4 to have cumulative growth inducing impacts in the areas that would be served by these projects. If both projects were approved, Alternative 4 would supply water to the CalAm service area, as described under operational impacts above, and the entire 25,000 afy produced by the DeepWater Desal Project would be provided to the city of Salinas and other areas in Monterey and Santa Cruz Counties. The contribution of Alternative 4 to significant and unavoidable cumulative impacts of indirect growth inducement in the CalAm Service District would be significant and would be increased compared to the proposed project or Alternatives 1 through 3 as a result of the greater amount of water available for growth as shown in **Table 5.5-23** and would be cumulatively considerable and the same as the proposed project for the other areas of Monterey and Santa Cruz counties.

5.5.21.8 Indirect Growth Inducing Effects of Alternatives 5a and 5b

Operational Impacts

The indirect growth-inducing impact of both Alternative 5a and 5b would be less than that of the proposed project because neither alternative would provide enough water to support growth. Neither Alternative 5a nor 5b would provide enough supply to meet both existing demand and the SVGB return water obligation associated with operation of the subsurface slant wells. Supplies provided by Alternatives 5a and 5b with CalAm's other supplies would total 12,711 afy during the 25-year Seaside Groundwater Basin replenishment period, as shown in **Table 5.5-24**. This amount is less than existing service area demands and entitlements of 12,845 afy, and is unlikely to provide the operational flexibility needed to meet peak demands that would be associated with an annual average demand of 12,711 afy. After meeting existing demands and entitlements to the extent feasible, no supply would be available for other uses or for the 6 percent return water obligation assumed in considering the project alternatives.[18] Furthermore, as described for Alternative 1, modeling analysis of pumping at the Potrero Road site suggests that a higher return water percentage would be necessary under Alternative 5b; perhaps closer to 12 percent. Under Alternative 5b, using a 12 percent assumption for the return water obligation, the deficit in available return water would be that much greater than the 6 percent obligation assumed for Alternative 5a (2,084 afy rather than 1,042 afy). Considering that neither alternative is expected to provide enough supply to meet existing demands or the SVGB return water obligation associated with operation of the subsurface slant wells, neither alternative would provide water to support future growth. They would therefore not remove water supply limitations as an obstacle growth and would not be growth inducing. Following the conclusion of the Seaside Groundwater Basin replenishment period, another 700 afy of supply would be available to the CalAm service area. This additional supply could provide CalAm greater operational flexibility to meet peak demands and to meet some of its return water obligation.

[18] As stated in Chapter 2, the SVGB return water obligation will be based on the amount of fresh water in the source water. In order to consider the effect of the return water for this EIR/EIS, groundwater modeling simulated scenarios with return water obligations representing 0, 3, 6, and 12 percent of the source water (see Section 4.4, Groundwater Resources).

TABLE 5.5-24
ALTERNATIVE 5 – REDUCED DESALINATION PLANT WATER SUPPLIES AND DEMAND DURING SGB REPLENISHMENT PERIOD: TWO FUTURE DEMAND SCENARIOS (ACRE-FEET PER YEAR)

Supplies/Demands	Supply Compared to MPWSP-Anticipated Demands	Supply Compared to Updated MPWMD Estimate of Future Supply Needs
Existing/Other CalAm Supplies[a]	5,544	5,544
6.4-MGD Desalination Plant Production[b]	7,167	7,167
Total Supplies	**12,711**	**12,711**
Minus Existing Service Area Demand (Table 6.3-3)	12,845	12,845
Minus SVGB Return Obligation (Assuming 6% Return Obligation)[c]	1,042	1,042
Supply Available for Other Use or (Deficit) (Supplies Minus Existing Demand and Return Obligation)	**(1,176)**	**(1,176)**
Minus Future Demands: Two Scenarios (Tables 6.3-3 and 6.3-8)	1,430[d]	3,526[e]
Surplus or (Deficit)	(2,606)	(4,702)

NOTES: SGB = Seaside Groundwater Basin; SVGB = Salinas Valley Groundwater Basin mgd = million gallons per day

a Existing/Other CalAm supplies consist of 3,376 afy from the Carmel River, 774 afy from the Seaside Groundwater Basin, 1,300 afy from the Aquifer Storage and Recovery Project, 94 afy from the Sand City Coastal Desalination Plant. At the end of the 25-year Seaside Groundwater Basin replenishment period CalAm's supply from that the groundwater basin would increase by 700 afy to 1,474 afy.
b Assumed annual supply is based on a 6.4-mgd desalination plant operating at full capacity.
c Alternative 5 includes two alternatives – Alternative 5a and Alternative 5b. Both consist of a 6.4-mgd desalination plant. Source water for Alternative 5a would be from slant wells at the CEMEX site. Source water for Alternative 5b would be from slant wells at the Potrero Road site. The SVGB return water obligation will be based on the amount of the fresh water component of the source water. The return water estimate shown here is based on a 6 percent return water obligation as an example. The 6 percent return water obligation is assumed for Alternative 5a. The percentage of return water required for pumping at the Potrero Road site (Alternative 5b) is expected to be higher than for pumping at the CEMEX site (Alternative 5a).
d Demand associated from anticipated development CalAm proposes to meet with the MPWSP (see Section 6.3.5.1 and Table 6.3-3).
e MPWMD's 2006 estimate of future water supply needs updated by more recent information (see Section 6.3.5.3 and Table 6.3-8).

SOURCE: Table 2-4, Table 6.3-3; Table 6.3-8.

Neither Alternative 5a nor 5b would fully meet current demands and entitlements and therefore would not provide water to support growth. The indirect growth inducing impact of Alternative 5 would result in a ***reduced impact conclusion*** compared to the proposed project, less than significant.

Cumulative Analysis

The geographic scope for the cumulative analysis of indirect growth inducement impacts of Alternatives 5a and 5b is Monterey and Santa Cruz Counties. The cumulative impact would be similar to that described for the MPWSP. Of the planned sources of new potable water supply for Monterey County and other areas identified in **Table 4.1-2**, the GWR Project (No. 59) and DeepWater Desal (No. 34) could combine with Alternative 5 to have cumulative growth inducing impacts in the areas that would be served by these projects. If the three projects were approved, CalAm would purchase 3,500 afy of GWR Project water to supplement the water produced by Alternative 5. Together, water supplies from Alternative 5 and the GWR Project, with CalAm's other sources, would total 16,211 afy. This is slightly less than the MPWSP alone would provide, but the total volume of SVGB return water obligation under Alternatives 5a and 5b would be smaller compared to the proposed project and Alternative 1, respectively, due to the reduced pumping volume of the smaller desalination plant. Under the cumulative scenario, the GWR Project would provide water to the CalAm service area, and the entire 25,000 afy produced by the DeepWater Desal project would be provided to the city of Salinas in Monterey County and to areas of Santa Cruz County.

In addition, the other projects in the cumulative scenario, described above for Alternative 1, could induce growth by removing supply reliability limitations as an obstacle to urban development. Growth induced by these cumulative water supply projects in combination with Alternative 5 would result in secondary effects of growth that are similar to, but would likely be more widespread in Monterey and Santa Cruz Counties than those summarized in **Table 6.3-9**. These impacts include increased traffic, noise, and air pollution and loss of open space and biological resources.

After meeting existing service area demand and entitlements of 12,845 afy, Alternative 5a, in combination with the water purchase agreement with the GWR Project, would result in 2,324 afy available for other use. This is more than the 1,430 afy of anticipated future demand CalAm proposes to meet with the MPWSP, and therefore is assumed to provide substantial flexibility to meet associated peak demands; available supply would not be enough to meet the estimated 3,526 afy of service area demand associated with general plan buildout. Alternative 5b in combination with the GWR Project, assuming a 12 percent SVGB return water obligation, would result in 1,282 afy available for other use. Given that this is slightly less than the future demand CalAm proposes to meet with the MPWSP, Alternative 5b with the GWR project is also assumed to provide less flexibility to meet peak demands, and also would not provide enough supply to meet the estimated service area demand associated with general plan buildout. Both Alternatives 5a and 5b combined with GWR Project water could support a degree of growth that would result in potentially significant impacts. The overall cumulative impact would be significant and unavoidable. The contribution of Alternative 5a and 5b to significant and unavoidable cumulative impacts of indirect growth inducement would be significant and would be similar to the proposed project as a result of the total amount of water available for growth under Alternative 5a and 5b in combination with the GWR Project.

5.5.21.9 References

RBF Consulting, 2013. Memorandum from Paul Findley to Richard Svindland, California American Water, Subject Recommended Capacity for the Monterey Peninsula Water Supply Project (MPWSP) Desalination Plant, January 7, 2013.

Svindland, Richard C., 2016. Supplemental Testimony of Richard C. Svindland; ERRATA, Before the Public Utilities Commission of the State of California, Application No. 12-04-019 (Filed April 23, 2012), April 14, 2016, plus Attachment 1, Demand Scenarios.

5.6 Environmentally Superior/Environmentally Preferred Alternative and NOAA-Preferred Alternative

This section presents a summary comparison of the overall potential environmental impacts of the proposed project and alternatives in order to identify an environmentally superior alternative under CEQA and an environmentally preferred alternative under NEPA, and the NOAA-preferred alternative. Environmental advantages and disadvantages of each alternative are discussed. Section 5.5 addresses the individual impacts associated with each alternative by topic and by individual impact. The alternatives, as described in Chapter 3 (Description of Proposed Project) and Section 5.4, are the proposed project, no project/no action, Alternative 1 (Slant Wells at Potrero Road), Alternative 2 (Open-Water Intake at Moss Landing), Alternative 3 (Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)), Alternative 4 (People's Moss Landing Water Desalination Project (People's Project)), Alternative 5a (Reduced Project 6.4-mgd Desalination Plant - Intake Slant Wells at CEMEX), and Alternative 5b (Reduced Project 6.4-mgd Desalination Plant - Intake Slant Wells at Potrero Road).

The analysis of alternatives presented in this section and Section 5.5, taken together with the analysis of the proposed project in Chapter 4, provide a basis to identify the environmentally superior alternative under CEQA (CEQA Guidelines Section 15126.6) and the environmentally preferred alternative under NEPA (40 CFR 1502.14(e)). Although NEPA CEQ regulations (40 CFR §1505.2) require the identification of the "environmentally preferable" alternative for the Record of Decision (ROD), this Final EIR/EIS identifies the environmentally preferred alternative for informational purposes. In this document, the environmentally superior/ environmentally preferred alternative is the alternative identified as meeting most of the basic project objectives, similar to satisfying the primary purpose and need, and resulting in the fewest or least severe combination of significant environmental impacts. CEQA Guidelines Section 15126.6 provides that if the No Project Alternative is the environmentally superior alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. Here, the No Project Alternative may technically qualify as the environmentally superior/ environmentally preferred alternative because it would involve the least amount of impact on the existing physical environment. However, it would not meet most of the basic project objectives; it would have considerable economic and socioeconomic consequences (e.g., severe water conservation measures), and could result in different impacts than the proposed project or other alternatives given the failure of the No Project Alternative to supply sufficient water for customers within the CalAm service area. For this reason, the discussion below focuses on selecting another environmentally superior/environmentally preferred alternative from among the alternatives (including the proposed MPWSP) presented in this EIR/EIS.

It is important to recognize that the selection of the environmentally superior/environmentally preferred alternative is not always a straight-forward and formulaic exercise. In some cases, including here, no alternative stands out from the others as eliminating all significant and unavoidable, long-term environmental effects. There are environmental tradeoffs among the alternatives and even within resource issue areas or topics, making it difficult to summarize the net effect of the alternatives. As such, considerable weighing among the severity of impacts of the alternatives and professional judgment as to the relative importance of topical impact areas is necessary. Such judgment, while based on reasoning grounded in the scientific study that comprises the EIR/EIS, can be subjective. This means that, although this EIR/EIS identifies an environmentally superior/environmentally preferred alternative, the CPUC and MBNMS decision-makers could ultimately come to a different conclusion as to which alternative is the environmentally superior alternative based on applying different weights to various impact areas. For example, one primary area of concern for MBNMS is marine biological resources and potential impacts on these resources from brine discharge and impingement/entrainment. However, in this Final EIR/EIS, MBNMS and CPUC have both identified the same alternative as the environmentally superior/environmentally preferred alternative, and MBNMS has determined that the environmentally preferred alternative is also the NOAA-preferred alternative under NEPA, as discussed in Section 5.6.2, below.

5.6.1 Summary and Comparison of Impacts of Alternatives

While most of the alternatives have impacts that are similar to the proposed MPWSP for most of the topical areas identified in Sections 5.5, there are several impacts that are unique to certain alternatives, or the impacts are more or less severe than the proposed MPWSP, that factor heavily into the selection of the environmentally superior/environmentally preferred alternative. **Table 5.6-1** presents the impact conclusion for each impact statement, for every topical area evaluated, for the proposed project and for all alternatives, and provides a relative impact severity for each alternative (increased, decreased, or same) compared to the proposed project. **Table 5.6-1** also allows for a comparison of the proposed project and other action alternatives to the No Action Alternative; beneficial impacts are highlighted in green.

5.6.1.1 Overview and Assumptions

The alternatives evaluated in this EIR/EIS would produce different quantities of water and are placed into three categories: (a) those that would produce <u>more</u> water than CalAm needs to meet the project objectives/purpose and need (Alternatives 3 and 4); (b) those that would produce <u>less</u> water (Alternatives 5a and 5b), and; (c) those that would produce the same water as the proposed project (Alternatives 1 and 2). The alternatives that provide more water than the proposed project have been sized by their proponents to serve regional needs and that is acknowledged in the comparisons. The alternatives that are smaller than the proposed project would not completely meet the project purpose and need for water, but would reduce the severity of impacts commensurate with their smaller capacities. Since the GWR project EIR was certified and approved by the MRWPCA in October 2015, and the CPUC in September 2016 authorized CalAm to purchase 3,500 afy of the GWR supply for extraction from the Seaside Groundwater Basin, GWR is assumed in the No Action alternative and analyzed as a cumulative project with several of the alternatives, including the 6.4 mgd desalination plant in Alternatives 5a and 5b. While CalAm is seeking approval of the 9.6 mgd project (proposed project), CalAm proposes to move forward with a 6.4 mgd desalination plant (Alternative 5a and 5b) if the GWR project is successfully implemented. In case the GWR project faces hurdles that would impair its ability to supply the additional 3,500 afy of water for CalAm's customers in a timely manner, CalAm also seeks contingency approval for the 9.6 mgd desalination plant. Therefore, in order to make a meaningful comparison, the methodology of choosing the environmentally superior, or preferred alternative, includes the following:

1. The combination of Alternative 5a or 5b with the already-approved GWR project would size these alternatives to meet the purpose and need, and the cumulative environmental effects of the 6.4 mgd desalination plant in combination with the impacts of the GWR project are considered in the comparison, and;
2. Identifying two environmentally superior/environmentally preferred alternatives; one without, and one with the GWR Project.

5.6.1.2 Proposed Project (9.6 mgd MPWSP) Significant Impacts

To provide a basis for comparison, the proposed project would result in the following significant and unavoidable impacts in the issue areas of terrestrial biology, transportation, air quality, noise, and growth-inducement[1]:

- Disturbance within the CEMEX mining facility in areas that are designated as "primary habitat" under the City of Marina Local Coastal Program (LCP), and construction and operation of portions of the Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main, in vegetation communities within the coastal zone designated as primary habitat, would be in conflict with the City of Marina's LCP Land Use Plan (LUP) policies, and; significant contribution to cumulatively inconsistencies with the City of Marina LCPLUP policies.
- Significant cumulative construction impacts on traffic and transportation, given the size of the MPWSP, along with the number of cumulative projects and uncertainty regarding overlap in project construction timing.
- Short-term construction emissions in excess of MBUAPCD significance thresholds for ozone and NO_2 standards on sensitive receptors; associated conflict with the intent of the 2012 Air Quality Management Plan due to these short-term exceedances; and cumulatively considerable contribution to construction emissions.
- Project-specific and cumulative nighttime noise impacts on sensitive receptors from the installation of the Castroville Optional Alignment and drilling and development of the ASR-5 and ASR-6 Wells.
- Indirect growth inducement by removing, to some extent, water supply limitations as an obstacle to growth in CalAm's Monterey District service area. The environmental consequences of this planned growth have been addressed in adopted local plans and the associated CEQA review as well as in other, project-specific, documentation. Some of the identified indirect effects of this growth are significant and unavoidable; others are significant but can be mitigated.
- Cumulatively significant contribution to secondary growth effects in Monterey County including increased traffic, noise, and air pollution and loss of open space and biological resources.

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1 Proposed project impacts from greenhouse gas emissions are no longer considered in this chapter because the impact determination in Section 4.11, Greenhouse Gas Emissions, has been reduced to less than significant with mitigation due to CalAm's commitment to the GHG Reduction Plan.

Alternative 5a, which is a reduced-size project with components at the same locations as the proposed project, would result in the same impacts listed above for the proposed project. However, the severity of impacts would be slightly reduced due to the smaller project size.

None of the alternatives would avoid all of the above-listed significant unavoidable impacts of the proposed project and several alternatives would result in additional significant impacts, as noted below. There were varying degrees of significance in impacts on terrestrial biological resources due to the differences in locations of alternative components. And while the physical impacts on terrestrial biological resources could be mitigated to less than significant, the inconsistency with Marina's LCPLUP policy would remain significant and unavoidable. All of the action alternatives would result in significant and unavoidable construction noise and air quality impacts, including from temporary cumulatively considerable contributions to health effects on sensitive receptors, similar to the proposed project and in some cases, more severe than the proposed project.

5.6.1.3 Key Impact Differences Between Alternatives

The following discussion summarizes key differences in the significant environmental impacts among the alternatives and the proposed project, including consideration of resource impacts that are of particular importance to MBNMS.

Three of the alternatives would use screened, open water intakes, which would reduce or avoid several proposed project impacts but result in new significant impacts. These alternatives would have similar or increased impacts compared to the proposed project with regard to air quality, greenhouse gas (GHG) emissions, traffic, and noise. The key differences in impacts pertaining to open water intakes included in Alternative 2 (Open-Water Intake at Moss Landing), Alternative 3 (DeepWater Desal Project), and Alternative 4 (People's Project), compared to the proposed project include:

- The construction of a new open water intakes would require the use of barges and other activities in the waters of MBNMS, including the placement of ballast rock on the seafloor, and could result in temporary and permanent direct and indirect effects on marine habitat and associated marine biological resources, as well as historical resources (i.e., shipwrecks) in Monterey Bay, resulting in significant and unavoidable impacts.
- The construction and operation of new intake facilities, located within a ravine of the Monterey Submarine Canyon, could result in temporary and permanent direct and indirect effects due to unstable slopes and the potential for landslides on the seafloor as well as alteration of the seafloor and oceanic processes such as sediment transport, resulting in potentially significant impacts.
- Operation of screened open-water intakes would result in long-term direct and indirect effects on marine biological resources within MBNMS in Monterey Bay as a result of impingement and entrainment, resulting in a significant and unavoidable impact.
- Operation of these open water intake alternatives would avoid less than significant direct or indirect effects on groundwater resources because of the absence of slant well pumping for source water.

The following impacts are unique to Alternative 3 (DeepWater Desal Project) and Alternative 4 (People's Project):

- Due to the proximity of live-aboard boats in Moss Landing Harbor, construction activities would result in exposure of more sensitive receptors to substantial pollutant concentrations from construction equipment emissions, resulting in a significant and unavoidable impact.
- Alternatives 3 and 4 would have potentially significant and unavoidable impacts related to PM_{10} emissions, which could result in significant and unavoidable environmental justice impacts.
- Operation of a new, brine-only outfall (no co-mingling with wastewater or other diluent flows) could result in long-term direct and indirect effects on water quality related to increased levels of salinity and concentrations of certain constituents, resulting in a significant and unavoidable impact.
- Each of these alternatives would produce more desalinated water than the proposed MPWSP, resulting in more water being available that would remove an impediment to growth in the three-county region resulting in a significant and unavoidable impact:
    - Alternative 3 (DeepWater Desal) would produce 22 mgd
    - Alternative 4 (People's Project) would produce 12 mgd

The following impacts are unique to Alternative 3 (DeepWater Desal Project):

- Operation of the co-located data center and emergency generators would result in substantial total net operation GHG emissions resulting in a significant and unavoidable impact.
- Operation of the co-located data center would require the use of substantial quantities of energy that would constrain local or regional supplies and require additional capacity, resulting in a significant and unavoidable impact.
- Operation of emergency generators would use large amounts of fuel in a manner that would be unnecessary and wasteful, resulting in a significant and unavoidable impact.

The following impacts are unique to Alternative 4 (People's Project):

- Construction of the desalination plant could impact (currently unsurveyed) historical resources, resulting in a significant and unavoidable impact.
- Operation and siting of the intake pumping facilities on top of the existing caisson at the existing shoreline could result in long-term direct effects on coastal erosion and scour processes that could expose adjacent properties to coastal flooding and a change in sediment transport, resulting in potentially significant impacts.
- Operation and siting of the desalination plant facilities within a 100-year flood zone could cause long-term direct effects related to redirection of flood flows, resulting in a significant and unavoidable impact.
- Operation and siting of the intake pumping facilities on top of the existing caisson would result in impacts on the visual quality of the shoreline in Moss Landing and interrupt views of MBNMS resources, resulting in potentially significant impacts.

The following impact would be unique to slant well pumping at Potrero Road (Alternative 1 and 5b):

- Operation of the slant wells at Potrero Road for a 6.4 mgd desalination plant (Alternative 5b) would lower groundwater levels in the Dune Sands/Perched-A aquifer in the Moss Landing area; operation of the wells for a 9.6 mgd desalination plant (Alternative 1) would additionally lower groundwater levels in the 180- and 400-Foot Aquifers, thereby capturing groundwater that would have otherwise flowed into Elkhorn Slough. The direct and indirect permanent effects on marine and terrestrial biological resources at Elkhorn Slough from the lowering of groundwater levels would result in significant and unavoidable impacts.

5.6.2 Determination of Environmentally Superior/ Environmentally Preferred and NOAA-Preferred Alternative

Based on current information, Alternatives 3 and 4 would each produce more water than the proposed MPWSP and while they would each meet most of the project objectives and purpose and need, these alternatives would not generally reduce or avoid the potential significant environmental impacts of the proposed MPWSP. Both alternatives would have a greater impact on the seafloor and generally on marine biological resources within MBNMS than the proposed project as a result of new screened open water intake and outfall structures, and Alternative 3 would use substantially more energy (because of the co-located data center) that would result in increased air quality and GHG impacts. In addition, the water that these alternatives would produce would exceed CalAm's needs, and would be available for use in the region. That use is unknown and could eliminate an impediment to growth which would result in additional impacts. For these reasons, neither Alternative 3 nor Alternative 4 is the environmentally superior/environmentally preferred alternative.

The proposed project, Alternative 1 (Slant Wells at Potrero Road), and Alternative 2 (Open Water Intake at Moss Landing) would each provide 9.6 mgd of desalinated water and each would meet the project objectives and purpose and need. Alternative 2 would have greater impacts on the seafloor than the proposed project or Alternative 1, as a result of the construction of a new intake, and operation of an open water intake would result in long-term marine biological impacts from impingement and entrainment. The operational impacts would be mitigable, but the proposed project and Alternative 1 would avoid the impacts by using subsurface intakes. The impacts of the subsurface intakes at Potrero Road (Alternative 1), however, would have a greater impact on groundwater levels in the Dune Sands, 180- and 400-Foot Aquifers, resulting in greater impacts on marine and terrestrial biological resources at Elkhorn Slough than pumping at CEMEX (proposed project). Therefore, neither Alternative 1 nor Alternative 5b would offer overall environmental advantages over the proposed project or reduced-size alternative (Alternative 5a).

Alternative 5b (Reduced Desal with Slant Wells at Potrero Road) would have similar but reduced groundwater level impacts at Elkhorn Slough in the Dune Sands Aquifer compared to Alternative 1. Although it would avoid impacts on marine and terrestrial biological resources at the proposed CEMEX site, the impacts on Elkhorn Slough biological resources were determined to be of greater magnitude. Therefore, Alternative 5b would not offer overall environmental advantages over the proposed project or Alternative 5a.

The proposed project would offer the following environmental advantages over other alternatives of the same or larger size (Alternatives 1, 2, 3, and 4):

- Use of an existing outfall and co-mingling of brine with wastewater;
- No construction on the seafloor;
- Meets Ocean Plan Water Quality objectives for salinity within a very short distance;
- Avoids impingement and entrainment of marine organisms associated with an open water intake;
- Less than significant impacts on groundwater resources, surface water resources and marine biological resources; and
- Consistency with the Ocean Plan and MBNMS Desalination Guidelines.

While the proposed project would cause significant and unavoidable construction impacts on air quality and cumulative traffic during construction, the construction impacts would be temporary. While the proposed slant wells at CEMEX would be inconsistent with the City of Marina's LCPLUP policy (and thereby would therefore also result in a significant and unavoidable cumulative impact on terrestrial biological resources when considered with the test slant well at the CEMEX site), Coastal Act Section 30260 encourages coastal-dependent industrial uses and provides for resolution of conflicting Coastal Act policies where such development is concerned. Therefore, the proposed project would be the environmentally superior/environmentally preferred alternative that meets the project objectives and purpose and need without the GWR Project.

Alternative 5a would result in similar environmental advantages (see above) and would result in a reduced severity of some of the potential impacts of the proposed project (smaller footprint, less energy, reduced impacts on groundwater levels). But, as a standalone project, it would not meet the project objectives or purpose and need in terms of providing adequate water supply in the CalAm Monterey District Service Area. Assuming that the GWR Project is implemented and producing water, the combination of Alternative 5a and GWR would meet the project objectives. The cumulative effects of Alternative 5a and GWR may be greater for some of the construction-related impacts (air quality, traffic, noise), and some of the footprint-related impacts (all of the GWR facility footprints plus the footprint of Alternative 5a) and some impacts would remain the same (inconsistency with City of Marina LCPLUP policy). However, some of the operational impacts would be reduced compared to the proposed project because the 3,500 afy provided by the GWR Project would require less energy than producing it by desalination, resulting in reduced impacts on air quality. The reduced capacity desalination plant would require less source water from the slant wells, resulting in a reduction in the severity of impacts on groundwater levels, and the GWR Project would provide additional irrigation supplies to CSIP that would benefit the groundwater basin. For these reasons, assuming that the GWR Project is fully funded and successfully implemented so as to meet its purposes, Alternative 5a would be the environmentally superior alternative under CEQA, the environmentally preferred alternative under NEPA and the NOAA-preferred alternative.

Given a choice between the proposed MPWSP and Alternative 5a paired with the GWR Project, this EIR/EIS identifies Alternative 5a as the environmentally superior/environmentally preferred and NOAA-preferred alternative. While it is true that implementing Alternative 5a and the GWR Project would result in a larger facility footprint than the proposed project alone, the pairing of Alternative 5a and the GWR Project would result in reduced operational energy use and reduced impact on air quality compared to the proposed project. Not only would the combination of Alternative 5a and the GWR Project result in reduced effects on groundwater levels influenced by fewer slant wells and less volume of pumping, the GWR Project would provide water to the CSIP growers that would benefit the groundwater basin. In addition, Alternative 5a paired with the GWR Project would be consistent with the 2016 California Action Plan seeking integrated water supply solutions, the Governor's drought proclamations, the CPUC Water Action Plan goal of promoting water infrastructure investment, and the Ocean Plan and MBNMS Desalination Guidelines.

TABLE 5.6-1
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.2: Geology, Soils, and Seismicity							
Impact 4.2-1: Substantial soil erosion or loss of topsoil during construction.	**LSM**	**NI** ↓	**LSM** ↑	**LSM** ↑	**LSM** ↑	**LSM** ↑	**LSM** ↓
Impact 4.2-2: Exposure of people or structures to substantial adverse effects related to fault rupture.	**LS**	**NI** ↓	**LS** =	**LS** =	**LS** =	**LS** =	**LS** =
Impact 4.2-3: Exposure of people or structures to substantial adverse effects related to seismically-induced groundshaking.	**LS**	**NI** ↓	**LS** =	**LS** =	**LS** =	**LS** =	**LS** =
Impact 4.2-4: Exposure of people or structures to substantial adverse effects related to seismically-induced ground failure, including liquefaction, lateral spreading, or settlement.	**LS**	**NI** ↓	**LS** =	**LS** =	**LS** =	**LS** =	**LS** =
Impact 4.2-5: Exposure of people or structures to substantial adverse effects related to landslides or other slope failures.	**LS**	**NI** ↓	**LS** =	**LS** =	**LS** =	**LS** =	**LS** =
Impact 4.2-6: Exposure of people or structures to substantial adverse effects related to expansive soils.	**LS**	**NI** ↓	**LS** =	**LS** =	**LS** =	**LS** =	**LS** =
Impact 4.2-7: Exposure of structures to substantial adverse effects related to corrosive soils.	**LS**	**NI** ↓	**LS** =	**LS** =	**LS** =	**LS** =	**LS** =
Impact 4.2-8: Exposure of people or structures to substantial adverse effects related to land subsidence.	**NI**	**NI** ↓	**NI** =	**NI** =	**NI** =	**NI** =	**NI** =
Impact 4.2-9: Exposure of people or structures to substantial adverse effects related to alternative wastewater disposal systems.	**LS**	**NI** ↓	**LS** =	**LS** ↓	**LS** ↓	**LS** ↓	**LS** =
Impact 4.2-10: Accelerate and/or exacerbate natural rates of coastal erosion, scour, or dune retreat, resulting in damage to adjoining properties or a substantial change in the natural coastal environment.	**LSM**	**NI** ↓	**NI** ↓	**NI** ↓	**NI** ↓	**SU** ↑	**5a: LSM** = **5b: NI** ↓
Impact 4.2.11: Degrades the physical structure of any geologic resource or alters any oceanographic process, such as sediment transport, that is measurably different from pre-existing conditions.	**NI**	**NI** ↓	**NI** =	**SU** ↑	**SU** ↑	**SU** ↑	**NI** =
Impact 4.2-C: Cumulative impacts related to Geology, Soils, and Seismicity.	**LSM**	**NI** ↓	**LSM** =	**SU** ↑	**LSM** =	**SU** ↑	**LSM** =

TABLE 5.6-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.3: Surface Water Hydrology and Water Quality							
Impact 4.3-1: Degradation of water quality associated with increased soil erosion and inadvertent releases of hazardous chemicals during general construction activities.	LS	LS↓	LS ↑	LS ↑	SU ↑	SU ↑	LS ↓
Impact 4.3-2: Degradation of water quality from construction-related discharges of dewatering effluent from open excavations and water produced during well drilling and development.	LSM	NI ↓	LSM ↑	LSM =	LSM ↑	LSM ↓	LSM ↓
Impact 4.3-3: Degradation of water quality from discharges of treated water and disinfectant from existing and newly installed pipelines during construction.	LS	NI ↓	LS ↑	LS =	LS ↑	LS ↓	5a: LS = 5b: LS ↑
Impact 4.3-4: Violate water quality standards or waste discharge requirements or degrade water quality from increased salinity as a result of brine discharge from the operation of the MPWSP Desalination Plant.	LSM	NI ↓	LSM =	LSM =	LSM ↑	SU ↑	LSM =
Impact 4.3-5: Violate water quality standards or waste discharge requirements or degrade water quality as a result of brine discharge from the operation of the MPWSP Desalination Plant.	LSM	NI ↓	LSM =	LSM =	LSM ↑	SU ↑	LSM =
Impact 4.3-6: Degradation of water quality due to discharges associated with maintenance of the subsurface slant wells and the ASR -5 and ASR-6 Wells.	LS	NI ↓	LS =	LS ↑	LS ↑	LS ↑	LS ↓
Impact 4.3-7: Alteration of drainage patterns such that there is a resultant increase in erosion, siltation, or the rate or amount of surface runoff.	LS	NI ↓	LS ↓	LS ↓	LS ↑	LS ↓	LS =
Impact 4.3-8: Alteration of drainage patterns such that there is an increase in flooding on- or offsite or the capacity of the stormwater drainage system is exceeded.	LS	NI ↓	LS ↑	LS ↓	LS ↑	LS ↓	LS ↓
Impact 4.3-9: Impedance or redirection of flood flows due to the siting of project facilities in a 100-year flood hazard area.	LS	NI ↓	LS ↓	LS =	LS ↓	SU ↑	5a: LS = 5b: LS ↓
Impact 4.3-10: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to a tsunami.	LS	NI ↓	LS ↓	LS =	LS ↓	SU ↑	LS =
Impact 4.3-11: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise.	LS	NI ↓	LS ↓	LS =	LS ↓	SU ↑	LS =
Impact 4.3-C: Cumulative impacts related to Surface Water Hydrology and Water Quality.	LSM	NI ↓	LSM =	LSM =	LSM ↑	SU ↑	LSM =

TABLE 5.6-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.4: Groundwater Resources							
Impact 4.4-1: Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level during construction.	NI	NI =	NI =	NI =	NI =	NI =	NI =
Impact 4.4-2: Violate any water quality standards or otherwise degrade groundwater quality during construction.	LS	NI ↓	LS =	LS ↑	LS ↑	LS ↑	LS =
Impact 4.4-3: Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level during operations so as to expose well screens and pumps.	LS	NI ↓	LS ↓	LS ↓	LS ↓	LS ↓	5a: LS ↓ 5b: LS =
Impact 4.4-4: Violate any water quality standards or otherwise degrade groundwater quality during operations.	LSM	NI ↓	LS ↓	LS ↓	LS ↓	LS ↓	5a: LSM = 5b: LS ↓
Impact 4.4-C: Cumulative impacts related to Groundwater Resources.	LS	NI ↓	NI ↓	NI ↓	NI ↓	NI ↓	5a: LS = 5b NI ↓
Section 4.5: Marine Resources							
Impact 4.5-1: Result in a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any marine species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH); or as identified by the CDFW, USFWS, and/or NMFS during construction	LS	NI ↓	LS ↑	SU ↑	SU ↑	SU ↑	LS ↓
Impact 4.5-2: Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels during construction.	LS	NI ↓	LS ↑	LS ↑	LS ↑	LS ↑	LS ↓
Impact 4.5-3: Interfere substantially with the movement of any native marine resident or migratory fish or marine wildlife species or with established native resident or migratory marine wildlife corridors, or impede the use of native marine wildlife nursery sites during construction.	LS	NI ↓	LS ↑	LS ↑	LS ↑	LS ↑	LS ↓
Impact 4.5-4: Result in a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any marine species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH); or as identified by the CDFW, USFWS, and/or NMFS during operations.	LS	NI ↓	SU ↑	SU ↑	SU ↑	SU ↑	5a: LS = 5b: SU ↑

TABLE 5.6-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.5: Marine Resources (cont.)							
Impact 4.5-5: Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels during operations.	LS	NI ↓	LS =	LS ↑	LS =	LS =	LS ↓
Impact 4.5 6: Interfere substantially with the movement of any native marine resident or migratory fish or marine wildlife species or with established native resident or migratory marine wildlife corridors, or impede the use of native marine wildlife nursery sites during operations.	LS	NI ↓	LS =	LS ↑	LS =	LS =	LS ↓
Impact 4.5-C: Cumulative impacts on Marine Resources.	LS	NI ↓	LS =	SU ↑	NI ↓	SU ↑	LS ↓
Section 4.6: Terrestrial Biological Resources							
Impact 4.6-1: Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification, during construction.	LSM	LSM↓	LSM =	LSM ↓	LSM ↑	LSM =	LSM =
Impact 4.6-2: Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during construction.	LSM	LSM ↓	LSM =	LSM ↓	SU ↑	LSM =	LSM =
Impact 4.6-3: Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the State during construction.	LSM	NI ↓	LSM =	LSM =	LSM ↑	LSM ↑	LSM =
Impact 4.6-4: Be inconsistent with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance with local tree ordinances.	SU	NI ↓	SU ↓	SU =	SU =	SU =	SU =
Impact 4.6-5: Introduce or spread an invasive non-native species during construction.	LSM	LSM ↓	LSM =	LSM =	LSM =	LSM =	LSM =
Impact 4.6-6: Result in substantial adverse effects on candidate, sensitive, or special-status species during project operations.	LSM	↓	LSM =	LSM ↓	LSM =	LSM =	LSM =
Impact 4.6-7: Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during project operations	LSM	↓	SU ↑	LSM ↓	LSM =	LSM =	5a: LSM = 5b: SU ↑
Impact 4.6-8: Result in substantial adverse effects on federal wetlands, federal other waters, and waters of the State during project operations.	LSM	NI ↓	LSM =	NI ↓	LSM =	LSM =	LSM =
Impact 4.6-9: Introduce or spread an invasive non-native species during project operations.	LSM	NI ↓	NI ↓	NI ↓	NI ↓	NI ↓	5a: LSM = 5b: NI ↓

TABLE 5.6-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.6: Terrestrial Biological Resources (cont.)							
Impact 4.6-10: Conflict with the provisions of an adopted Habitat Conservation Plans, natural community conservation plans or other approved local, regional, or state habitat conservation plan.	LSM	NI ↓	LSM =	LSM =	LSM =	LSM =	LSM =
Impact 4.6-C: Cumulative impacts related to Terrestrial Biological Resources.	SU	LS ↓	SU =	SU =	LSM ↓	SU =	SU ↑
Section 4.7: Hazards and Hazardous Materials							
Impact 4.7-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials during construction.	LS	NI ↓	LS ↑	LS ↑	LS ↑	LS ↑	LS ↓
Impact 4.7-2: Encountering hazardous materials from other hazardous materials release sites during construction.	LSM	LSM ↓	LSM =	LSM ↑	LSM ↑	LSM ↑	LSM =
Impact 4.7-3: Project facilities would be located on a known hazardous materials site.	LS	NI ↓	LS =	LS ↑	LS ↑	LS ↑	LS =
Impact 4.7-4: Handle hazardous materials or emit hazardous emissions within 0.25 mile of schools during construction.	LS	NI ↓	LS =	LS =	LS =	LS =	LS =
Impact 4.7-5: Increase risk of wildland fires during construction.	LS	NI ↓	LS =	LS =	LS =	LS =	LS =
Impact 4.7-6: Create a significant hazard to the public or the environment through the routine transport, use, disposal, or accidental release of hazardous materials during project operations.	LS	NI ↓	LS =	LS =	LS ↑	LS ↑	LS ↓
Impact 4.7-C: Cumulative impacts related to Hazards and Hazardous Materials.	LSM	LS ↓	LSM =	LSM ↑	LSM ↑	LSM ↑	LSM =
Section 4.8: Land Use, Land Use Planning, and Recreation							
Impact 4.8-1: Consistency with applicable plans, policies, and regulations related to land use and recreation that were adopted for the purpose of mitigating an environmental effect.	LS	NI ↓	LS =	LS =	LS =	LS =	LS =
Impact 4.8-2: Disrupt or preclude public access to or along the coast during construction.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM = 5b: LSM ↑
Impact 4.8-C: Cumulative impacts related to Land Use, Land Use Planning, and Recreation.	LSM	NI ↓	LSM =	LSM =	LSM =	LSM =	LSM =

TABLE 5.6-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.9: Traffic and Transportation							
Impact 4.9-1: Temporary traffic increases on regional and local roadways due to construction-related vehicle trips.	**LSM**	**NI** ↓	**LSM** ↑	**LSM** ↑	**LSM** ↑	**LSM** ↑	**5a: LSM** = **5b: LSM** ↑
Impact 4.9-2: Temporary reduction in roadway capacities and increased traffic delays during construction.	**LSM**	**NI** ↓	**LSM** ↑	**LSM** ↑	**LSM** ↑	**LSM** ↑	**5a: LSM** = **5b: LSM** ↑
Impact 4.9-3: Increased traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways during construction.	**LSM**	**NI** ↓	**LSM** ↑	**LSM** ↑	**LSM** ↑	**LSM** ↑	**5a: LSM** = **5b: LSM** ↑
Impact 4.9-4: Impaired emergency access during construction.	**LSM**	**NI** ↓	**LSM** ↑	**LSM** ↑	**LSM** ↑	**LSM** ↑	**5a: LSM** = **5b: LSM** ↑
Impact 4.9-5: Temporary disruptions to public transportation, bicycle, and pedestrian facilities during construction.	**LSM**	**NI** ↓	**LSM** ↑	**LSM** ↑	**LSM** ↑	**LSM** ↑	**5a: LSM** = **5b: LSM** ↑
Impact 4.9-6: Increased wear-and-tear on the designated haul routes used by construction vehicles.	**LSM**	**NI** ↓	**LSM** ↑	**LSM** ↑	**LSM** ↑	**LSM** ↑	**5a: LSM** = **5b: LSM** ↑
Impact 4.9-7: Parking interference during construction.	**LSM**	**NI** ↓	**LSM** ↑	**LSM** =	**LSM** =	**LSM** =	**5a: LSM** = **5b: LSM** ↑
Impact 4.9-8: Long-term traffic increases on regional and local roadways during project operations and maintenance.	**LS**	**NI** ↓	**LS** =	**LS** =	**LS** =	**LS** =	**LS** =
Impact 4.9-C: Cumulative impacts related to Traffic and Transportation.	**SU**	**NI** ↓	**SU** =	**SU** =	**SU** =	**SU** =	**SU** =

TABLE 5.6-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.10: Air Quality							
Impact 4.10-1: Generate emissions of criteria air pollutants and contribute to a violation of an ambient air quality standard during construction.	SU	LSM ↓	SU ↑	SU ↑	SU ↑	SU =	SU =
Impact 4.10-2: Construction activities could conflict with implementation of the applicable air quality plan.	SU	NI ↓	SU ↑	SU ↑	SU ↑	SU =	SU =
Impact 4.10-3: Expose sensitive receptors to substantial pollutant concentrations and/or *Coccidioides immitis* (Valley Fever) spores or create objectionable odors affecting a substantial number of people during construction.	LS	NI ↓	LS ↑	LS ↑	SU ↑	SU ↑	LS =
Impact 4.10-4: Long-term increase of criteria pollutant emissions that could contribute to a violation of an ambient air quality standard during operations.	LS	NI ↓	LS =	LS ↑	LSM ↑	LS ↑	LS ↓
Impact 4.10-5: Expose sensitive receptors to substantial pollutant concentrations or create objectionable odors affecting a substantial number of people during operations.	LS	NI ↓	LS =	LS ↑	LSM ↑	LS ↑	LS ↓
Impact 4.10-C: Cumulative impacts related to Air Quality.	SU	LS ↓	SU ↑	SU ↑	SU ↑	SU ↑	SU =
Section 4.11: Greenhouse Gas Emissions							
Impact 4.11-1: Incremental contribution to climate change from GHG emissions associated with the proposed project.	LSM	LSM ↓	LSM ↑	LSM ↑	SU ↑	LSM ↑	LSM ↓
Impact 4.11-2: Conflict with the Executive Order B-30-15 Emissions Reduction Goal.	LSM	NI ↓	LSM ↑	LSM ↑	SU ↑	LSM ↑	LSM ↓
Impact 4.11-3: Conflict with AB 32 Climate Change Scoping Plan.	LSM	NI ↓	LSM ↑	LSM ↑	SU ↑	LSM ↑	LSM ↓
Impact 4.11-C: Cumulative impacts related to Greenhouse Gas Emissions.	LSM	LS ↓	LSM ↑	LSM ↑	SU ↑	LSM ↑	LSM ↓
Section 4.12: Noise and Vibration							
Impact 4.12-1: Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity during construction.	SU	NI ↓	SU ↑	SU ↑	SU ↑	SU ↑	5a: SU = 5b: SU ↑

TABLE 5.6-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.12: Noise and Vibration (cont.)							
Impact 4.12-2: Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during construction.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM = 5b: LSM ↑
Impact 4.12-3: Exposure of people to or generation of excessive groundborne vibration during construction.	LSM	NI ↓	LSM ↓	LSM ↓	LSM ↓	LSM ↓	5a: LSM = 5b: LSM ↓
Impact 4.12-4: Consistency with the construction time limits established by the local jurisdictions.	LSM	NI ↓	LSM =	LSM =	LSM ↑	LSM =	5a: LSM = 5b: LSM ↓
Impact 4.12-5: Substantial permanent increases in ambient noise levels in the project vicinity above levels existing without the project during operations.	LSM	NI ↓	LSM =	LSM =	LSM ↑	LSM ↑	LSM =
Impact 4.12-6: Expose people to or generate operational noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during operation.	LS	NI ↓	LS =	LS =	LS =	LSM ↑	LS =
Impact 4.12-C: Cumulative impacts related to Noise and Vibration.	SU	NI ↓	SU ↑	SU ↑	SU ↑	SU ↑	5a: SU = 5b: SU ↑
Section 4.13: Public Services and Utilities							
Impact 4.13-1: Disrupt or relocate regional or local utilities during construction.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM = 5b: LSM ↑
Impact 4.13-2: Exceed landfill capacity or be out of compliance with federal, state, and local statutes and regulations related to solid waste during construction.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM = 5b: LSM ↑
Impact 4.13-3 Exceed landfill capacity or be out of compliance with federal, state, and local statutes and regulations related to solid waste during operations.	LS	NI ↓	LS =	LS =	LS ↑	LS ↓	LS =

TABLE 5.6-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.13: Public Services and Utilities (cont.)							
Impact 4.13-4: Exceed wastewater treatment requirements of the Central Coast RWQCB, or result in a determination by the wastewater treatment provider that it has inadequate treatment or outfall capacity to serve the project.	LSM	NI ↓	LSM =	LSM =	LS ↓	LS ↓	LSM =
Impact 4.13-5: Increased corrosion of the MRWPCA outfall and diffuser as a result of brine discharge associated with project operations.	LSM	NI ↓	LSM =	LSM =	NI ↓	NI ↓	LSM =
Impact 4.13-C: Cumulative impacts related to Public Services and Utilities.	LSM	NI ↓	LSM =	LSM =	LSM ↓	LSM ↓	LSM =
Section 4.14: Aesthetic Resources							
Impact 4.14-1: Construction-related impacts on scenic resources (vistas, roadways, and designated scenic areas) or the visual character of the project area and its surroundings.	LS	NI ↓	LS =	LS =	LS =	LSM ↑	LS =
Impact 4.14-2: Temporary sources of substantial light or glare during construction.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	LSM =
Impact 4.14-3: Permanent impacts on scenic resources (vistas, roadways, and designated scenic areas) or the visual character of the project area and its surroundings.	LSM	NI ↓	LSM =	LSM ↓	LSM ↓	LSM =	LSM =
Impact 4.14-4: Permanent new sources of light or glare.	LSM	NI ↓	LSM =	LSM =	LSM ↑	LSM ↑	LSM =
Impact 4.14-C: Cumulative impacts related to Aesthetic Resources.	LSM	NI ↓	LSM =	LSM =	LSM =	LSM =	LSM =
Section 4.15: Cultural and Paleontological Resources							
Impact 4.15-1: Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 of the CEQA Guidelines or historic properties pursuant to 36 CFR 800.5 during construction.	NI	NI =	NI =	NI =	NI =	SU ↑	NI =
Impact 4.15-2: Cause a substantial adverse change during construction in the significance of an archaeological resource pursuant to Section 15064.5 of the CEQA Guidelines or historic properties pursuant to 36 CFR 800.5.	LSM	LSM ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM = 5b: LSM ↑
Impact 4.15-3: Directly or indirectly destroy a unique paleontological resource or site, or unique geological feature during construction.	LS	NI ↓	LS ↑	LS ↑	LS ↑	LS ↑	5a: LS = 5b: LS ↑

TABLE 5.6-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.15: Cultural and Paleontological Resources (cont.)							
Impact 4.15-4: Disturbance any human remains, including those interred outside of formal cemeteries, during construction.	**LSM**	**NI** ↓	**LSM** ↑	**LSM** ↑	**LSM** ↑	**LSM** ↑	**5a: LSM** = **5b: LSM** ↑
Impact 4.15-C: Cumulative impacts related to Cultural and Paleontological Resources.	**LS**	**LS** ↓	**LS** =	**LSM** ↑	**LSM** ↑	**LSM** ↑	**LSM** =
Section 4.16: Agricultural Resources							
Impact 4.16-1: Result in changes in the existing environment that, due to their location or nature, could temporarily disrupt agricultural activities or result in the permanent conversion of farmland to non-agricultural use.	**LSM**	**NI** ↓	**LSM** =	**LSM** =	**LSM** ↑	**NI** ↓	**LSM** =
Impact 4.16-2: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use.	**LS**	**NI** ↓	**LS** =	**LS** =	**LS** ↑	**NI** ↓	**LS** =
Impact 4.16-3: Conflict with zoning for agricultural uses or with Williamson Act contracts.	**LS**	**NI** ↓	**LS** =	**LS** =	**LS** ↑	**NI** ↓	**LS** =
Impact 4.16-C: Cumulative impacts related to Agricultural Resources.	**LSM**	**NI** ↓	**LSM** =	**LSM** =	**LSM** ↑	**NI** ↓	**LSM** =
Section 4.17: Mineral Resources							
Impact 4.17-1: Loss of availability of known mineral resources that are of value to the region or residents of the state or result in the loss of a locally-recognized important mineral resource recovery site.	**LS**	**NI** ↓	**LS** ↓	**LS** ↓	**LS** ↓	**LS** ↓	**5a: LS** = **5b: LS** ↓
Impact 4.17-C: Cumulative impacts related to Mineral Resources.	**LS**	**NI** ↓	**LS** ↓	**LS** ↓	**LS** ↓	**LS** ↓	**5a: LS** = **5b: LS** ↓

TABLE 5.6-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Section 4.18: Energy Conservation							
Impact 4.18-1: Use large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during construction.	LSM	NI ↓	LSM ↑	LSM ↑	LSM ↑	LSM ↑	5a: LSM ↓ 5b: LSM ↑
Impact 4.18-2: Use large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during operations.	LS	NI ↓	LS ↑	LS ↑	LS ↑	LS ↑	LS ↓
Impact 4.18-3: Constrain local or regional energy supplies, require additional capacity, or affect peak and base periods of electrical demand during operations.	LS	NI ↓	LS ↑	LS ↑	SU ↑	LS ↑	LS ↓
Impact 4.18-C: Cumulative impacts related to Energy Resources.	LSM	NI ↓	LSM ↑	LSM ↑	SU ↑	LSM ↑	5a: LSM ↓ 5b: LSM ↓
Section 4.19: Population and Housing							
Impact 4.19-1: Induce substantial population growth directly during project construction.	LS	NI ↓	LS =	LS =	LS =	LS =	LS =
Impact 4.19-2: Induce substantial population growth directly during project operations.	LS	NI ↓	LS =	LS =	LS =	LS =	LS =
Impact 4.19-C: Cumulative impacts related to Population and Housing.	LS	NI ↓	LS =	LS =	LS =	LS =	LS =
Section 4.20 Socioeconomics and Environmental Justice							
Impact 4.20-1: Reductions in the rate of employment, total income, or business activity in Monterey County.	LSM	SU ↑	LSM =	LSM =	LSM =	LSM =	LSM =
Impact 4.20-2: Disproportionately high and adverse effects on low-income or minority populations.	LS	SU ↑	LS =	LS ↓	SU ↑	SU ↑	LS ↓
Impact 4.20-C: Cumulative impacts related to Socioeconomics and/or Environmental Justice.	LSM	SU ↑	LSM =	LSM =	SU ↑	SU ↑	LSM ↓

TABLE 5.6-1 (Continued)
ALTERNATIVES IMPACT SUMMARY

Impact	Proposed Project 10 Slant Wells at CEMEX	No Action	Alt. 1: Slant Wells at Potrero Road	Alt. 2: Open Water Intake at Moss Landing	Alt. 3: Deep Water Desal	Alt. 4: People's Project	Alt. 5: Reduced Size Desal
Growth Inducement							
Impact 6.3-1: Secondary effects of planned growth.	SU	NI ↓	LS ↓	SU ↑	SU ↑	SU ↑	LS ↓
Impact 6.3-C: Cumulative impacts related to growth inducement.	SU	NI ↓	SU ↑	SU ↑	SU ↑	SU ↑	SU =

NOTES:

↑ Increased severity of impact ↓ Decreased severity of impact **=** Same severity of impact

NI – No Impact
LS = Less than Significant impact, no mitigation proposed
LSM = Less than Significant impact with Mitigation
SU = Significant and Unavoidable impact, even with implementation of mitigation
= Beneficial Impact

CHAPTER 6
Other Considerations

Sections	Tables
6.1 Significant and Unavoidable Environmental Effects 6.2 Significant Irreversible Changes and Short-Term versus Long-Term Uses 6.3 Growth-Inducing Impacts 6.4 Project Consistency with Monterey Bay National Marine Sanctuary Desalination Guidelines	6.3-1 MPWSP Demand Assumptions 6.3-2 Monterey District Commercial Sector Water Consumption Water Years 2003 Through 2015 6.3-3 Existing and Anticipated Demand 6.3-4 Water Supplies and Demands During Seaside Groundwater Basin Replenishment Period, 9.6-mgd Desalination Plant with SVGB Return 6.3-5 Range of Flow Volumes Accommodated by Pipeline Segment 6.3-6 Service Area and Monterey County Growth Trends 1990-2010 Population and Housing 6.3-7 AMBAG Population, Housing, and Employment Projections 6.3-8 Future Water Demand and Available Supplies: Two Return Water Scenarios 6.3-9 Significant Impacts Associated with Planned Growth in the Project Area 6.3-10 Agencies with the Authority to Implement or Require Implementation of Measures to Avoid or Mitigate Growth-Related Impacts 6.4-1 Assessment of Project Conformity with Guidelines for Desalination Plants in Monterey Bay National Marine Sanctuary

This chapter addresses other considerations required by CEQA and NEPA, including the potential for the proposed project to have unavoidable significant impacts; the irreversible or irretrievable commitment of resources; the relationship between short-term uses of the project and long-term productivity; growth-inducing effects of the project; and project consistency with MBNMS Desalination Guidelines.

6.1 Significant and Unavoidable Environmental Effects

Section 15126.2(b) of the CEQA Guidelines requires that an EIR identify significant environmental effects that cannot be avoided by the proposed project, including those that can be mitigated, but not to a less-than-significant level. CEQ Regulations 40 CFR Section 1502.16 states that the EIS environmental analysis shall include any adverse environmental effects which cannot be avoided should the proposal be implemented. The analysis in Chapter 4 identifies all adverse impacts associated with the proposed project/proposed action and those impacts that cannot be avoided. The analysis in Chapter 4 determined that the proposed project would result in impacts related to noise, air quality, terrestrial biological resources, and cumulative traffic impacts that, even with implementation of mitigation measures, would remain significant and unavoidable. These impacts are summarized below:

- Nighttime noise impacts on residential receptors during installation of the Castroville Pipeline Optional Alignment 1 and during drilling and development of the ASR-5 and ASR-6 Wells would remain significant and unavoidable, even with implementation of mitigation measures. See Section 4.12, Noise and Vibration, for additional information on this impact.
- Nighttime construction could contribute to a significant unavoidable cumulative impact. In the absence of detailed information regarding cumulative project construction equipment and exact construction phase timing, a quantitative assessment of cumulative nighttime noise impact cannot be reasonably estimated. However, it is conservatively assumed that the potential exists for residual (post-mitigation) MPWSP pipeline construction noise to combine with that of one or more of five cumulative projects in Table 4.1-2 (Nos. 31, 35, 38, 45, and 51) to cause nighttime noise levels to exceed the sleep interference threshold. As a result, temporary cumulative increases in nighttime construction noise could result in a significant cumulative nighttime noise impact. No additional mitigation within the scope of this EIR/EIS is available to further reduce this potential impact. Therefore, MPWSP nighttime construction noise could have a significant contribution to a significant cumulative effect. See Section 4.12, Noise and Vibration, for additional information on this impact.
- Short-term air emissions associated with construction of the proposed project could contribute to an exceedance of state and/or federal standards for ozone and NO_x, which could increase the susceptibility of sensitive individuals to respiratory infections and is a significant impact. Such exceedances in ozone would also be inconsistent with the Monterey Bay United Air Pollution Control District's 2012 Air Quality Management Plan (AQMP). Implementation of mitigation measures would not reduce project-related NO_x emissions (a precursor to ozone) to a level below the significance threshold, therefore resulting in significant and unavoidable impacts with regard to violations of air quality standards and compliance with the AQMP. See Section 4.10, Air Quality, for additional information on these impacts.
- Project construction NO_x emissions, in combination with cumulative project emissions, would violate ambient air quality standards and conflict with implementation of the applicable air quality plan, even with implementation of mitigation measures**.** The proposed project's incremental contribution to the cumulative impact would be significant. No further feasible mitigation measures are available to reduce the project's contribution to cumulative impacts.
- Several proposed facilities would occur in areas that may qualify as Primary and Secondary Habitat according to the City of Marina Local Coastal Land Use Plan (LCLUP). These facilities, which include the subsurface slant wells, and portions of the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, and the staging area at Beach Road, would be inconsistent with the City of Marina's LCLUP Policy 25 that prohibits development in Primary Habitat that is not protective of and dependent upon that habitat. The LCLUP states, "Primary habitat areas shall be protected and preserved against any significant disruption of habitat values and only uses dependent on those resources shall be allowed within those areas (City of Marina, 1982)." Implementation of mitigation

measures would reduce impacts on special-status species habitat. However, given that project facilities proposed for such habitats are not resource-dependent, and because the LCLUP policy provides no exception to the requirements that development within such habitats be resource-dependent, potential conflicts with this policy would remain unresolved. The effect would be significant and unavoidable. See Section 4.6, Terrestrial Biological Resources, for additional information.

- As described above, construction of some of the proposed components would be inconsistent with the City of Marina LCLUP Policy 25. The test slant well at the CEMEX site is a cumulative project that is within the geographic scope of this analysis. The test slant well was also determined to be inconsistent with the City of Marina LCLUP. Implementation of the proposed project would have a significant contribution to the cumulative impact related to inconsistencies with the City of Marina LCLUP. No mitigation measures are available that would reduce this impact to less than significant. See Section 4.6, Terrestrial Biological Resources, for additional information.
- Given the size of the MPWSP, along with the number of cumulative projects and uncertainty regarding cumulative project construction timing, the MPWSP transportation impacts could contribute substantially to cumulative local and regional traffic and roadway capacity disruptions, a cumulatively significant impact. Implementation of Mitigation Measure 4.9-C (Construction Traffic Coordination Plan), could reduce cumulative impacts, however there is no guarantee that local agencies would participate in such coordination efforts. Therefore, the project’s incremental contribution to potential significant cumulative effects would be significant, even with implementation of mitigation measures. See Section 4.9, Traffic and Transportation, for additional information.
- The proposed project would indirectly support growth by removing some water supply limitations as an obstacle to growth, thereby enabling a degree of growth under the approved general plans within the area served by the MPWSP. The project’s effect would be significant and unavoidable and its contribution to cumulative indirect growth-inducement would also be significant and unavoidable. See Section 6.3, Growth-Inducing Impacts, for additional information.

6.2 Significant Irreversible Changes and Short-Term versus Long-Term Uses

In accordance with CEQA Section 21100(b)(2)(B), CEQA Guidelines Sections 15126(c) and 15126.2(c), and CEQ Regulations 40 CFR Section 1502.16, the purpose of this section is to identify significant irreversible environmental changes and commitments of resources that would be caused by implementation of the proposed project. In addition, NEPA (40 CFR §1502.16) requires an EIS to include analysis of the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity.

6.2.1 Irreversible Changes

A resource commitment is considered irreversible when primary or secondary impacts from its use limit future use options. Irreversible commitment applies primarily to nonrenewable resources, such as minerals or cultural resources, and to those resources that are renewable only over long time spans, such as soil productivity. A resource commitment is considered irretrievable when the use or consumption of the resource is neither renewable nor recoverable for use by future generations. Irretrievable commitment applies to the loss of production, harvest, or natural resources. The proposed project would involve two types of resources: (1) general industrial resources including fuels and construction materials; and (2) project-specific resources such as land, biotic and cultural resources at the project facility sites. This section identifies any resources that would be lost permanently as a result of undertaking the project.

Implementation of the proposed project would result in a significant irreversible commitment of natural resources during construction and operation through the use of fossil fuels, energy and materials such as concrete, steel, and plastics.

During the life of the project, the land used for the facilities would be committed to the project. Project components, including the slant wells, desalination plant, ASR-5 and 6 Wells, and Carmel Valley Pump Station, would permanently occupy approximately 30 acres of land, via physical siting and security fencing. This land could be used for other purposes in the future; however, the baseline condition of the land would either be irretrievable or renewable in an undeterminable timeframe. Siting of the slant wells would displace sensitive dune habitat and designated mineral resources; the desalination plant would displace non-native grassland; the ASR-5 and 6 Wells could displace central maritime chaparral plant communities, including special-status species; and the Carmel Valley Pump Station site could displace non-native grassland with coastal live oak woodland fringe.

Accidents, such as the release of hazardous materials, could trigger irreversible environmental damage. As discussed in Section 4.7, Hazards and Hazards Materials, construction and operation of the proposed project would involve limited quantities of miscellaneous hazardous substances, such as gasoline, diesel fuel, solvents, paints, and other chemicals. An accidental spill of any of these substances could affect water and/or groundwater quality and, if a spill were to occur of significant quantity, the release could pose a hazard to construction workers, the public, and the environment. Improper storage, use, handling, or accidental spilling of such materials could result in a hazard to the public or the environment. However, compliance with the various regulations regarding the safe transport, use, and storage of hazardous materials (see Section 4.7.2, Regulatory Framework) as well as the National Pollutant Discharge Elimination System General Construction Permit requirements would ensure that public health and safety risks are maintained at acceptable levels. Therefore, significant irreversible changes from accidental releases are not anticipated.

6.2.2 Short-Term versus Long-Term Uses

This section compares the short- and long-term environmental effects of the project. Short-term impacts would result from constructing the various project components. These actions would result in temporary adverse impacts related to soils, air quality, terrestrial biology, water quality, noise, hazardous materials, traffic and transportation, aesthetics, agriculture, energy consumption, and the daily influx of construction workers. The siting and operation of various project components could result in long-term adverse impacts related to terrestrial biological resources, greenhouse gas emissions and the indirect effects of induced growth. All of these short-term and long-term impacts are addressed in Chapter 4 and feasible mitigation measures are identified that would result in a reduction of many impacts to a less than significant level. On balance, impacts would not substantially affect the maintenance and enhancement of long-term environmental productivity, nor pose long-term risks to health or safety.

6.3 Growth-Inducing Impacts

6.3.1 Introduction

This section addresses the indirect growth inducement potential of the proposed MPWSP. Refer to Section 4.19, Population and Housing, for an analysis of the MPWSP's potential direct effects on growth[1]. Direct and indirect growth-inducing effects of the alternatives are addressed in Section 5.5. This section describes the relationship between land use planning and water supply; identifies the regulatory framework for the analysis; describes the assumptions used in the analysis; and discloses the MPWSP's potential to induce growth indirectly. The study area for this analysis consists of the area that would be served by the proposed project – CalAm's Monterey District service area (Monterey District)– which encompasses most of the Monterey Peninsula, and Monterey County. In particular, the MPWSP would provide water supply to customers served by the Monterey District main distribution system and three small satellite water systems, the Ryan Ranch, Hidden Hills, and Bishop systems. The main distribution system serves the cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and most of the City of Seaside; the Monterey Peninsula Airport District; and the unincorporated county areas of Carmel Highlands, Carmel Valley, Pebble Beach, and the Del Monte Forest. The analysis also evaluates the proposed delivery of Salinas Valley Groundwater Basin Return Water to the community of Castroville.

Growth can be induced in several ways, such as through the elimination of obstacles to growth, through the stimulation of economic activity within the region, or through the establishment of policies or other precedents that directly or indirectly encourage additional growth. In general, a project may foster spatial, economic, or population growth in a geographic area if the project removes an impediment to growth (for example, the establishment of an essential public service, the provision of new access to an area; a change in zoning or general plan amendment approval); or economic expansion or growth occurs in an area in response to the project (for example, changes in revenue base, employment expansion, etc.).

Assessing the MPWSP's potential to indirectly induce growth means determining whether the project would indirectly support economic expansion, population growth, or residential construction, and if so, determining the magnitude and nature of the potential environmental effects of that growth.

The objectives of the MPWSP include development of water supply to enable CalAm to replace Carmel River and Seaside Groundwater Basin supplies that are currently diverted and pumped in excess of CalAm's legal rights; development of a reliable water supply for its Monterey District

1 "Direct effects" of a proposed project are "caused by the [action or project] and occur at the same time and place," while "indirect or secondary effects" are "caused by" the action or project and are "later in time or farther removed in distance, but are still reasonably foreseeable." (CEQA Guidelines § 15358(a))

service area; and provision of sufficient water supply to serve existing vacant lots of record and accommodate tourism demand under recovered economic conditions. Water supply is one of the primary public services needed to support urban development. A water service deficiency could constrain future development, particularly if coupled with policies that constrain growth relative to water supply. Adequate water supply would play a role in supporting additional growth in CalAm's service area, but it would not be the single impetus behind such growth. Other factors that influence new development and population growth on the Monterey Peninsula include economic factors such as employment opportunities; the availability of adequate infrastructure like public schools, roadways, and sewer service; local land use policies in the affected communities; and constraints on the use of areas like floodplains and sensitive habitats.

6.3.2 Relationship between Land Use Planning and Water Supply

There is a connection between land use planning and water supply. In California, cities and counties have primary authority over land use while water suppliers, through laws and agreements, are expected – and usually required – to provide water service if water supply is available. In the areas served by CalAm, it is the responsibility of the cities or Monterey County to approve or deny development proposals. In addition, on the Monterey Peninsula, the MPWMD is responsible for allocating water to the jurisdictions within its boundary (which includes the CalAm service area), issuing water permits, and approving new water distribution systems or expansions. Therefore, when deciding whether to approve or deny development projects, including whether water would be available to serve the projects, the jurisdictions within the MPWMD's boundary take into account the MPWMD's allocation and distribution determinations and permits. Numerous laws ensure that water supply planning and land use planning proceed in an orderly fashion. The laws and agencies described below provide the regulatory and planning context in which water agencies, cities, and counties work together and produce key documents (e.g., general plans and regional projections) used in this analysis.

6.3.2.1 Regional Planning and Local Planning

AMBAG

The Association of Monterey Bay Area Governments (AMBAG) is the key regional agency involved in forecasting growth in Monterey County. Although AMBAG can forecast growth, it does not have authority to approve or deny land use plans or development projects. AMBAG is a Joint Powers Authority that serves as the federally-designated Metropolitan Planning Organization and Council of Governments for Monterey, Santa Cruz and San Benito Counties. It is governed by a Board of Directors made up of elected officials from each city and county in the region. AMBAG undertakes metropolitan-level transportation planning on behalf of the region; manages the region's transportation demand model; and prepares regional housing, population and employment forecasts that are used in a variety of regional plans (AMBAG, 2013). AMBAG's regional growth forecast, which it produces approximately every five years, supports regional planning efforts such as the Metropolitan Transportation Plan, and may be used by city and county governments in support of local planning efforts such as the development of general plans and project review. The 2004 and 2008 forecasts describe how the existing water and sewer infrastructure constrains growth (AMBAG, 2004, 2008). AMBAG adopted a different methodology for its current (2014) forecast, which emphasizes employment growth as the primary driver of long-term population change at a regional scale. The 2014 forecast includes population, housing, and employment projections out to the year 2035 (AMBAG, 2014a). While AMBAG does not have authority to approve or deny land use plans, it does direct regional growth decisions by setting state-mandated fair-share regional housing allocations in Monterey and Santa Cruz Counties and their respective cities.[2]

General Plan Requirements

Under state law,[3] each city and county must adopt a comprehensive, long-term general plan for the physical development of the jurisdiction. The general plan is a statement of development policies, and must include land use, circulation, housing, conservation, open space, noise, and safety elements. The land use element designates the general distribution, location, and extent of land uses, and includes a statement of the standards of population density and building intensity recommended for lands covered by the plan. The city or county must prepare the water section of the conservation element in coordination with any countywide water agency and with all district and city agencies that have developed, served, controlled, managed, or conserved water of any type for any purpose in the county or city for which the general plan is prepared. Coordination among relevant agencies is required to include the discussion and evaluation of any water supply and demand information contained in any applicable urban water management plan, current capital improvement program, and related supply and demand information that has been submitted to the city or county by a water agency.[4]

6.3.2.2 Coordination of Land Use Planning and Water Supply

Urban Water Management Planning Act

The Urban Water Management Planning Act[5] requires every urban water supplier to prepare an urban water management plan (UWMP) for the purpose of "actively pursu[ing] the efficient use of available supplies."[6] In preparing the UWMP, the water supplier must coordinate with other appropriate agencies, including other water suppliers that share a common source, water management agencies, and relevant public agencies. When a city or county proposes to adopt or substantially amend a general plan, the water agency must provide the planning agency with the current version of the adopted UWMP, the current version of the water agency's capital improvement program or plan, and other information about the system's sources of water supply. The Urban Water Management Planning Act requires urban water suppliers, as part of their long-range planning activities, to make every effort to ensure the appropriate level of reliability in their

[2] San Benito County is responsible for setting the fair share regional housing allocation for the cities and unincorporated area in that county.
[3] California Government Code § 65300 *et seq.*
[4] California Government Code § 65302(d)(1).
[5] California Water Code §10610 *et seq.*
[6] California Water Code §10610.4(c).

water service sufficient to meet the needs of their various categories of customers during normal, dry, and multiple dry water years.[7]

Senate Bills (SB) 610 and 221

SB 610[8] and SB 221[9] were companion legislative measures that took effect in January 2002. They require increased efforts to identify and assess the reliability of anticipated water supplies, and require increased levels of communication between municipal planning authorities and local water suppliers.

- **SB 610** requires that the CEQA documents for most large projects[10] (including those that generate water demand greater than an equivalent of 500 dwelling units or increase service connections by 10 percent) include a water supply assessment. A water supply assessment must address whether existing water supplies will suffice to serve the proposed project and other planned development over a 20-year period in average, dry, and multiple-dry year conditions, and must set forth a plan for finding additional supplies necessary to serve the proposed project. Cities and counties can approve projects notwithstanding identified water supply shortfalls if they address those shortfalls in their findings.
- **SB 221** applies when cities and counties approve new tentative subdivision maps. When they do so, the cities and counties must impose a condition on the developers, requiring them to provide a detailed, written verification from the applicable water supplier that sufficient water supply will be available to serve the proposed subdivision. Without that verification, the cities and counties cannot approve the final subdivision map. SB 221 applies to projects similar in size to those addressed in SB 610.

Senate Bill 7 of the Seventh Extraordinary Session (Senate Bill 7)

Enacted in November 2009, Senate Bill 7[11] requires all water suppliers in the State to increase the efficiency of water use. Urban water suppliers like CalAm must reduce per capita water consumption 20 percent by 2020, and must set and achieve interim targets by 2015.

State Policies Encouraging Compact and Sustainable Development

In addition to the laws promoting coordinated land use and water supply planning, several recent laws have been adopted that seek to refocus planning efforts to reduce sprawl, preserve farmland, increase the viability of public transportation, and reduce the emission of greenhouse gases. These efforts promote compact and sustainable development, which allows for the more efficient provision of public services and reduces the consumption of resources, including water. One of the cornerstones of sustainable development is efficient water use. This includes water

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7 California Water Code §10610.2(a)(4)

8 Codified at California Water Code §§ 10631, 10656, 10910, 10911, 10912, and 10915, and California Public Resources Code § 21151.9.

9 Codified at California Government Code §§ 65867.5, 66455.3, and 66473.7, and California Business and Professions Code § 11010.

10 Large projects include residential developments with more than 500 units; retail uses with more than 500,000 square feet of floor space; office buildings with more than 250,000 square feet of floor space; hotels or motels with more than 500 rooms; industrial uses occupying more than 40 acres or having more than 650,000 square feet of floor area; and mixed-use projects that include any use or combination as large as the above uses.

11 Codified at California Water Code §§ 10608 and 10800-10853.

conservation and efficiency measures such as using recycled water, installing water efficient fixtures, and putting in drought-tolerant landscaping.

- **Assembly Bill (AB) 32,**[12] the Global Warming Solutions Act of 2006, was adopted with the goal of reducing greenhouse gas emissions to 1990 levels by the year 2020. Under the Act, the California Air Resources Board (CARB) adopted a scoping plan that identifies measures to reduce the energy requirements of significant greenhouse gas sources, including those associated with providing reliable water supplies. These measures include increasing water use efficiency, recycling water, and improving water system energy efficiency. CARB updated the Scoping Plan CARB in May 2014.
- **SB 375,**[13] adopted in 2008, requires each of the state's MPOs to coordinate land use and transportation planning, and to develop a "Sustainable Communities Strategy" to reduce sprawl, and to reduce greenhouse gas emissions from automobiles and light trucks. AMBAG, the MPO for the three-county region, adopted its combined Metropolitan Transportation Plan/Sustainable Communities Strategy, which is advisory, in June 2014.
- **SB 732,**[14] adopted in 2008, establishes the Strategic Growth Council, a cabinet-level committee that coordinates the activities of State agencies to improve air and water quality, protect natural resources, and assist in the planning of sustainable communities.
- **AB 857,**[15] signed into law in 2002, establishes three planning priorities for the State: promoting infill development, protecting natural resources, and encouraging efficient development patterns. These priorities are to be incorporated into the Governor's Environmental Goals and Policy Report,[16] which provides a 20- to 30-year overview of State growth and development and guides the commitment of State resources in agency plans and infrastructure projects.
- The **Regional Blueprint Planning Program** is a grant program operated by the California Department of Transportation that provides assistance to COGs in developing long-range plans with the intent of supporting greater transit use, encouraging more efficient land use, improving air quality, and protecting natural resources. AMBAG released its blueprint, *Envisioning the Monterey Bay Area: A Blueprint for Sustainable Growth and Smart Infrastructure,* in June 2011.

6.3.2.3 Water Supply Management and Planning: Monterey Peninsula Water Management District

The MPWMD was established by state statute in 1978[17] to provide integrated management of all water resources for the Monterey Peninsula. In doing so, the MPWMD must ensure that the quantity of water use does not harm public trust resources, and that all water use is reasonable and beneficial. The MPWMD manages surface and groundwater resources within its jurisdictional boundary. Its functions include:

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12 Codified at California Health and Safety Code § 38500 *et seq*.
13 Codified by amending California Government Code §§ 65080, 65400, 65583, 65584.01, 65584.02, 65584.04, 65587, and 65588; amending California Public Resources Code § 21061.3; adding Government Code §§ 14522.1, 14522.2 and 65080.01; and adding Public Resources Code §§ 21159.28 and 21155 *et seq*.
14 Codified at California Public Resources Code §§ 75076, 75077, 75100 *et seq.*, and 75120 *et seq.*
15 Codified at California Government Code § 65041.1.
16 Required in California Government Code § 65041.
17 West's California Water Code, Appendix Chapters 118-1 to 118-901.

- augmenting the water supply through integrated management of surface water and groundwater resources;
- promoting water conservation;
- promoting water reuse and reclamation of stormwater and wastewater; and
- fostering scenic values, environmental qualities, native vegetation, fish and wildlife, and recreation on the Monterey Peninsula and in the Carmel River basin.

The MPWMD's responsibilities also include:

- computer modeling of water resources systems;
- hydrologic monitoring;
- issuing water permits for new connections and remodels;
- allocating water to jurisdictions and tracking its use;
- developing, implementing, and enforcing water efficiency programs and ordinances;
- determining when water supply emergencies exist and then imposing and enforcing rationing programs; and
- approving new water distribution systems and expansions.

The MPWMD includes the cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside, as well as the Monterey Peninsula Airport District and portions of unincorporated Monterey County (see Figure 3-1 in Chapter 3). Its boundary encompasses CalAm’s Monterey District as well as other territory east of Carmel Valley Village and in the Ord Community. MPWMD is governed by a seven-member Board of Directors: five directors are elected from voter divisions; one is a member of the County Board of Supervisors; and one is an elected official or chief executive officer appointed by a committee consisting of the mayors from jurisdictions within the District boundaries.

6.3.3 Regulatory Framework

NEPA requires that an EIS discuss the direct and indirect effects of a proposed action. The potential for growth-inducing effects are indirect effects (40 CFR 1508.8). Specifically:

> Effects include:
>
> > Indirect effects, which are caused by the action and are later in time or farther removed in distance [than direct effects], but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

The CEQA Guidelines require that an EIR evaluate the growth-inducing impacts of a proposed project (Section 15126.2(d)). The EIR should:

> Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to

> population growth (a major expansion of a waste water treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.[18]

Economic growth refers to the extent to which a project could cause increased activity in the local or regional economy.

Growth that is induced by a project may be consistent with adopted local or regional land use plans. In that case, a formal CEQA/NEPA review would have identified and evaluated the indirect, or secondary, effects of that planned growth and, if necessary, mitigation would have been adopted to address these effects. If a project would have growth inducement potential that is not consistent with the land use plans and growth management plans and policies for the area affected (e.g., growth beyond that reflected in adopted plans and policies), then additional adverse secondary effects of growth beyond those previously evaluated could occur. Regional and local land use plans provide for land use development patterns and growth policies that allow for the orderly expansion of urban development supported by adequate urban public services, such as water supply, roadway infrastructure, utilities, wastewater, and solid waste service. This urban development may have environmental impacts, as identified in CEQA documents prepared for adoption of local land use plans. A project that would induce “disorderly” growth that conflicts with regional and local planning could indirectly cause additional adverse environmental impacts and impacts on other public services. Thus, it is important to assess the degree to which the growth associated with a project would be consistent with regional and local planning.

6.3.4 Approach to Analysis

Based on the CEQA and NEPA discussions above, assessing the growth-inducement potential of the MPWSP involves answering the question: Would implementation of the proposed project directly or indirectly cause economic or population growth or residential construction? As indicated above, a project can have a direct or indirect growth inducement potential, or both. This chapter addresses the proposed project's indirect effects; the potential direct effects are addressed in Section 4.19, Population and Housing.

To determine the MPWSP's potential to indirectly induce growth, the proposed project was evaluated for its potential to stimulate additional housing development and the need for services as a result of increasing available water supply and providing associated infrastructure improvements. The following steps were taken to investigate the MPWSP’s growth inducement potential and to characterize the secondary effects on the environment resulting from such growth.

- **Describe the Relationship Between Land Use Planning and Water Supply.** Section 6.3.2 provides an overview of water supply and land use planning requirements in

[18] The CEQA Guidelines define indirect effects the same as NEPA, above, except that the Guidelines refer to “indirect or secondary” effects (Section 15358(a)(2)).

California to provide the reader with an understanding of the rules that govern decisions about water, land use, and growth.

- **Identify Changes in Water Supply and Characterize Growth-Inducement Potential of the Proposed Project.** Section 6.3.5 analyzes the impact of growth-inducement. It describes the water supply that the MPWSP would provide, and characterizes the proposed project's potential to support or foster growth within the service area. The section describes recent growth trends reflected in census data; presents population and housing forecasts prepared by AMBAG; and provides an overview of growth anticipated in the general plans of the jurisdictions served by the MPWSP. To evaluate the proposed project's consistency with growth anticipated by these local planning agencies, the analysis compares project supply that would be available to meet future demand with an analysis of future water needs prepared by the MPWMD in collaboration with service area jurisdictions.

  While Castroville is not in CalAm's service area, the analysis also considers the growth-inducement potential of delivering Salinas Valley Groundwater Basin return water as desalinated supply, to the Castroville Community Services District (see Section 6.3.5.4).

- **Characterize the Indirect or Secondary Effects of Planned Growth.** When the jurisdictions adopt general or specific plans, they must first perform CEQA review. Those CEQA documents have evaluated the environmental effects of planned growth. To characterize and disclose the impacts of planned growth, including the cumulative impacts of such growth, the EIRs prepared for the general plans of jurisdictions served by the proposed project are summarized in Section 6.3.6.

6.3.5 Growth-Inducement Potential

6.3.5.1 Proposed MPWSP Water Service Capacity

As described in Chapter 2, Water Demand, Supplies, and Water Rights, CalAm proposes that the MPWSP provide, along with other supply sources, sufficient water supply to:

- meet existing service area demand;
- serve development that uses existing water entitlements held in the Pebble Beach-Del Monte Forest area;
- develop vacant legal lots of record; and
- support increased water consumption at local restaurants and lodging when tourism increases under improved economic conditions.

Table 6.3-1 summarizes the water demand CalAm proposes to meet with the MPWSP, along with existing and other planned water supply sources. Of the total annual demand of 14,275 af, the estimate of existing annual system demand, 12,270 afy, is based on demand in 2010.[19] CalAm's existing demand also includes 325 afy associated with existing Pebble Beach water entitlements, as discussed below. Other demand proposed to be served by the MPWSP totals 1,680 acre-feet per year (afy). The proposed water supplies for each of these demand components are analyzed below to determine whether they would have growth-inducement effects.

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[19] Although demand in 2010 is slightly less than the current 10-year average demand (12,351 afy) CalAm assumes this is the appropriate level of demand for planning purposes to ensure the proposed action is sized appropriately to meet peak demands as required by state regulations; see Section 2.3 in Chapter 2 for more information.

TABLE 6.3-1
MPWSP DEMAND ASSUMPTIONS

Demand Component	Annual Demand (acre-feet)
Existing Annual System Demand	12,270
Pebble Beach Water Entitlements	325
Hospitality Industry Rebound Economic Recovery	500
Legal Lots of Record	1,180
Total	**14,275**

SOURCE: RBF Consulting, 2013; Svindland, 2016.

Components of Water Demand to be Served by the MPWSP

Existing System Demand

Annual demand

CalAm's estimate of existing system annual demand is based on recent demand data for the areas of CalAm's Monterey District that would be served by the project: the main distribution system and the Ryan Ranch, Hidden Hills, and Bishop satellite systems, and is presented in Section 2.3.1.1. As discussed above in Section 6.3.3, a proposed project would induce growth if it would directly or indirectly foster economic or population growth, including by removing an obstacle to growth (such as a constraint on water supply) in the surrounding environment. The portion of MPWSP water used to satisfy existing annual demand would replace current withdrawals from the Carmel River and Seaside Groundwater Basin in excess of CalAm's legal rights. The portion of MPWSP supply used to meet average and peak demands of existing customers (see Section 2.3.1.2) would not be available to serve economic or population growth. Therefore, this portion of the MPWSP supply would not be growth-inducing under CEQA and NEPA because it would not remove water supply limitations as an obstacle to additional growth.

Pebble Beach Entitlements

As described in Chapter 2, Water Demand, Supplies and Water Rights, Section 2.3.1.3, the MPWMD granted water entitlements totaling 380 afy to the fiscal sponsors that underwrote development of the Carmel Area Wastewater District/Pebble Beach Community Services District (CAWD/PBCSD) wastewater reclamation project. The reclamation project now provides all of the irrigation water used on golf courses and some open space areas in the Del Monte Forest, and MPWMD estimates that it saves approximately 1,000 afy of potable water (Stoldt, 2011). In 2013, when CalAm prepared the estimate of demand associated with these entitlements, approximately 325 afy of the entitlements were unassigned. Since then, MPWMD has issued additional water permits and the remaining unassigned Pebble Beach entitlements now stand at about 304 afy (MPWMD, 2016a). Because the recently issued permits may not immediately translate to water connections or water use that is reflected in existing demand data, 325 afy is a reasonable estimate of demand associated with these entitlements.

The remaining entitlements represent an existing commitment by MPWMD to issue water permits to entitlement-holders and, as stated by the SWRCB in the CDO (SWRCB, 2016), the total entitlements represent less water than historically had been diverted from the Carmel River to serve areas now served by the wastewater project. Given that the Pebble Beach entitlements represent an existing commitment by MPWMD and duty to serve by CalAm whether or not the MPWSP is implemented, water supply limitations are not considered an obstacle to the development of the Del Monte Forest properties associated with these entitlements. Therefore, the Pebble Beach water entitlements are considered part of CalAm's existing demand and project water supply used to serve these entitlements would not be growth-inducing under CEQA or NEPA.

Other Service Area Demand

Hospitality Industry Rebound

Since the 2008 recession, the Monterey Peninsula hospitality industry, which includes hotels, restaurants and other visitor-serving businesses, has experienced lower occupancy rates – and therefore lower water use – than it had before the recession (Svindland, 2013). With the recession over, the industry expects to rebound. Industry representatives are concerned that basing the estimate of existing demand on water use in recent years will understate water needs at existing businesses during a more robust economy. CalAm estimates that a tourism rebound will increase annual demand by about 500 afy and the rebound will be evenly distributed between May and September, which is the high tourist season (RBF Consulting, 2013). CalAm based this estimate on its review of past water use by commercial sector customers (Svindland, 2013) and "recent discussions in the region" (RBF Consulting, 2013). As described in Chapter 2, Water Demand, Supplies, and Water Rights, Section 2.3.3, the MPWMD performed several comparisons of recent commercial sector water demand with earlier levels of demand, considering the years 1998 through 2011, and determined that recent demand was 194,236, or 440 afy lower than in previous years, depending on the years compared and the methodology used (refer to Chapter 2, Section 2.3.2.1 for more information).

This analysis performed several additional comparisons of commercial sector water consumption, based on annual CalAm consumption reports that the MPWMD provided for water years[20] 2003 through 2015 (MPWMD, 2008, 2013a, 2016b). **Table 6.3-2** summarizes commercial sector consumption data from these reports; the data reflect consumption in CalAm's Monterey District main distribution system and the Ryan Ranch, Hidden Hills and Bishop satellite systems. As the table shows, over this 13-year period, annual commercial sector consumption declined in all but two years; therefore, comparing the earliest years in the period with the most recent years yields the most pronounced differences. For example, consumption in 2003 was 980 af higher than in 2015. Average annual consumption for the four years before the recession (water years 2004 through 2007) was 233 af higher than average annual consumption for the four years after the recession started (2008 through 2011) and average annual consumption for the five years before the recession (water years 2003 through 2007) was 289 af higher than for the average of the five years after it started (2008 through 2012). Considering all 13 years shown, average annual consumption for the five years prior to the recession was 434 af higher than average annual

[20] A water year runs from October 1 through September 30 and is named for the year in which it ends.

consumption for the eight years since (water years 2008 through 2015), which included four drought years. Consumption in the last year before the recession (water year 2007) was higher than the year before and any year since. Since the region was experiencing a serious drought during the last four years of the 13-year record shown in Table 6.3-2, at least some of the reductions in demand shown in these years may reflect short term behavioral water conservation practices that may not be sustained during normal rainfall years.

TABLE 6.3-2
MONTEREY DISTRICT COMMERCIAL SECTOR WATER CONSUMPTION
WATER YEARS[a] 2003 THROUGH 2015

2003-2009		2010-2015	
Water Year[a]	**Consumption (acre-feet)[b]**	**Water Year[a]**	**Consumption (acre-feet)[b]**
2003	3,284	2010	2,857
2004	3,320	2011	2,839
2005	3,108	2012	2,770
2006	3,093	2013	2,731
2007	3,125	2014	2,498
2008	3,097	2015	2,304
2009	2,920		
Annual Average 2003-2009	3,135	Annual Average 2010-2015	2,667

NOTES:
[a] A water year runs from October 1 through September 30 and is named for the year in which it ends.
[b] Consumption shown is for the CalAm's Monterey County District excluding the Ambler, Ralph Lane, Chualar, and Toro satellite systems, which would not be served by the proposed project.

SOURCE: MPWMD, 2008; 2013a, 2016b.

MPWMD's water conservation programs have continued over this period, and have permanently reduced some consumption through, for example, the replacement of less efficient water fixtures with more efficient ones or the replacement of more water-intensive landscaping with drought-tolerant landscaping. Thus, the years just prior to the recession should better indicate the increases in commercial sector demand that could result from economic recovery and a rebound of tourism in the area than do the earlier years. MPWMD's analysis of occupancy levels and commercial sector water consumption indicated that, based on four hospitality-industry businesses in Monterey and one in downtown Carmel, occupancy levels in 2011 were about 7 percent lower than the average occupancy levels for the years 1998 to 2001. Based on this difference, and on commercial sector water consumption data, MPWMD calculated that a 7 percent increase in the average annual commercial water demand for years 2009 to 2011 would increase annual demand by about 194 af. The greatest difference MPWMD found in its analysis, which compared average commercial water use for water years 2009 through 2011 with water use in the year 2000, was 440 afy; commercial water use was 3,207 af in the year 2000, which is higher than most years shown in Table 6.3-2. Of the comparisons presented above, the greatest differences are in the comparisons that include more distant pre-recession years or include post-recession years influenced by the recent drought.

Given the permanent reductions in water consumption achieved by the ongoing conservation programs and the fact that the recent severe drought was not a factor constraining water use in the year CalAm used to represent existing annual water demand, the less extreme pre-and post-recession differences found in the above comparisons seem more likely indicators of the increased commercial sector water use that could occur in a fully recovered post-drought economy than do the more extreme differences. Therefore, based on the above considerations, increases in demand at area restaurants, lodging, and other commercial businesses from a rebounding economy may more likely be on the order of 200 or 300 afy, rather than CalAm's estimate of 500 afy.

A recent study of the economic impacts of travel in California suggests that the tourism in Monterey County may have largely returned to pre-2008 levels (Dean Runyon Associates, Inc., 2016). For example, by 2013, the California transient occupancy tax, which had decreased in the years following 2008, had surpassed 2007 levels for all but one of the Peninsula cities listed. By 2014, all of the listed Peninsula cities showed higher occupancy tax receipts than in 2008. While the increases in tax receipts reflect any increases in hotel room rates that have occurred over this period, it is assumed that the increase in occupancy tax receipts also reflect increased occupancy rates since 2008. Thus, it seems that Monterey County's hospitality industry has experienced a substantial rebound. However, because the last four years were also drought years, the water demand shown in Table 6.3-2 may be somewhat lower than what could be expected during normal rainfall years. Therefore, demand associated with hospitality industry rebound on the order of 200 to 300 afy remains a reasonable estimate for purposes of this analysis.

This rebound in demand is assumed to occur due to increased occupancy rates without any expansion in physical capacity. Because no development or expansion of physical capacity would cause those demand increases, water supply provided to meet such increases would not be considered growth-inducing under CEQA or NEPA.

To the extent that businesses were to expand, or to the extent that increased tourism in the area were to cause new businesses to open, that new development would only be possible if water supply were available. Water supply serving new or expanded businesses would remove water supply limitations as a constraint to such development and therefore would induce growth. Based on the analysis above, a portion of 500 afy capacity proposed to meet demand for the existing hospitality industry may exceed the need for this purpose. This analysis assumes that the excess water service capacity provided by the project would be available to support future growth; that would therefore be considered growth-inducing. According to the analysis above, even with economic recovery, between 200 and 300 afy of the project capacity earmarked for hospitality industry rebound may be available to serve additional growth in the service area. For simplicity's sake, this analysis assumes that about 250 afy of supply designated for rebound of the hospitality industry would likely be used for this purpose and 250 afy would be available for new development. How this surplus could be allocated is discussed below under "Assumptions Regarding Allocation and Use of MPWSP Water Service Capacity."

Vacant Legal Lots of Record

The proposed project would provide 1,181 afy of water to serve the development of vacant legal lots of record in the service area. This estimate is apparently based on an estimate presented in

CalAm's 2006 UWMP, which cited a 2001 MPWMD estimate of demand associated with vacant buildable lots of record (CalAm, 2006).[21] However, as described in Chapter 2, Water Demand, Supplies, and Water Rights, Section 2.3.2.2, the MPWMD no longer considers this a valid estimate. The most recent demand assessment prepared for MPWMD specifically on lots of record was a 2002 estimate that identified demand of 1,211 afy for lots of record in the incorporated cities of the service area. The District never adopted this estimate because it did not include demand associated with vacant lots on improved parcels in the unincorporated County areas (Stoldt, 2013). While MPWMD testified in 2013 that CalAm's estimate of 1,181 afy may therefore underestimate demand associated with lots of record (Stoldt, 2013), in 2017 MPWMD observed that development has occurred since those estimates were prepared in the early 2000s and that some vacant lots on improved parcels that were included in MPWMD's vacant lot study may never be split from the main property and developed (MPWMD, 2017). MPWMD's most recent estimate of future service area demand, prepared in collaboration with service area jurisdictions, was completed in 2006. In that estimate, the MPWMD did not evaluate demand associated with lots of record *per se*, although it included demand associated with new residential and non-residential development under general plan buildout, which would include developable lots within the respective jurisdictions. Water supply that would serve currently vacant lots of record would remove water supply limitations as an obstacle to the development of these lots and would induce growth under CEQA and NEPA. As discussed below in Section 6.3.5.3, this would not be growth beyond the level anticipated in adopted General Plans.

According to the MPWMD's methodology for calculating demand, and according to its water permit system, new demand can also be generated at developed lots of record by, for example, adding bathrooms and fixtures. For this analysis, absent the addition of new dwelling units or similar intensification of use at a given lot, supply that would meet demand associated with remodels or fixture additions at developed lots would not be considered to be removing an obstacle to new development and therefore would not be growth-inducing. In any event, because this analysis assumes that MPWSP would provide 1,181 afy that could support new development at currently vacant lots of record, this component of demand would be growth-inducing.

Assumptions Regarding Allocation and Use of MPWSP Water Service Capacity

As noted in Section 2.5.4 and above in Section 6.3.2.3, MPWMD is responsible for allocating water to the jurisdictions within its boundary. MPWMD has not prepared an allocation program for the water that the MPWSP would provide. MPWMD will start updating its water allocation program's EIR once construction has started on an identified water supply project (MPWMD, 2015). Separate from CalAm's current MPWSP application, MPWMD plans to collaborate with CalAm and the service area jurisdictions to address the allocation of water from the MPWSP. In the meantime, absent a new allocation for the MPWSP water, this analysis assumes that the MPWMD's allocation of water provided by the project would be similar to the District's current and past allocation programs. That is, for purposes of this EIR/EIS, it is assumed that supply provided by the proposed project would be used to meet existing demand within the CalAm

[21] The 2006 UWMP refers to a 2001analysis by the MPWMD that "projected an additional California American Water demand of 1,181 afy, based on a review of vacant legal buildable lots of record" (CalAm, 2006). Note that this is not CalAm's currently adopted UWMP; CalAm's current UWMP (WSC, 2012) does not include an estimate of demand associated with vacant lots of record.

service area, and that water service capacity beyond that would be allocated to the jurisdictions in general proportion to an estimate – which the MPWMD has not yet developed – of their future water supply needs. Once the water is allocated to the jurisdictions, each city and the County (for the unincorporated areas) would have the responsibility and discretion to approve or deny proposed development projects for which water was available, consistent with the jurisdiction's role as the primary land use authority (discussed in Section 6.3.2 above) and applicable land use plans, policies, regulations and laws. For example, this analysis recognizes that supply based on an estimate of demand associated with lots of record may not exclusively serve development of existing vacant lots; some portion of it could, for example, support development of lots created after the preparation of this EIR/EIS or the approval of this project, depending on the jurisdiction's internal allocation system and assuming water service capacity were available.

Similarly, because at present there is no guarantee that the 500 afy proposed to meet demand associated with hospitality industry rebound would be reserved for that use, this analysis assumes that either the MPWMD or the local jurisdictions could elect not to set aside 500 afy exclusively for use by existing businesses. Therefore, some portion of this 500 afy could actually serve new development within the service area.

As discussed in Section 2.5.4, MPWMD recently confirmed that the future allocation process has not yet been defined; refer to Section 2.5.4 regarding options MPWMD would consider regarding the allocation or reservation of MPWSP water, once the MPWSP was approved and it is clear that the project would be constructed. These considerations do not change the allocation assumptions described above for this analysis.

Conclusion: MPWSP Water Service Capacity

Along with existing and other planned water supply sources, the MPWSP would provide up to 16,294 afy during the 25-year Seaside Groundwater Basin replenishment period; an additional 700 afy of Seaside Groundwater Basin supply would be available to the CalAm service area at the end of the replenishment period.[22] Of this, 12,845 afy would serve existing service area demand and water entitlements, and another 1,680 afy is proposed to meet anticipated future demand. This includes an estimated 250 afy associated with the local hospitality industry, absent new development, assuming increased economic activity. Thus, 12,845 afy would be used to meet existing demand, water entitlements, and demand of existing business customers, and 1,430 afy would support additional development. **Table 6.3-3** provides a breakdown of demand associated with existing and anticipated land uses assumed for the MPWSP. **Table 6.3-4** shows water supplies that would be available with the MPWSP, compared with the service area demands shown in Table 6.3-3, as well as two estimates of the SVGB return water obligation associated with operating the proposed 9.6-mgd desalination plant. As discussed in Chapter 2, the SVGB return water obligation will be based on the amount of fresh water component in the source water. In order to consider the effect of the return water for this EIR/EIS, groundwater modeling

[22] For the first 25 years of MPWSP operation, CalAm would provide in-lieu replenishment of the Seaside Groundwater Basin in repayment of groundwater CalAm has pumped from the basin in excess of CalAm's adjudicated right, as discussed in Chapter 2, Section 2.2.4. Replenishment would occur at a rate of 700 afy. During the replenishment period, available supply from the Seaside Groundwater Basin would be limited to 774 afy; at the end of the replenishment period, available supply would equal CalAm's adjudicated right of 1,474 afy.

simulated scenarios with return water obligations representing 0, 3, 6, and 12 percent of the source water (see Section 4.4, Groundwater Resources).

TABLE 6.3-3
EXISTING AND ANTICIPATED DEMAND
(acre-feet per year)

Demand Component	MPWSP Demand Assumptions	Demand Associated with Existing Land Uses and Water Entitlements	Demand Associated with Anticipated Development
Existing Annual System Demand	12,270	12,270	-
Pebble Beach Water Entitlements	325	325	-
Hospitality Industry Bounce-Back	500	250[a]	250
Legal Lots of Record	1,180		1,180
Total	**14,275**	**12,845**	**1,430**

NOTES:
[a] A comparison of commercial sector demand prepared for this analysis suggests that demand by the hospitality industry under improved economic conditions may be lower than identified by CalAm; refer to text discussion for more information.

SOURCE: Table 6.3-1.

TABLE 6.3-4
WATER SUPPLIES AND DEMANDS DURING SEASIDE GROUNDWATER BASIN REPLENISHMENT PERIOD, 9.6-MGD DESALINATION PLANT WITH SVGB RETURN
(acre-feet per year)

	Existing Demand[a]		Existing and Anticipated Demand	
Supplies and Demands	**6% SVGB Return**	**12% SVGB Return**	**6% SVGB Return**	**12% SVGB Return**
Total Supplies[b]	**16,294**	**16,294**	**16,294**	**16,294**
Service Area Demand (Existing and Anticipated)	12,845	12,845	14,275	14,275
Supply Available for Other Use (Total Supplies Minus Service Area Demand)	3,449	3,449	2,019	2,019
SVGB Return (6% and 12%)	1,620	3,240	1,620	3,240
Surplus or (Deficit)	**1,829**	**209**	**399**	**(1,220)**

NOTES: mgd = million gallons per day; Seaside GW Basin = Seaside Groundwater Basin; SVGB = Salinas Valley Groundwater Basin
[a] Includes 325 afy for Pebble Beach water entitlements.
[b] Water supply sources include: Carmel River (3,376 afy), Seaside Groundwater Basin (774 afy), Aquifer Storage and Recovery Project (1,300 afy), Sand City Coastal Desalination Plant (94 afy), and the proposed MPWSP Desalination Plant (10,750 afy), as shown in Table 2-4 of Chapter 2.

SOURCE: Table 2-4, Table 6.3-3.

Table 6.3-4 illustrates available and surplus supply (or deficit) during the Seaside Groundwater Basin replenishment period, assuming a 6 percent or 12 percent return water obligation. As shown, under either of these return water scenarios, the available supply would meet existing service area demand and water entitlements and demand associated with the existing hospitality industry (12,845 afy), with a surplus of 209 or 1,8292 afy depending on the return water obligation. The table also compares available supply with the total 14,275 afy demand that the MPWSP is proposed to meet. Assuming a 6 percent SVGB return water obligation, there would be enough water to meet existing and anticipated demand. But assuming a 12 percent return water obligation, supplies would not be able to fully meet anticipated demand. Total projected demand associated with development of the Pebble Beach entitlements and lots of record would not occur immediately, however; rather, it is expected to occur gradually over time. At the end of the Seaside Groundwater Basin replenishment period an additional 700 afy of Seaside Groundwater Basin supply would be available to the CalAm service area.

Supply not used to meet existing demand, water entitlements, demand of existing business customers under more robust economic conditions, or the SVGB return water obligation would be available to support new development. New development might include development of existing vacant lots of record. Water supply capacity to serve new development would remove water supply limitations as an obstacle to such development and would be considered growth-inducing under CEQA and NEPA.

6.3.5.2 MPWSP Infrastructure Capacity

Pipeline Capacity

CalAm sized the proposed project pipelines to accommodate a range of flow volumes, including flows associated with the proposed 9.6-mgd MPWSP desalination plant, or with a 6.4-mgd desalination plant – the size of the plant that would be built if CalAm were able to purchase water from the Pure Water Monterey Groundwater Replenishment (GWR) project. The 6.4-mgd desalination plant is evaluated in Chapter 5, Alternatives, and described in Sections 5.4.7 and 5.4.8. Consistent with standard engineering practice, pipeline sizing takes into account the need to meet peak demands, since water demand fluctuates daily, monthly and seasonally over the course of a year. Refer to Chapter 2, Water Demand, Supplies, and Water Rights, Section 2.3.2, for more information regarding consideration of peak demands. **Table 6.3-5** shows the flow capacity of the proposed service area pipeline segments and the flows that would be generated by the 6.4- and 9.6-mgd plants. The table also shows that all pipelines would have the capacity to accommodate flows generated by a somewhat larger-capacity plant.

Added pumping pressure enables pipelines of a given size to accommodate the higher flows. For example, in the normal course of business, the estimated operating pressure needed to pump flows from a 9.6-mgd plant would be 132 pounds per square inch (psi) at the plant. The plant itself would comprise seven modules – six in operation plus one on standby – each of which independently produces 1.6 mgd. While CalAm does not propose to regularly run all seven modules, it might have to do so in an emergency (Svindland 2014). Running all seven modules would produce a total of 11.2 mgd: 9.6 plus 1.6. To pump that additional 1.6 mgd would require an operating pressure of 136 psi.

TABLE 6.3-5
RANGE OF FLOW VOLUMES ACCOMMODATED BY PIPELINE SEGMENT

Pipeline Segment	Pipeline Capacity (Flow Volumes Accommodated) (mgd)	Flow per Pipeline Segment for 6.4-mgd Plant[a] (mgd)	Flow per Pipeline Segment for 9.6-mgd Plant[b] (mgd)	Flow per Pipeline Segment for 11.2-mgd Plant[c] (mgd)	Flow per Pipeline Segment for 12.8-mgd Plant[d] (mgd)
Source Water Pipeline	16-30	16	24	28	30
Brine Discharge Pipeline	12-20	10	14	17	18
Salinas Valley Return Pipeline	2-4	2	3	3	4
Desalinated Water Pipeline	6-13	6	10	11	13
Transmission Main	6-13	6	10	11	13
ASR Pipeline	15	15	15	15	15

NOTES:
[a] Flow that would be generated by four 1.6-mgd reverse osmosis modules; i.e., operation of the 6.4-mgd plant not including its 1.6-mgd standby module.
[b] Flow that would be generated by six 1.6-mgd reverse osmosis modules; i.e., operation of the 9.6-mgd plant not including its 1.6-mgd standby module.
[c] Flow that would be generated by seven 1.6-mgd reverse osmosis modules; i.e., concurrent operation of all six modules of a 9.6-mgd plant and its 1.6-mgd standby module.
[d] Flow that would be generated by eight 1.6-mgd reverse-osmosis modules. While this size plant is not proposed, this column shows that all pipeline segments would have capacity, with increased pumping pressure, to accommodate flows from a 12.8-mgd plant.

SOURCE: Svindland, 2014.

The smaller 6.4-mgd plant that would be built in conjunction with purchase of GWR water would have four working modules plus one on standby; each, again, would produce 1.6 mgd. To pump flows under normal conditions, the smaller plant would require an operating pressure of 128 psi at the plant, and an additional 2 psi to pump the 8.0 mgd produced by all five units.

CalAm's initial basis for pipeline sizing assumed seven 1.6-mgd modules operating concurrently for the 9.6-mgd plant, and five 1.6-mgd modules operating concurrently for the 6.4-mgd plant. As **Table 6.3-5** shows, all of the pipeline segments would have the capacity to accommodate flows associated with a 12.8 mgd plant, which is somewhat higher than flows that would be generated by a 9.6-mgd plant plus its standby module. CalAm has noted that the lower end of the range of flows would have lower overall energy requirements (e.g., if the smaller plant were constructed) and that the pipelines' capacity to accommodate the higher end of the flows would delay the possible need for future, disruptive, pipeline expansion projects (Svindland, 2014).

Sizing the pipelines to accommodate flows beyond that needed to serve the proposed project would remove constrained pipeline capacity as an obstacle to future growth and therefore would induce growth. Additional water supply would be required to generate the higher future flows that the MPWSP pipelines could accommodate. Expanding the desalination plant to increase its production capacity beyond 9.6 mgd would require additional CEQA review and approval by the CPUC and, if more source wells were needed, NEPA review and approval by the MBNMS. In addition, before CalAm could increase production capacity, the MPWMD would need to review the proposed increase under CEQA and issue a permit under its Rule 22; CalAm would likely require other permits as well.

According to a proposed Settlement Agreement between CalAm and other parties relating to CalAm's MPWSP application, MPWMD intends to collaborate with the Monterey Peninsula Regional Water Authority, Monterey County, and CalAm to determine an accurate estimate of the added water supply capacity needed to meet the General Plan buildout projections for communities served by CalAm (CalAm et al., 2013). That process has not yet begun, however, and we cannot predict its results. Depending on the results, the proposed pipelines would accommodate some or all of the added water supply needs identified in this process. Growth anticipated in jurisdictions' General Plans is summarized below in Section 6.3.5.3 and the effects of growth under General Plan buildout that would be induced by pipeline capacity, and the added water supply the pipelines could accommodate, are evaluated in Section 6.3.6.

Permitted Desalination Plant Capacity

If CalAm does purchase water from the GWR project, it could reduce the size of its MPWSP Desalination Plant. Because the GWR project's timing and cost were uncertain when CalAm submitted its application for the MPWSP, CalAm proposes a 9.6-mgd desalination plant (proposed project), but also seeks authorization to reduce the size of the desalination plant to 6.4 mgd (Alternative 5a) and purchase water from the MRWPCA and MPWMD. The MRWPCA certified the Final EIR for the GWR project and approved the project in October 2015 and adopted an Addendum in October 2017. The CPUC authorized CalAm's entry into a water purchase agreement in September 2016. However, while the CPUC has authorized CalAm's entry into a water purchase agreement, given the possibility that the GWR project could run into financing or permitting obstructions, CalAm continues to seek approval of the 9.6-mgd desalination plant in the event that the GWR project is not developed. CalAm is not proposing a 9.6-mgd desalination plant plus the GWR water purchase and this analysis does not consider the growth inducement potential of such a combination. Refer to Chapter 5, Alternatives, for more information about the 6.4-mgd desalination plant (Alternatives 5a and 5b) and to Chapter 4, Section 4.1, Overview, for more information on the GWR project and how it is considered in this EIR/EIS.

6.3.5.3 Growth Trends and Planning Agency Projections

In evaluating the potential environmental effects of growth, a key consideration is whether the growth induced or supported by a project would be planned growth – i.e., growth that is anticipated in the adopted planning documents of the jurisdictions served by that project. This section presents census data indicating recent growth trends in service area jurisdictions, the projections of future growth prepared by the regional planning agency, and growth trends and planned development anticipated in the general plans of service area jurisdictions, and compares water supply that would be provided by the MPWSP and potentially available to serve future development with estimates of water supply needed for general plan buildout.

Service Area Growth Trends 1990-2010

Table 6.3-6 shows population and housing data from the U.S. census for the years 1990, 2000, and 2010. Except for Sand City, population in all of the cities in the service area declined between 1990 and 2000; population in the service area cities as a whole decreased by about 9 percent. The decrease in population slowed between 2000 and 2010, decreasing by 3 percent for the cities as a whole. Sand City's population increased in both decades, by 36 percent (69 new residents)

TABLE 6.3-6
SERVICE AREA AND MONTEREY COUNTY GROWTH TRENDS 1990-2010
POPULATION AND HOUSING

	Population							Housing Units						
Jurisdiction	**1990 Census**	**2000 Census**	**2010 Census**	**Change 1990-2000**	**Percent Change 1990-2000**	**Change 2000-2010**	**Percent Change 2000-2010**	**1990 Census**	**2000 Census**	**2010 Census**	**Change 1990-2000**	**Percent Change 1990-2000**	**Change 2000-2010**	**Percent Change 2000-2010**
Carmel-by-the-Sea	4,241	4,081	3,722	-160	-3.8%	-359	-8.8%	3,325	3,334	3,417	9	0.3%	83	2.5%
Del Rey Oaks	1,661	1,650	1,624	-11	-0.7%	-26	-1.6%	733	727	741	-6	-0.8%	14	1.9%
Monterey (city)	31,954	29,696	27,810	-2,258	-7.1%	-1,886	-6.4%	13,497	13,383	13,584	-114	-0.8%	201	1.5%
Pacific Grove	16,117	15,522	15,041	-595	-3.7%	-481	-3.1%	7,916	8,032	8,169	116	1.5%	137	1.7%
Sand City	192	261	334	69	35.9%	73	28.0%	86	87	145	1	1.2%	58	66.7%
Seaside	38,826	33,097	33,025	-5,729	-14.8%	-72	-0.2%	11,214	11,005	10,872	-209	-1.9%	-133	-1.2%
Subtotal: Cities	***92,991***	***84,307***	***81,556***	***-8,684***	**-9.3%**	***-2,751***	**-3.3%**	***36,771***	***36,568***	***36,928***	***-203***	**-0.6%**	***360***	**1.0%**
Unincorporated Monterey County[a]	100,461	101,414	100,213	953	0.9%	-1,201	-1.2%	34,342	37,139	38,296	2,797	8.1%	1,157	3.1%
Monterey County (Total)	355,660	401,762	415,057	46,102	13.0%	13,295	3.3%	121,224	131,708	137,910	10,484	8.6%	6,202	4.7%

NOTES:
[a] Data are for the entire unincorporated county.

SOURCE: California Department of Finance, 2007; 2013.

between 1990 and 2000 and 28 percent (73 new residents) between 2000 and 2010. The total number of housing units in service area cities decreased by 0.6 percent between 1990 and 2000 and increased by 1 percent between 2000 and 2010. Information shown for the unincorporated county is for the entire county, not just the part in CalAm's service area. Population in unincorporated Monterey County stayed about the same over these two decades, increasing by about 1 percent between 1990 and 2000 and decreasing by about 1 percent between 2000 and 2010, while the number of housing units increased.

AMBAG Projections

In 2014, AMBAG adopted its current forecast of population, housing and employment, and its Metropolitan Transportation Plan/Sustainable Communities Strategy for the region. **Table 6.3-7** shows the growth forecast to the year 2035 for the cities in the CalAm service area and unincorporated Monterey County. Unlike AMBAG's previous forecast, which it adopted in 2008, the current forecast takes into account the 2010 census, the Sustainable Communities Strategy requirements of SB 375, and the effects of the economic downturn that occurred between 2008 and 2012. Development of the forecasts involved substantial input and feedback from the jurisdictions in the AMBAG region (AMBAG, 2014a). Although population, housing, and jobs in the service area cities and in unincorporated Monterey County were lower in 2010 than had been projected in AMBAG's 2008 forecast, AMBAG now projects faster population and housing growth rates in the service area cities over the 2010-2035 planning period compared to the previous forecast. As **Table 6.3-7** shows, the population of each service area city is projected to increase over the 2010-2035 projection period, although Carmel is projected to lose population between 2010 and 2020 before beginning to grow again. In terms of percentage increase, Sand City is projected to grow the fastest although, because of its small size, its net population increase over the 25-year projection period is smaller than that of several other service area cities. Seaside is projected to have the largest net increase in population over the projection period. Overall, the population of service area cities is projected to increase by 21 percent between 2010 and 2035. Housing stock in the cities is projected to grow at a slower pace, increasing by 12 percent over the projection period. Employment in service area cities as a whole is projected to grow faster than population, with the number of jobs increasing by almost 30 percent by 2035. Projections shown in **Table 6.3-7** for unincorporated Monterey County are for the entire unincorporated area, much of which is outside CalAm's service area. Population in the unincorporated areas of the county is projected to grow by 4 percent over the projection period, while the number of housing units is projected to increase by 2 percent, and the number of jobs is projected to increase by 9 percent.

Growth Trends and Projections in Jurisdiction Land Use Planning Documents

As discussed above in Section 6.3.5.1, the MPWSP would provide more water than needed to meet existing demand and demand associated with existing businesses. In other words, there would be water to serve additional development – water for growth. The land use plans of the jurisdictions served by CalAm establish land use development patterns and growth policies that allow for the orderly expansion of urban development supported by adequate public services and infrastructure. A project that would induce growth that was inconsistent with those plans and policies could result in adverse environmental impacts not previously addressed in the CEQA review of those plans. Therefore, the general plans of jurisdictions that would be served by the MPWSP were reviewed.

TABLE 6.3-7
AMBAG POPULATION, HOUSING, AND EMPLOYMENT PROJECTIONS

Jurisdiction	2010	2020	2025	2030	2035	Percent Change 2010–2035
POPULATION						
Cities – CalAm Service Area						
Carmel	3,722	3,541	3,661	3,789	3,917	5%
Del Rey Oaks	1,624	1,889	2,345	2,806	3,468	114%
Monterey	27,810	28,004	28,839	29,743	30,647	10%
Pacific Grove	15,041	15,394	15,914	16,472	17,030	13%
Sand City	334	1,048	1,198	1,414	1,550	364%
Seaside	33,025	36,120	40,260	41,308	42,256	28%
Total - CalAm Cities	**81,556**	**85,996**	**92,271**	**94,533**	**98,868**	**21%**
Unincorporated County[a]	100,213	102,847	103,147	104,028	104,304	4%
Monterey County (Total)	415,057	447,516	463,884	479,487	495,086	19%
HOUSING UNITS	**2010**	**2020**	**2025**	**2030**	**2035**	
Cities – CalAm Service Area						
Carmel	3, 417	3,417	3,417	3,417	3,418	0%
Del Rey Oaks	741	898	1,035	1,246	1,521	105%
Monterey	13,584	13,665	13,695	13,750	14,001	3%
Pacific Grove	8,169	8,169	8,169	8,274	8,478	4%
Sand City	145	439	496	586	629	334%
Seaside	11,335	12,556	12,907	13,311	13,664	21%
Total - CalAm Cities	**37,391**	**39,144**	**39,719**	**40,584**	**41,711**	**12%**
Unincorporated County[a]	38,971	39,337	39,633	39,730	39,735	2%
Monterey County (Total)	139,048	147,106	150,260	154,585	157,992	14%
EMPLOYMENT (JOBS)						
Cities – CalAm Service Area						
Carmel	2,282	2,645	2,716	2,793	2,875	26%
Del Rey Oaks	414	640	602	592	573	38%
Monterey	26,934	31,249	32512	33,597	34,828	29%
Pacific Grove	8,792	10,161	10,499	10827	11,194	27%
Sand City	1,561	1,839	1,873	1,908	2,500	60%
Seaside	7,790	8,828	9,092	9,344	9,628	24%
Total - CalAm Cities	**47,773**	**55,362**	**57,294**	**59,061**	**61,597**	**29%**
Unincorporated County[a]	58,071	62,998	63,795	63,955	63,443	9%
Monterey County (Total)	182,000	205,977	211,218	216,486	222,137	22%

NOTES:
[a] Projections are for all unincorporated areas of Monterey County.

SOURCE: AMBAG, 2014a.

This section briefly summarizes expected growth in service area jurisdictions contained in the jurisdictions' general plans and related planning documents. The summaries include the jurisdictions' housing need allocation identified through the Regional Housing Need Allocation (RHNA) process, since that represents potential residential growth planned for in the jurisdictions' general plan housing elements. To the extent the general plans describe the jurisdiction's approach to allocating its water supply (from the allocation administered by MPWMD), that information is noted.[23] The summaries include estimates of current and projected population and housing to the extent this information is provided.

According to the general plans, except for the former Fort Ord lands that several cities have annexed,[24] most jurisdictions in the service area are largely built out, and infill development and intensification of land uses is a means of accommodating additional growth. All of the jurisdictions cite limited water supply as a key factor limiting planned development within their boundaries. Most of the general plans were adopted before the start of the 2008 economic recession and therefore do not reflect or anticipate its effects. The general plan housing elements were adopted more recently, between 2010 and 2016.

City of Carmel-by-the-Sea

- The City of Carmel-by-the-Sea adopted its General Plan, in 2003 and adopted its 2015-2023 Housing Element in December 2015 (City of Carmel, 2003, 2015a).
- Citing the U.S. Census and California Department of Finance, the Housing Element states that the city's population decreased by 11.6 percent between 1990 and 2015, and that there was a net increase of 83 housing units between 2000 and 2015.
- Noting that AMBAG's Regional Housing Need Allocation for 2014 to 2023 identified a housing need in Carmel of 31 additional housing units, the Housing Element identifies the capacity to accommodate a total of 164 additional residential units.
- The Housing Element identifies the lack of water as the primary infrastructure constraint to the development of housing in Carmel, and states that the lack of an available water supply continues to limit growth in Carmel and throughout the Monterey Peninsula region. The City allocates its share of Monterey Peninsula water supply based on policies in the General Plan's Land Use and Community Character and Housing Elements, which affirm the City's commitment to housing. Residential uses have high priority and the largest water allocation. Existing subdivided lots zoned for housing are first in line for limited water resources, except when this would preclude development of essential public services, recreational uses or facilities, or visitor-serving uses consistent with the Coastal Act. The City limits new subdivisions of land until existing subdivided lots have a secure water supply, and endorses the concept of distributing the limited water resources across many properties to prevent any single project from consuming a disproportionate share of available water, and to maximize the number of units that can be built or approved.
- According to the Housing Element, the City is close to expending its water allocation from MPWMD: the City has about 3.251 af of available water, of which about 1.67 af are in the

[23] CalAm has not proposed how the jurisdictions should allocate MPWSP water to serve vacant lots of record, for example, nor does the MPWMD dictate to the jurisdictions how they must manage the water allocated to them. To the extent the general plans included information on how the jurisdiction currently allocates its water supply, such information may provide insight on how the jurisdiction would allocate its MPWSP supply.

[24] The former Fort Ord lands are served by another water provider, Marina Coast Water District, not CalAm; therefore development planned for these lands is not a focus of this analysis.

City's reserves. The City supports efforts by the MPWMD and other agencies to expand the water supply, and it has a representative on both the MPWMD Technical Advisory Committee and the Policy Advisory Committee. Housing Element Program 3-5.6 b, Water Conservation, recognizes the need to conserve and manage the City's water resources to accommodate regional housing need. The City's Municipal Code includes specific requirements for water conservation in existing and new developments. New development projects and existing structures needing a building permit for substantial proposed construction must meet the City's water conservation requirements. The Housing Element noted that several projects were under discussion as options for providing a new water supply for the Monterey Peninsula in response to SWRCB Orders 95-10 and 2009-0060, and that a more immediate supply may be available to the city from the amendment of the Eastwood Trust water rights license. This supply is described in Chapter 2, Section 2.4.6.2, Malpaso Water Company, LLC.

City of Del Rey Oaks

- The City of Del Rey Oaks General Plan was adopted in 1997 and has a planning period of approximately 20 years (City of Del Rey Oaks, 1997a). A draft update of the Housing Element was prepared in August 2006 but not adopted. The California Department of Housing and Community Development indicates that the City has not submitted a housing element for the 2015-2023 planning period to the department for certification (California Department of Housing and Community Development, 2016).
- The General Plan estimates that the City had a population of 1,692 in 1996, and provided about 321 jobs in the City's commercial and institutional sectors. The 2010 census indicates the city had a population of 1,624 in 2010; AMBAG's 2014 forecast estimates that the city had 414 jobs in 2010.
- Buildout under the General Plan of the part of the city served by CalAm – that is, the area within the city limits before the former Fort Ord land was annexed – would result in five additional residential units, and the development of 43,500 gross square feet of retail/commercial land uses and a 205-room hotel. General Plan policies call for expanded and new revenue-generating businesses on visitor-serving and commercially zoned parcels in the City, development of commercial uses at the City's Highway 68/218 entrance, intensification of existing development, and the annexation of former Fort Ord land to provide additional sites for economic development.
- Buildout under the General Plan of the part of the city served by another water provider (i.e., the former Fort Ord land that was annexed to the city and is served by water provided via the Fort Ord Reuse Authority [FORA] and the Marina Coast Water District [MCWD]), includes development of a conference center, hotel, golf course, retail shops, a fitness center, office park, and corporate office center.
- AMBAG's Regional Housing Need Allocation for the 2014-2025 period states that Del Rey Oaks needs 27 additional housing units.[25]
- The General Plan indicates that the City had about 5.8 af of water for new land uses remaining in its allocation from MPWMD as of June 1995, but according to MPWMD's November 2013 monthly allocation report, Del Rey Oaks has no water remaining in its allocation (MPWMD, 2013b.)

[25] This housing need allocation is substantially lower than the 150 units identified for Del Rey Oaks in the previous regional housing need allocation. AMBAG's RHNA for 2007-2014 did not explain the relatively high number of units allocated to Del Rey Oaks for that period.

- The General Plan identifies water as a paramount concern for all of the jurisdictions on the Monterey Peninsula, and states that setbacks in providing additional supply, along with SWCRB's requirement that CalAm decrease withdrawals from the Carmel River, have magnified concern about the availability of water to support growth. General Plan policies call for the City to develop a water allocation program to prioritize water connections; work with the appropriate water management districts to encourage water conservation, retrofitting, education, reclamation, and reuse; consider water usage and conservation in all land use decisions; adopt and enforce a water conservation ordinance; and condition development plan approval on verification of available water service for projects.

City of Monterey

- The City of Monterey General Plan was adopted in 2005 and includes amendments through March 2016, including incorporation of the action program of the City's 2016 housing element. The City of Monterey Housing Element 2015-2023 was adopted March 16, 2016 (City of Monterey, 2016a, 2016b).

- The General Plan EIR (City of Monterey, 2004) projected that the city would have a population of about 34,660 residents at buildout, which is a 14 percent increase from the city's population in 2003 of about 30,350. As shown in **Table 6.3-7**, the 2010 census indicates that the City's population that year was 27,810; the California Department of Finance estimates that the City's population in 2015 was 28,576.

- The Housing Element states that the city is almost entirely built out and that future residential development is expected to occur through infill development – that is, through the recycling of existing sites and a limited amount of vacant land.

- AMBAG's Regional Housing Need Allocation for 2014-2023 states that Monterey needs 650 additional units. According to the City of Monterey 2015-2023 Housing Element, the City had issued permits or entitlements for 113 units since January 2015, so it needs 537 more. The Housing Element identifies a total capacity to develop 715 units based on an inventory of vacant and underutilized sites.

- The lack of available water is a primary obstacle to meeting General Plan goals; therefore, it is the goal of the City of Monterey and the General Plan to obtain a long-term, sustainable water supply. Among other things, the City is evaluating water supply options outside the present MPWMD framework (City of Monterey 2016a). The Housing Element states that all of the City's water allocation from the MPWMD has been allocated to projects. (City of Monterey, 2016b).

Presidio of Monterey

- The Presidio of Monterey is an active installation of the U.S. Department of the Army. While it is located within the Monterey city limits, the City does not govern it. Water used at the Presidio is part of MPWMD's overall allocation to the City. In 2013, the Army completed an EIS for the Presidio's Real Property Master Plan (U.S. Army, 2013a, 2013b), which replaces the 1983 Presidio of Monterey Master Plan.

- The Master Plan proposes short-range and long-range project building renovations or upgrades to be implemented over a 20-year planning horizon. The short-range project consists of Phase I of a multi-phase barracks complex project at the Presidio. The long-range projects include access control point upgrades, classroom renovations, and demolition and construction of three barracks complex projects and several instructional buildings. The EIS evaluated the environmental consequences of the short-range project at a project level of detail and the long-range projects were evaluated at a programmatic level. As the long-range projects move forward, they may need additional NEPA review.

- The Master Plan alternative selected for implementation locates most improvements within the Presidio, with some support facilities at the Ord Military Community site in the former Fort Ord military base. The EIS and Record of Decision for the EIS (U.S. Army, 2013a, 2013b) conclude that, over the Master Plan's 20-year planning horizon, the long-range projects would increase water demand at the Presidio by an estimated 34 afy. Water for the short-range project would be provided through the Presidio's existing permit. To meet demand for the long-range projects, the EIS identifies a total of 36.9 afy from water currently used at outdated barracks that are scheduled to be demolished as part of the long-range projects, and from water credits that the Presidio has from the MPWMD. While the EIS concludes that both action alternatives of the overall Master Plan development project would have a less than significant impact with respect to water supply, it notes that future developments concerning the Cease and Desist Order and the March 2011 moratorium on water service connections could affect water supply in the Monterey Region; the EIS therefore identifies mitigation measures to reduce future water demand. Measures include conserving more water, implementing best management practices at all new facilities, and installing rainwater collection systems and purple piping (in anticipation of the availability of future recycled water supply) in all new buildings. The EIS states that the Army could also consider additional measures to ensure long term water supply at the Presidio and Ord Military Community, like contracting with current water providers for additional water along with the development of future regional water supply projects.

City of Pacific Grove

- The City of Pacific Grove adopted its General Plan in 1994, and adopted its Housing Element 2015-2023 in March, 2016 (City of Pacific Grove, 1994, 2016).

- The Housing Element states that the city has experienced a small decline in population over the past 25 years, from 16,177 in 1990 to 15,388 in 2015. The size and composition of the city's housing stock changed very little over that period, with a net increase of about 270 units. The City is almost fully built-out, with very little vacant land available for new housing development. By the 1980s, the City had recognized that further growth would occur only as infill development on vacant lots and through the intensification of existing development.[26] The 1994 General Plan estimates that a maximum of 5,431 additional residential units could be built within the city limits. Most units would be accommodated through the intensification of existing development, including almost 3,500 secondary units attached to existing single family homes. Vacant lots could accommodate a total of 105 new single-family or multi-family units. Notwithstanding this estimate, the General Plan notes that in the 10 years preceding its publication, only 42 secondary units had been built, and that this actual rate of development suggested that, apart from water supply constraints, new secondary units would be added slowly and would not number in the thousands. Past trends suggested that the other identified residential capacity also would be developed slowly. The General Plan projected that commercially-zoned vacant parcels could accommodate an estimated 270,000 square feet of commercial development, and that more than 1 million square feet of commercial development could theoretically be added by intensifying existing uses.

- AMBAG's Regional Housing Need Allocation for 2014-2023 states that Pacific Grove needs 115 additional housing units. The City's 2016 Housing Element identifies a realistic

[26] The General Plan did not contemplate the City annexing any unincorporated land except for a three-acre parcel (the Mission Linen parcel) on unincorporated county land entirely surrounded by city lands.

potential for 148 new units to be built on vacant parcels and a total potential for 210 new units to be built on vacant and underutilized sites and sites with second unit potential.

- The Housing Element identifies the lack of available water as the greatest constraint on the production of new housing in Pacific Grove, stating that lack of water supply has resulted in very little new housing construction for over a decade. It is the City's policy to continue working aggressively with MPWMD and other Monterey Peninsula cities to find long-term solutions to the water problem, to increase the water available for residential uses, and to provide for drought protection. The City is working on projects to reduce the use of potable water where feasible, such as at the city's golf course and cemetery, consistent with Housing Element Program 3.1. In 1994, when it prepared the General Plan, the City had less than 8 af of its water allocation remaining. In 2008, the City had 5 af left, and the City Council distributed most of that 5 af, which enabled construction of more than 50 residential and non-residential projects. Most of the City's allocation has been distributed and the City has established a new water wait list. As of July 2015, 12 single family dwellings were on the wait list. The Housing Element states that without a new water allocation, the City will be unable to permit any new housing construction, except for the few properties that have sufficient onsite water credits for second units.

- The 2016 Housing Element notes that although additional water supply needed to meet demand associated with buildout of the 1994 General Plan was previously estimated to be 1,264 afy, this estimate was based in part on the maximum potential for second units and that long-term demand is now expected to be less. In testimony provided to the CPUC on the MPWSP, a City representative revised the future demand estimate the City had provided MPWMD in 2006, from 1,264 afy to 500 afy (as shown in **Table 2-5** of Chapter 2).

Sand City

- The Sand City General Plan: 2002-2017 was adopted in 2002 and the City of Sand City Housing Element Update 2009-2014 was adopted in 2010 (City of Sand City, 2002, 2010).

- Describing the city's historic growth rates, the General Plan states that the city's population reached 600 in the 1960s, but then declined as industrial and commercial land uses displaced housing. Between 1970 and 2000, the city's population fluctuated, ranging from a low of 182 in 1980 to a high of 261 in 2000. As shown in Table 6.3-5, the city continued to grow over the past decade, to a population of 334 in 2010.) Due to the city's commercial and industrial land uses, its daytime population of employees and shoppers increased to almost 10,000 (LAFCO of Monterey County, 2011).

- The 2002 General Plan projects a buildout population of 1,295, and points out that this city-generated estimate is lower than the population of approximately 1,800 that had been forecasted in AMBAG 's then-current 1997 forecast. AMBAG, in turn, had based its forecast in part on the city's 1984 General Plan. The 2010 Housing Element cites AMBAG's 2008 forecast projecting that the city's population would grow dramatically between 2010 and 2015 (from 447 to 1,498) and would not change further between 2015 and 2035. The Housing Element confirms that population growth beyond what AMBAG had projected for 2015 was unlikely due to the city's small size. As shown in Table 6.3-6, AMBAG's most recent forecast also projects substantial growth for the city, especially between 2010 and 2020, and now projects that the city will reach the earlier population estimate of about 1,500 residents between 2030 and 2035. The 2002 General Plan focuses on achieving a vision for the community that includes economic diversification; active redevelopment; enhanced community appearance and image; organized and well-planned growth; elimination of land use conflicts; and cohesive residential neighborhoods.

- AMBAG's Regional Housing Need Allocation for 2007-2014 identified a housing need in Sand City of 120 additional units.[27] According to the City's 2010 Housing Element, 31 units had been built between January 2007 and February 2009, and an inventory of vacant and underutilized sites identified the capacity to accommodate a total of 277 additional units on those sites. The City expects that 60 additional units will be produced by the end of 2014 (City of Sand City, 2010).

- The General Plan states that the critical shortage of water on the Monterey Peninsula limits the availability of water for new development, and that this condition is expected to continue until either a long-term source of water is developed for the region or until Sand City develops a desalination facility as its own water supply. As of 2001, Sand City had allocated essentially all of its available water to specific development parcels. Since the General Plan was prepared, Sand City completed construction of a 300 afy desalination plant, which is operated by CalAm. While water from the desalination plant is delivered to the CalAm system, Sand City is entitled to 206 afy to support its future development: MPWMD Ordinance 132, in consideration for the delivery of 300 afy of potable water from this plant to the CalAm system, establishes a water entitlement of 206 afy from the CalAm system for Sand City, separate from the city's current water allocation; the ordinance indicates that the remaining 94 afy is permanently added to the broader CalAm's system.

Seaside

- Seaside adopted its General Plan in 2004, and adopted its General Plan Housing Element in 2011 (City of Seaside, 2004a, 2011a).

- According to the General Plan, the city will have a total of about 12,300 dwelling units, 19,800 square feet of non-residential development, and a population of about 43,000 at buildout of the General Plan, assuming the average levels of development allowed under the plan. While the General Plan's estimate does not indicate how much of this overall development is existing development and how much represents expected future growth, a comparison of the buildout estimates for housing and population with 2010 census data for Seaside indicates that under General Plan buildout the city expects to add almost 1,500 new housing units and 10,000 new residents. The General Plan identifies the need for more employment opportunities and tax-generating land uses to improve the overall quality of life in the City, and includes policies to encourage regional commercial and visitor-serving commercial development, community-serving retail development, fuller use of underutilized properties, development that helps increase the City's ratio of jobs to housing, and provision of a variety of housing types that complement employment opportunities in the community.

- AMBAG's Regional Housing Need Allocation for 2007-2014 states that Seaside needs 589 additional units.[28] The City's 2011 Housing Element says that the City can accommodate 1,113 additional units on vacant and underutilized residential and mixed use properties.

- The 2011 Housing Element states that lack of adequate water supply is one of the three primary environmental constraints to the development of housing in Seaside. The other constraints are environmental hazards on former Fort Ord lands and significant biological resources in the eastern portion of the city. General Plan policies call for cooperating with regional and local water providers to ensure that adequate water supply is available to meet

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[27] AMBAG's RHNA for the 2014-2023 period (AMBAG, 2014b), which the next version of jurisdictions' Housing Elements will cover, identified a housing need in Sand City of 55 units.

[28] AMBAG's RHNA for the 2014-2023 period (AMBAG, 2014b), which the next version of jurisdictions' Housing Elements will cover, identified a housing need in Seaside of 393units.

the needs of existing development and future growth; encouraging the production and use of recycled water; protecting and enhancing local and regional groundwater and surface water resources; eliminating long-term groundwater overdraft as soon as feasible; and reviewing development proposals to ensure that adequate water supply, treatment, and distribution capacity is available to meet the needs of the proposed development.

- For the part of the city served by CalAm, which is the area that had been within the City boundaries before the City annexed the former Fort Ord lands to the north and east,[29] the portion of MPWMD's allocation that the City's had allotted for residential use has been exhausted and the City has established a waiting list pending the allocation of future supply. Part of the allocation the City had reserved for economic development in mixed use projects is still available. In a comment on the 2015 MPWSP DEIR, the City stated that a water supply assessment prepared in 2008 for the West Broadway Urban Village Specific Plan determined that water credits for the commercial areas and residential units that were being redeveloped would supply some but not all of the water needed for the specific plan, and that a net increase of 80 afy was estimated above exiting water use to accommodate full buildout of the specific plan (City of Seaside, 2015). This information refines the estimated demand for general plan buildout that was provided to MPWMD in 2006 (shown as "Future Supply Needs (2006 Estimate)" in Table 6.3-7). Therefore, Seaside's estimate of future water supply needs, shown in Table 6.3-7 and in Table 2-6 in Chapter 2, increased by 80 afy. Water for former Fort Ord lands annexed to the city is provided via the FORA and MCWD, not CalAm.[30]

Monterey County

The facts and figures presented in this section pertain to the County as a whole (or the unincorporated County as a whole, as noted), although CalAm does not serve the whole County.

- The *2010 Monterey County General Plan* (Monterey County, 2010a) was adopted in October 2010 and the *County of Monterey 2015-2023 Housing Element* (Monterey County, 2016) was adopted in January 2016. The General Plan has a 2030 planning horizon, while the EIR prepared for the General Plan (Monterey County, 2010b, 2010c) considers conditions under the plan in 2030 and under plan buildout, estimated to occur in 2092.

- The County's population increased from 247,450 in 1970 to an estimated population of 425,756 in 2014. The decade with the fastest growth was 1980-1990, during which the population increased by 22 percent. Data from the 2010 census indicate that the County's population increased by 3 percent between 2000 and 2010. The California Department of Finance's estimate of county population in 2014 (presented in the Housing Element) represents a 2.5 percent increase from 2010. The proportion of the county's population living in unincorporated areas has gradually decreased, from 29 percent in 1980 to 24 percent in 2010.

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29 The part of the city that had been within the city limits prior to the annexation of former Fort Ord lands, which is also the part of the city within the jurisdiction of the MPWMD, is variously referred to in the general plan as the southwestern portion of the city, southwest Seaside, the central core of the city, and Seaside proper. Part of this central core of the city is also served by the City-operated Seaside Municipal System, which operates three groundwater wells that serve the Del Monte Heights neighborhood.

30 Seaside was allocated 748 af of the FORA's total supply to serve the Fort Ord annexation lands in North Seaside. The City does not expect this allocation to increase in the near future, and the General Plan identifies the use of recycled water for golf courses and other non-potable uses in North Seaside as the best option for expanding the availability of the North Seaside allocation for economic development and residential uses.

- Growth assumptions for the General Plan's 2030 planning horizon are based on AMBAG's 2004 population growth forecast, which projected that the county would grow from an estimated population of 464,847 in 2010 to 602,731 in 2030, a 30 percent increase. AMBAG projected that the population in unincorporated county areas would grow from 105,485 in 2010[31] to 135,375 in 2030, a 28 percent increase. The General Plan EIR notes that, in allocating the projected growth within the County, AMBAG considered growth trends and the availability of water among other factors. The Monterey Peninsula was projected to accommodate much lower levels of growth than the Salinas Valley due to the peninsula's greater water constraints.

- AMBAG's Regional Housing Need Allocation for 2014-2023 states that the unincorporated Monterey County needs 1,551 additional housing units. The 2016 Housing Element indicates that, since January 1, 2014, 185 units had been built, and another 2,955 units had been approved. Because those units do not completely meet the RHNA targets for affordable units, however, the County still needs 208 units of very low, low, and moderate income housing. The County determined that the remaining allocation of 208 very low, low, and moderate income units could fit within areas covered by adopted community and area plans including the Castroville Community Plan, the North County Land Use Plan, the Central Salinas Area Plan, (Chualar, King City, and San Lucas Areas) and the South County Area Plan (Bradley and San Ardo areas).

- According to the General Plan EIR, implementing the plan would increase water demand over the planning period. When the EIR was published, although CalAm's Coastal Water Project was forecasted to meet the then-current demand on the Monterey Peninsula, the General Plan EIR anticipated that new or expanded water supply facilities and new or expanded water entitlements would be needed to meet future demand on the peninsula. The General Plan prohibits new development that requires a discretionary permit, and that will use water, unless there is proof that a long-term, sustainable water supply is available to serve the development. The General Plan also requires that tentative subdivision maps be denied until the applicant provides evidence of a long-term sustainable water supply for all of the proposed lots. To ensure the accuracy and consistency of water supply evaluations, the Monterey County Health Department must coordinate with the MCWRA to develop guidelines and procedures for conducting water supply assessments and determining water availability. Other policies call for the County to work with all of the agencies responsible for managing existing and new water resources. As a mitigation measure, the General Plan EIR added a General Policy stating that the County will participate in regional coalitions to identify and support a variety of new water supply projects, water management programs, and multiple agency agreements that will provide additional domestic water supplies for the Monterey Peninsula and the Seaside basin. According to this new policy, the County's general objective is to complete the cooperative planning of these water supply alternatives within five years of adoption of the General Plan and to implement the selected alternatives within five years of that. The County recognizes, though, that timing will depend on the dynamics of the regional group. Other General Plan policies encourage the use of gray water and cisterns for commercial and multi-family residential landscaping; the use of recycled water as a potable water offset; and the establishment of ordinances that identify conservation measures to reduce demand for agricultural water and potable water.

- The Greater Monterey Peninsula Area Plan encourages development projects to get their water from public utilities or mutual water companies. If this is not possible, the County

[31] 2010 census data indicate that the County's population in 2010 was 415,057, somewhat lower than the 2004 forecast anticipated; according to the census the population of the unincorporated county in 2010 was 100,213.

should consider the cumulative effects of the development's water use on wildlife, fish, and plant communities, and the supply available to existing users.

- The Carmel Valley Master Plan requires that pumping from the Carmel River aquifer be managed consistent with the Carmel River Management Program and that all beneficial uses of the total water resources of the Carmel River and its tributaries be considered in planning decisions. Other policies support water projects designed to address future growth in the Carmel Valley and encourage the establishment of regulations limiting development in Carmel Valley to vacant lots of record and already-approved projects, unless additional water supplies are identified.

Monterey Peninsula Airport District

- The Monterey Peninsula Airport District is developing a new master plan, a process that is expected to take two years. A draft plan has been prepared, but CEQA documentation has not been completed and the new plan has not been adopted. Until a new master plan is adopted, the Airport District’s 1992 Monterey Peninsula Airport Master Plan Update Final Report (Master Plan) (Monterey Peninsula Airport District, 1992) is the applicable land use planning document for airport development activities (Johnston, 2013).

- The goals of the 1992 Master Plan are to address airport requirements over a 20-year planning period. 2010 is the horizon year for specific aspects of the plan including projected airport activity and facility requirements. Based on anticipated changes in the fleet mix and projected growth in the number of passengers, annual operations (take-offs and landings), and general aviation aircraft based at the airport, the Master Plan was intended to meet the identified need for additional terminal areas, general aviation hangars, and aviation fuel storage, an expanded fire station, a larger maintenance building, and vehicle access improvements. The Master Plan includes three concepts each for the terminal area, the west end of the airport, and the northside of the airport, and recommends adoption of one of them, called “Concept C”, for each of the three components. Each of the concepts would increase the area for the terminal ramp, the size of the terminal building, the number of parking places, the number of hangars, and the amount of space available for fixed-base operators, other tenants, and airport support facilities.

- Master Plan Appendix B, Utilities Inventory and Pavement Plan, reviews water service to the airport. The review states that past cases before the CPUC that concerned the adequacy of the water supply system for the Monterey Peninsula may restrict CalAm from serving new territory until additional supplies are assured, or until additional impounding reservoirs are built. The discussion concludes, however, that the airport lies completely within the water company’s existing service area, that service to the airport property is long-standing, that airport water use is not excessive, and that curtailment of water for use by the Airport is not expected.

- In a discussion of past studies related to the airport, the Master Plan states that the environmental document for the 1983 Airport and Runway Development Program concluded that development of the northside industrial area would require water service that was not currently allocated to the Airport District, and that the District would need to work with MPWMD to resolve the issue to the extent possible. The Master Plan also discusses a 1987 EIR for the Comprehensive Land Use Plan for the Monterey Peninsula Airport which identified water resources as an area of controversy (Monterey Peninsula Airport District, 1992).

Comparison of Proposed Water Supply Capacity with MPWMD Estimate of Future Supply Needs

The project supply components that would provide water for future development (e.g., water for lots of record) do not directly compare to the levels of growth planned for and described in the jurisdictions' general plans. To relate the portion of MPWSP supply that would support future development to the growth anticipated in jurisdictions' adopted general plans, the MPWSP supply is compared with the estimate of future water supply needs that the MPWMD prepared in 2006 (MPWMD, 2006).[32]

The 2006 MPWMD estimate was a comprehensive assessment of long term water needs of customers in CalAm's Monterey District main distribution system based on information obtained from the service area jurisdictions. It included demand associated with expected remodels within the jurisdictions, and with anticipated development of single-family and multi-family residences, secondary units, and non-residential development expected to occur under buildout of each jurisdiction's general plan. The MPWMD translated the growth estimate provided by the jurisdictions into water demand using water use factors for different land use categories. The estimate also included repayment of any water credits owed to property owners for implementing water-saving retrofits, and a 20 percent contingency to address unforeseen water requirements. Based on this assessment, the estimated future water supply needs to support growth anticipated in the general plans of the jurisdictions in the CalAm service area totaled 4,545 afy.[33] The 2009 EIR prepared for CalAm's proposed Coastal Water Project evaluated in detail whether the growth assumptions underlying MPWMD's 2006 demand estimate were consistent with growth anticipated in the jurisdictions' general plans, and confirmed that, overall, the MPWMD's estimate of future demand was consistent with growth under the general plans.[34] That analysis is included in **Appendix J1** for reference.

Since the 2006 estimate was prepared, the future water needs of four jurisdictions have been revised, reducing the total estimate of future water needs from 4,545 to 3,526 afy. The new Monterey County General Plan, adopted in 2010, is the basis for one of the revisions; the City of Pacific Grove provided another revision, reducing its original 2006 estimate of future demand in testimony that the City provided regarding the MPWSP; the City of Seaside provided a revision that increased its estimate of future water demand; and the water entitlement that Sand City has from construction of its 300-afy desalination plant would cover roughly half of Sand City's 2006

[32] As noted in Section 2.5.3.4 of Chapter 2, Water Demand, Supplies, and Water Rights, the MPWMD plans to collaborate with CalAm and the service area jurisdictions to evaluate the added water supply capacity needed to meet general plan buildout projections. Given that this new MPWMD process has not yet started and that most of the general plans considered in the 2006 evaluation are still in effect, this EIR uses the 2006 MPWMD analysis, adjusted as noted below, as the basis for comparison.

[33] Because the jurisdictions' general plans were prepared in different years and covered different planning periods, MPWMD did not characterize its estimate of future demand as accommodating growth over a given period of time or to a given year. The estimate was intended, however, to accommodate growth reasonably expected by each jurisdiction consistent with its adopted general plan.

[34] The analysis determined that with a few exceptions, the estimates of residential growth were consistent with estimates contained in the general plans or general plan housing elements. Estimates of non-residential development were more difficult to compare because of substantial differences in the levels of detail in information submitted by jurisdictions to the MPWMD compared with information included in the general plans; to the extent the development potential could be compared, the estimates were determined to be consistent.

estimated future demand. Refer to the discussion of general plan buildout in Chapter 2, Water Demand, Supplies, and Water Rights, Section 2.5.3.4, for more information on the revised estimates.

California Water Code Section 10608 requires water suppliers to reduce per capita water consumption 20 percent by 2020, relative to baseline demand calculated under Department of Water Resources guidelines. According to CalAm's 2010 UWMP, current per capita consumption in CalAm's Monterey District is already below its 20 percent reduction target (WSC, 2012). Nevertheless, conservatively assuming that the Water Code 20 percent reduction target could apply to the water use assumptions MPWMD used in its 2006 estimate, the revised estimate of future water needs discussed above, reduced by an additional 20 percent, would be 2,820 afy. **Table 6.3-8** shows these estimates of future water supply needs.

TABLE 6.3-8
FUTURE WATER DEMAND AND AVAILABLE SUPPLIES: TWO RETURN WATER SCENARIOS
(acre-feet per year)

Future Demands and Supplies	Jurisdiction Total
Future Supply Needs (2006 Estimate)	4,545
Future Supply Needs (Revised)[a]	3,526
Future Supply Needs (Revised and Reduced by 20%)[b]	2,820
MPWSP Supply for Future Development[c] Assuming 6% SVGB Return	1,829
MPWSP Supply for Future Development[c] Assuming 12% SVGB Return	209
MPWSP Supply for Future Development[c] as % of Future Supply Needs (Revised)[d]	6 to 52%
MPWSP Supply for Future Development[c] as % of Future Supply Needs (Revised and Reduced)[d]	7 to 65%

NOTES: SVGB = Salinas Valley Groundwater Basin

a Future supply needs revised based on changes in future demand estimates in four service area jurisdictions (discussed in more detail in Section 2.5.3.4 of Chapter 2).

b Estimated future supply needs reduced by an additional 20 percent should water reduction requirements of Water Code Section 10608 apply. CalAm's Monterey District 2010 UWMP indicates that the service area has already met its 20 percent reduction target.

c Supply available for future development consists of MPWSP supply and CalAm's other supplies, shown in Table 2-4 of Chapter 2, minus existing demand and minus estimated SVGB return water obligations shown in Table 6.3-4.

d Lower percentage of supply available to meet future development needs assumes 12 percent SVGB return water obligation; higher percentage assumes 6 percent SVGB return water obligation

SOURCES: Table 2-4, Table 2-5, Table 6.3-4.

As discussed in Section 6.3.5.1 and shown in Table 6.3-4, during the 25-year Seaside Groundwater Basin replenishment period, the portion of the water supply provided by the MPWSP and other supply sources that would be available for future development – including the future development assumed for the MPWSP shown in Table 6.3-3 – would range from 1,829 afy to 209 afy after meeting estimated SVGB return water obligations of 6 percent to 12 percent, respectively. Assuming a 6 percent SVGB return water obligation, the 1,829 afy of supply that would be available to meet future needs would represent 52 percent of 3,526 afy, the 2006 estimate of future water supply needs as revised based on updated information. This 1,829 afy of available supply would represent 65 percent of 2,820 afy, the 2006 estimate of future demand as updated and reduced by an additional 20 percent. Thus, assuming a 6 percent SVGB return water obligation, available supply would meet a half to two-thirds the estimated future water supply needs of the service area. Assuming a 12 percent SVGB return water obligation, during the Seaside Groundwater Basin Replenishment period, the 209 afy of supply that would be available to meet future needs would represent 6 percent of 3,526 afy and 7 percent of 2,820 afy, the two updates of MPWMD's 2006 estimate of future water supply needs discussed above. Thus, based on the updates of future demands and these return water assumptions, the portion of the water supply provided by the MPWSP that would be available to support future development would supply from less than 10 percent to 65 percent of the water demand associated with planned growth, depending primarily on the return water obligation. Table 6.3-8 summarizes these estimates.

The 1,430 afy of MPWSP supply that is proposed for anticipated development, shown in Table 6.3-3, is about 40 percent of 3,526 afy, the 2006 estimate of future demand as revised based on updated information and about half of 2,820 afy, the 2006 estimate of future demand as updated and reduced by an additional 20 percent.

As discussed above in this section, MPWMD's 2006 estimate of future water supply needs was generally consistent with the level of growth planned for in the adopted general plans of service area jurisdictions. The MPWSP would provide less water for growth than the 2006 estimate of future water supply needs as revised based on updated information (3,526 afy, or 2,820 afy if further reduced by 20 percent). The smaller MPWSP supply that would be available to support future development would similarly be consistent with the service area's planned growth.

6.3.5.4 Delivery of SVGB Return Water to Castroville

Delivery of SVGB Return Water to Castroville Community Services District

The community of Castroville, located north of the desalination plant and outside of CalAm's service area, would receive Salinas Valley Groundwater Basin (SVGB) return water (see **Section 2.5.1** in **Chapter 2**, **Water Demand**, **Supplies**, **and Water Rights**, and **Section 3.2.3.9** in **Chapter 3**, **Description of the Proposed Project**. The water would flow to the Castroville Community Services District (CCSD) for domestic use in lieu of groundwater pumping. The SVGB return water supply would only be used to replace, or offset, CCSD's current use of groundwater (approximately 800 afy), under the terms of the Return Water Settlement Agreement (CalAm et al., 2016b). Thus, the water provided by the desalination plant would not remove water supply constraints as an obstacle to additional development in the Castroville area and therefore would not induce growth. The pipeline that would be built to convey the desalinated product water to the CCSD system would be sized to accommodate the 800 afy volume of return water. Although increased pumping pressure can increase a pipeline's capacity, as discussed above in Section 6.3.5.2, the use of the pipeline to the CCSD would be limited to providing return water to offset CCSD's current groundwater use. Therefore, pipeline capacity is not anticipated to expand in the future, and building this pipeline would not remove an obstacle to growth in the Castroville area.

Delivery of SVGB Return Water to the Castroville Seawater Intrusion Project

Under the proposed project, the MPWSP would deliver the first 800 afy of SVGB return water to the CCSD and deliver the remaining return water to the Castroville Seawater Intrusion Project

(CSIP). The CSIP provides recycled water to farmers in the Castroville area to irrigate crops, thereby enabling reduced pumping of seawater-tainted groundwater. SVGB return water in excess of that needed for the CCSD would supplement the recycled water currently available to CSIP from the Monterey Regional Water Pollution Control Agency. Return water provided to the CSIP would be used to offset groundwater use for agricultural production; it would not contribute to domestic water supply and therefore would not be growth-inducing.

6.3.6 Secondary Effects of Growth

Impact 6.3-1: Secondary effects of planned growth.

The MPWSP would support a degree of planned growth in the jurisdictions served by the proposed project. In general, development planned and approved through the general plan process in the CalAm service area would have environmental impacts. The environmental consequences of this planned growth have been largely addressed in local plans and the associated CEQA review as well as in other, project-specific documentation. Some of the identified indirect effects of growth are significant and unavoidable; others are significant but can be mitigated.

Although most of the general plan EIRs reviewed for this EIR/EIS were prepared prior to the passage of the California Global Warming Solutions Act of 2006, and do not include assessments of impacts of greenhouse gas emissions, it is expected that planned growth in the area could contribute to significant and unavoidable increases in greenhouse gas emissions (e.g., from increased fossil fuel use for transportation and construction, increased industrial and commercial activities, residential energy use, operation of power plants, and oil refining).

The following environmental documents for city and county general plans and general plan elements were reviewed in order to identify the significant impacts associated with planned growth in the area:

- City of Carmel-by-the-Sea, 2015b. *Addendum to Initial Study/Negative Declaration, City of Carmel-by-the-Sea 2015-2023 Housing Element and Related Zoning Amendments,* November 18, 2015. (Addendum to *City of Carmel-by-the-Sea 2007-2014 Housing Element Public Review Draft Initial Study / Mitigated Negative Declaration,* April 2010.)
- City of Del Rey Oaks, 1997b. *Final Environmental Impact Report for the General Plan Update Project*, May 16, 1997.
- City of Monterey, 2004. *City of Monterey General Plan Update Draft Environmental Impact Report* and *Final Environmental Impact Report, State Clearinghouse No. 2003081011*, October 11, 2004.
- City of Sand City, 2001. *Expanded Environmental Impact Study and Proposed Negative Declaration, General Plan Update 2001-2016*, October 12, 2001.
- City of Sand City, 2009. *Sand City 2009 Housing Element Initial Study and Negative Declaration,* December 16, 2009.
- City of Seaside, 2004b. *Final Seaside General Plan EIR*, January 2004.

- City of Seaside, 2010. *Public Review Draft Initial Study/Proposed Negative Declaration for the of Seaside Local Coastal Program,* August 2010.
- City of Seaside, 2011b. *Public Review Draft Initial Study/Proposed Negative Declaration: City of Seaside Housing Element Update 2009-2014,* September 2010, adopted by the Seaside City Council January 27, 2011.
- Monterey County, 2010b, 2010c. *Monterey County General Plan Final Environmental Impact Report, SCH No. 2007121001,* March 2010, and *Revised Supplemental Materials to the Final EIR (October 15, 2010),* October 2010.
- Monterey County Resource Management Agency, 2010. *Initial Study: Housing Element 2009-2014,* April 19, 2010.
- U.S. Department of the Army, 2013a. *Final Environmental Impact Statement, Real Property Master Plan, Presidio of Monterey, California,* February 2013.

Copies of these documents are available for review at the respective city and county planning departments.

Table 6.3-9 summarizes the environmental effects associated with planned growth in the project area, as identified in the general plan EIRs for the jurisdictions in the CalAm service area. Because the table reflects the determinations of multiple jurisdictions, some impacts are listed as both significant and unavoidable and significant but mitigable, reflecting differences among the jurisdictions in the service area. In addition, one EIR evaluates general plan impacts over two time periods: the planning horizon for the plan and buildout. As a result, some impacts were identified as significant and unavoidable, and significant but mitigable, depending on the timeframe. Under CEQA Guidelines Section 15130, the EIRs prepared for the jurisdictions' general plans evaluate the potential for development under the respective plans to contribute to cumulative impacts on the environment; significant cumulative impacts identified in the general plan EIRs are also shown in the table. **Appendix J2**, **Table J2-1** presents a more detailed summary of the growth impacts and mitigation measures identified in the EIRs for general plans in the CalAm service area. These environmental impacts are the indirect effects of growth that would be supported in part by the proposed project.

6.3.6.1 MPWSP Role in Addressing the Indirect Effects of Growth

Two jurisdictions in the area served by the proposed project – the City of Seaside and Monterey County – identified demand for, or impacts related to, water supply, including groundwater supply, as significant and unavoidable impacts of planned growth; other service area jurisdictions identify similar significant but mitigable impacts. In general, these impacts identify insufficient supply to meet demands associated with development that is planned for in the jurisdictions' general plans. Some EIRs address impacts associated with supply limitations, such as the potential risk of over-pumping groundwater resources and seawater intrusion, and many acknowledge the limitations on current supply sources imposed by SWRCB Order 95-10. With respect to the impacts of potential over-pumping of the Seaside Groundwater Basin and the associated threat of seawater intrusion, the MPWSP is sized to enable CalAm to "repay" to the groundwater basin, over a 25-year period, the amount of water it has pumped in excess of its

TABLE 6.3-9
SIGNIFICANT IMPACTS ASSOCIATED WITH PLANNED GROWTH IN THE PROJECT AREA

Significant and Unavoidable Impacts

- Degradation of visual character or quality of the area and surroundings
- Substantial new sources of light and glare
- Cumulative impacts on aesthetics, light and glare
- Conversion of farmland to non-agricultural use and cumulative loss of farmland
- Construction-related air quality impacts
- Net change in ozone precursor and particulate matter emissions
- Cumulative air quality impacts
- Effects on special status species
- Effects on riparian habitat and other sensitive natural communities
- Cumulative impacts on biological resources
- Potential effects on archaeological, paleontological, or historic resources
- Cumulative exposure to wildland fire hazard
- Increased demand for water supply and/or water storage, treatment, and conveyance facilities and associated secondary effects[a]
- Substantial depletion of groundwater supply[b]
- Increased demand on groundwater in areas experiencing or susceptible to saltwater intrusion[b]
- Cumulative impacts on surface and groundwater quality[c]
- Cumulative indirect impacts of water supply projects[a]
- Increased flood hazard and impacts from flooding
- Increases in cumulative traffic noise
- Induced population growth
- Effects on adjacent land uses of operation of new or expanded schools
- Local and regional traffic impacts
- Impacts of cumulative development on traffic
- Demand for water resources that exceed available water supply[d]
- Cumulative impacts on water supply[d]
- Contribution to cumulative greenhouse gas emissions and global climate change

Significant but Mitigable Impacts

- Adverse effects on scenic vistas
- Adverse effects on scenic or historic resources within a state scenic highway
- Degradation of visual character or quality of the area and surroundings
- Construction-related air quality impacts
- Transportation-related air quality impacts
- Exposure to increased diesel exhaust
- Emission of objectionable odors
- Effects on special-status species
- Effects on riparian habitat and other sensitive natural communities
- Effects on federally protected wetlands
- Conflicts with local policies or ordinances protecting biological resources
- Effects on a variety of biological resources
- Interference with migratory patterns or wildlife corridors
- Potential effects on migratory birds and raptors
- Introduction of exotic species
- Potential effects on archaeological, paleontological, or historic resources
- Exposure of new development to potential seismic or geologic hazards
- Creation of or exposure of new development to hazards related to soil erosion or expansive soils
- Exposure of new development to tsunami or seiche hazards

TABLE 6.3-9 (Continued)
SIGNIFICANT IMPACTS ASSOCIATED WITH PLANNED GROWTH IN THE PROJECT AREA

Significant but Mitigable Impacts (cont.)

- Potential exposure of people and development, including schools, to hazardous materials releases
- Increased risk of hazardous materials releases
- Safety hazards from development near airports
- Increased flood hazard and impacts from flooding
- Exposure of structures to increased risk of wildland fires
- Cumulative wildfire hazard exposure
- Impacts on water quality, including groundwater quality[c]
- Impacts on hydrology and surface water
- Substantial depletion of groundwater supplies[b]
- Increased demand on groundwater in areas experiencing or susceptible to saltwater intrusion[b]
- Inconsistency with zoning code
- Conflicts between incompatible land uses
- Impacts on open space areas
- Exposure of existing and new sensitive land uses to increased noise
- Increases in construction, traffic, stationary, and/or airport noise
- Potential conflicts between new development and existing or expanded recreational uses
- Effects of park construction and degradation of parks or recreational facilities
- Demand for new or expanded parks and recreational facilities
- Increased demand for law enforcement and/or fire protection services
- Effects of school construction to accommodate new development
- Local and regional traffic impacts
- Decreased parking capacity
- Increased demand for transportation alternatives
- Demand for water resources that exceed available water supply[d]
- Require construction of new water supply and treatment facilities[e]
- Increased demand for additional sewer or stormwater drainage infrastructure
- Increased demand for and Impacts of new or expanded public utilities and facilities
- Exposure of property and persons to otherwise avoidable physical harm due to climate change

NOTES:

[a] While the County General Plan EIR impact analysis identifies the impacts of providing additional water supply as *secondary* or indirect effects, Chapter 4 of this EIR/EIS evaluates the *direct* effects of constructing and operating the MPWSP in addition to the indirect effects of growth described in this chapter.

[b] The MPWSP is intended to provide sufficient supply for CalAm to reduce pumping from the Seaside Groundwater Basin to no more than CalAm's adjudicated right, and to "repay," over a 25-year period, the amount of water CalAm has pumped in excess of its adjudicated right since the adjudication, while meeting the water demands shown in Table 6.3-1.

[c] The effects of the proposed project on surface water and groundwater quality, including cumulative effects, are evaluated in Sections 4.3 and 4.4, respectively, of Chapter 4 of this EIR/EIS. As stated above in Note b, the proposed project would help eliminate the need for over-pumping of the Seaside Groundwater Basin in order to meet current demand, thereby helping to mitigate impacts on groundwater quality caused by seawater intrusion.

[d] The MPWSP would provide sufficient supply to enable CalAm to comply with the SWRCB Order 95-10 and Cease and Desist Order and the Seaside Groundwater Basin Adjudication while meeting current water demands and a degree of additional demands, as shown in Table 6.3-1 and discussed in this chapter. The MPWSP is not sized, however, to meet anticipated water demand under full buildout of the service area jurisdictions' general plans.

[e] This impact was identified in the Mitigated Negative Declaration prepared for the Sand City General Plan; since then, after completing required CEQA review Sand City constructed a desalination plant that is providing the City and the CalAm service area new source of water supply. The impacts of constructing the MPWSP are evaluated in this EIR.

SOURCES: City of Del Rey Oaks, 1997b; City of Monterey, 2004; City of Sand City, 2001; City of Seaside, 2004b; Monterey County, 2010b, 2010c; U.S. Army, 2013a.

adjudicated right since the groundwater basin was adjudicated. (Refer to Section 2.2.4 in Chapter 2, Water Demand, Supply, and Water Rights, for more information.) The supply to be provided by the MPWSP would thus help address the potential impacts of over-pumping the Seaside Groundwater Basin. The MPWSP would provide some water beyond that needed to meet existing demand (discussed above in Section 6.3.5.1) but not the full amount identified in MPWMD's 2006 assessment of future supply need, as adjusted by more recent information (discussed above in Section 6.3.5.3). The MPWSP would thus help address impacts related to a supply that does not meet current and projected future water supply needs within the service area jurisdictions. The MPWSP is not expected to fully meet projected future demands, however. With respect to the physical effects of providing additional water supply – that is, building and operating the proposed infrastructure – this EIR/EIS evaluates the potential impacts of the MPWSP and identifies mitigation measures to reduce those impacts to the extent feasible.

6.3.6.2 Authority to Mitigate Effects of Growth

CalAm, the CPUC, and MBNMS do not have the authority to make land use decisions or to approve growth. As described in Section 6.3.2, the authority to regulate growth, and by extension to mitigate the environmental effects of growth, resides primarily with land use planning agencies. **Table 6.3-10** identifies the agencies with the authority to implement measures to avoid or mitigate the environmental impacts of growth in the area served by the proposed project;[35] the agencies generally fall into two categories, as discussed below.

- Agencies with primary authority over land use planning and CEQA lead agency status for approval of land use plans, permits and other approvals.
- Agencies responsible for stewardship of environmental resources.

Implementation of Environmental Protection Measures by Land Use Planning Agencies

Cities and counties (for unincorporated areas) have the greatest authority over land use decisions within their jurisdictions, through implementation of their general plans, locally adopted ordinances and regulations to manage growth, and development approval processes. Some ordinances and policies adopted at the local level (e.g., ordinances establishing urban growth limit lines, protecting natural resources such as riparian habitat, or establishing resource conservation easements) are intended to avoid or reduce environmental impacts.

In their capacities as lead agencies under CEQA (California Public Resources Code Section 21002 and Section 21067), cities and counties also have the authority and responsibility to evaluate the environmental impacts that would result from the implementation of plans and individual development projects within their jurisdictions, and to adopt measures to mitigate any significant adverse impacts. Cities and counties must identify mitigation measures in the CEQA documents for these plans and projects, must adopt feasible measures within their authority, and must adopt programs to monitor and report on their implementation, as conditions of approval.

[35] While MBNMS does not have authority to make land use decisions, NOAA does have authority to mitigate impacts on biological resources through Section 7 and Section 10 consultation requirements, as shown in Table 6.3-9.

TABLE 6.3-10
AGENCIES WITH THE AUTHORITY TO IMPLEMENT OR REQUIRE IMPLEMENTATION OF MEASURES TO AVOID OR MITIGATE GROWTH-RELATED IMPACTS

Agency	Authority
Planning Agencies	
Cities within the Area Served by Project	***Planning and Enforcement.*** Responsible for planning, land use, and environmental protection of the area within the city's jurisdictional boundaries and adoption of the general plan governing this area. Responsible for enforcing city environmental policies through zoning and building codes and ordinances.
	CEQA. Cities typically act as the lead agency for CEQA compliance for development projects in incorporated areas; as such they bear responsibility for adopting measures to mitigate the project's significant direct and indirect impacts on the environment and programs to ensure that mitigation measures are successfully implemented.
Monterey County	***Planning and Enforcement.*** Responsible for planning, land use, and environmental protection of unincorporated areas and adoption of the general plan governing unincorporated county lands. Responsible for enforcing County environmental policies through zoning and building codes and ordinances.
	CEQA. Counties typically act as the lead agency for CEQA compliance for development projects in unincorporated areas; as such they bear responsibility for adopting measures to mitigate the project's significant direct and indirect impacts on the environment and programs to ensure that mitigation measures are successfully implemented.
Local Agency Formation Commission	Empowered to approve or disapprove all proposals to incorporate cities, to form special districts, or to annex territories to cities or special districts. Also empowered to guide growth of governmental service responsibilities.
California Coastal Commission	Issues Coastal Development Permits for development in the Coastal Zone, except where the local jurisdiction has an approved Local Coastal Program. Retains coastal development permit authority over development on the immediate shoreline, tidelands, submerged lands, and certain public trust lands, and over major public works projects.
U.S. Environmental Protection Agency	Responsible for writing regulations and setting national standards to implement a variety of federal environmental protection and human health laws. In California, EPA has delegated much of the authority to enforce the Clean Air Act, Clean Water Act and Drinking Water Quality Act to state agencies, but it retains some oversight. EPA also comments on the environmental review of projects by participating in the NEPA process.
Water Resources	
State Water Resources Control Board (SWRCB)[a]	Shares responsibility with the regional water quality control boards (RWQCBs) to protect and restore water quality; approves regional basin plans; provides support to regional boards; and administers surface water rights. Develops water quality control plans and polices where water quality issues cross regional boundaries or have statewide application.
Central Coast RWQCB	Shares responsibility with SWRCB to protect and restore water quality. Formulates and adopts water quality control plans. Implements portions of the Clean Water Act when EPA and SWRCB delegate authority, as is the case with issuance of NPDES permits for waste discharge, reclamation, and storm water drainage.
California Department of Public Health	Responsible for ensuring the purity and potability of domestic water supplies. Assists the SWRCB and the RWQCBs in setting quality standards.
Monterey Peninsula Water Management District	Responsible for managing water resources on the Monterey Peninsula. Allocates water to jurisdictions; issues permits for new or expanded water distribution systems and water connections; and adopts water conservation ordinances.
Air Resources	
California Air Resources Board[a]	Responsible for adopting and enforcing standards, rules, and regulations for the control of air pollution from mobile sources throughout the state. Also responsible for developing plans and regional reduction targets for greenhouse gas emissions.
Monterey Bay Unified Air Pollution Control District	Adopts and enforces local regulations governing stationary sources of air pollutants within the North Central Coast Air Basin. Issues Authority to Construct Permits and Permits to Operate. Provides compliance inspections of facilities and monitors regional air quality. Develops Clean Air Plans in compliance with the Clean Air Act.

TABLE 6.3-10 (Continued)
AGENCIES WITH THE AUTHORITY TO IMPLEMENT OR REQUIRE IMPLEMENTATION OF MEASURES TO AVOID OR MITIGATE GROWTH-RELATED IMPACTS

Agency	Authority
Biological Resources	
National Oceanic and Atmospheric Administration (NOAA), National Ocean Service, Office of National Marine Sanctuaries	Under NOAA's National Marine Sanctuary Program requirements, authorization by the Monterey Bay National Marine Sanctuary's superintendent is required for any permit, lease, license, approval, or other authorization issued or granted by a federal, state, or local agency for prohibited activities within the sanctuary.
National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries)	Requires consultation under Section 7 or Section 10 of the Endangered Species Act for projects that could impact endangered or threatened species under the purview of NOAA Fisheries. Prepares biological opinions on the status of species in specific areas and potential effects of proposed projects. Approves reasonable and prudent measures to reduce impacts and establishes Habitat Conservation Plans.
U.S. Fish and Wildlife Service (USFWS)	Requires consultation under Section 7 or Section 10 of the Endangered Species Act for projects which could impact endangered or threatened species. Prepares biological opinions on the status of species in specific areas and potential effects of proposed projects. Approves reasonable and prudent measures to reduce impacts and establishes Habitat Conservation Plans.
U.S. Army Corps of Engineers	Issues permits to dredge or place fill in waters of the United States, including wetlands, under the Clean Water Act. Required to consult with USFWS and NMFS regarding compliance with the federal Endangered Species Act.
California Department of Fish and Wildlife	Issues Stream Bed Alteration Agreements for projects potentially impacting waterways. If specific criteria are met, issues incidental take permits for projects that would take species listed the California Endangered Species Act. Under the Natural Community Conservation Planning Act, provides oversight for the development of regional Natural Community Conservation Plans, which aim to balance ecosystem protection and land use.

NOTE:

[a] These agencies fall under the umbrella of the California Environmental Protection Agency.

SOURCE: ESA

Implementation of Environmental Protection Measures by Resource Management Agencies

Federal, state, and regional resource-specific agencies are responsible for ensuring that impacts to specific resource categories are mitigated through the regulatory processes summarized in **Table 6.3-10**. Through their permitting authority, these agencies mitigate the impacts of proposed land uses and enforce the provisions of adopted resource protection plans (e.g., water basin plans and air basin plans). For example, the Central Coast Regional Water Quality Control Board identifies specific requirements and water quality standards for facilities by issuing waste discharge requirements, and the Monterey Bay Unified Air Pollution Control District addresses the effects of pollutant emissions by issuing permits to build and operate stationary sources of air emissions.

Conclusion

Significant and Unavoidable. The MPWSP would not directly contribute to the creation of additional housing or jobs within the area it would serve, as it is limited construction and operation of water supply facilities and infrastructure. But the proposed project would indirectly support growth by removing some water supply limitations as an obstacle to growth, thereby enabling a degree of growth under the approved general plans within the area served by the MPWSP.

The cities and county in the area served by the proposed project have the authority to approve or deny development projects and to impose mitigation to address significant environmental impacts associated with development projects within their respective jurisdictions. In addition, numerous federal, state, regional, and local agencies are specifically charged with protecting environmental resources, and ensuring that planned development occurs in a sustainable manner. Together, these agencies exercise the authority to reduce the effects of development on the environment. Some unavoidable impacts would still, however, be expected to occur.

6.3.7 Growth Inducement Potential of Cumulative Water Supply Projects

This section considers the indirect growth inducement potential of the cumulative projects identified in **Table 4.1-2**. The geographic scope for the cumulative analysis of indirect growth inducement consists of the CalAm service area jurisdictions and other areas of Monterey County that could experience similar indirect growth inducement. The baseline environmental setting against which the MPWSP is being analyzed includes the effects of existing, operational water supply projects identified in Table 4.1-2 such as the Seaside Groundwater Basin Aquifer Storage and Recovery projects (Nos. 29 and 30), and Sand City Coastal Desalination Plant (No. 6), which are assumed in water supply planning undertaken for the proposed project (as discussed in Chapter 2, Section 2.4 and shown in Table 2-4). The CalAm Slant Test Well at CEMEX (No. 47) is assumed to be used for production of the proposed MPWSP supply.

Several of the planned future cumulative projects identified in Table 4.1-2 would provide new sources of potable water supply in Monterey County. The Monterey Bay Regional Water Project (DeepWater Desal) (No. 34) would provide water to the City of Salinas as well as parts of Santa Cruz County. If both the MPWSP and DeepWater Desal were approved, water from DeepWater Desal could be used to support growth in other nearby areas such as northern Monterey County. The RUWAP Desalination Element (No. 31) would serve the Marina Coast Water District’s Ord Community with approximately 1,000 afy of potable supply. Through an agreement with FORA and the MRWPCA, an additional 1,400 afy of potable supply from the Pure Water Delivery and Supply Project (RUWAP #35 in Table 4.1-2) would meet the build-out needs of the Ord Community (which is contiguous with CalAm’s service area). The Granite Ridge Water Supply Project would increase water supply availability for the area of northern Monterey County that it would serve. The Interlake Tunnel project would reduce the amount of water spilled at Nacimiento Dam by allowing water from Nacimiento Reservoir to be stored at San Antonio Reservoir for later use. This project would enhance flood control, provide environmental benefits, and offset groundwater pumping. Because this project would provide groundwater recharge, this analysis assumes it could indirectly augment supply available for groundwater users, including municipal supply that could serve additional growth. Although the primary purpose of the Salinas Valley Water Project Phase II (No. 1) is to combat seawater intrusion by providing a new source of surface water to offset groundwater consumption, the availability of a reliable surface water supply provided by this project could induce growth by removing supply reliability limitations as an obstacle to urban development.

Growth induced by one or more of these cumulative water supply projects in combination with the proposed project would result in secondary effects of growth in Monterey County that are similar to, but would likely be more severe and widespread than, those summarized above in Table 6.3-9; these impacts include increased traffic, noise, and air pollution and loss of open space and biological resources.

Other water projects listed in Table 4.1-2, including the RUWAP Recycled Water Project (No. 35), West Broadway Stormwater Retention Project (41), Del Monte Boulevard Dry Weather Diversion project (44), Pacific Grove Local Water Project (No. 22), Pacific Grove Recycled Water Project (No. 23), and Monterey Pacific Grove Area of Special Biological Significance (ASBS) Stormwater Management Project (No. 45) would either provide non-potable recycled water supply or enhance groundwater recharge. Projects providing recycled water could offset demand for potable supply that is currently used for non-potable uses, thereby making that potable supply available for other uses including growth. Projects capturing and diverting stormwater runoff to enhance groundwater recharge would primarily improve surface water quality and help stop seawater intrusion, but may overtime increase the availability of groundwater supply. These projects could contribute to the growth-inducing impacts of the cumulative potable supply projects described above by increasing the availability of existing potable supplies and groundwater.

As stated in Table 4.1-2, because the Peoples' Project would serve the same customers as the MPWSP, it is not reasonably foreseeable as a cumulative project but instead is considered an alternative to the MPWSP. The Pure Water Monterey Groundwater Replenishment (GWR) Project is not a cumulative project in the context of the proposed project or any alternative that includes a 9.6-mgd desalination plant built and operated by CalAm, because if the GWR is implemented, CalAm would not need to construct a 9.6-mgd desalination plant. The GWR Project is a cumulative project in the context of Alternatives 5a and 5b, which evaluate a 6.4-mgd desalination plant. The cumulative growth inducement of implementing the GWR and Alternative 5a or 5b and the other water supply projects discussed here would be similar to the cumulative growth inducement of the proposed project because water supply available to the CalAm service area with implementation of the GWR project plus Alternative 5a or 5b would be similar to the supply provided by the proposed project.

6.4 Project Consistency with Monterey Bay National Marine Sanctuary Desalination Guidelines

In 2010, MBNMS, in collaboration with the California Coastal Commission, California Central Coast Regional Water Quality Control Board, and NOAA Fisheries, published Guidelines for Desalination Plants in Monterey Bay National Marine Sanctuary, which was a strategy in the desalination action plan included in the 2008 MBNMS Final Management Plan (described in Section 4.5, Marine Biological Resources) (MBNMS, 2010). These non-regulatory guidelines were developed to help ensure that any future desalination plants in the sanctuary would be sited, designed, and operated in a manner that results in minimal impacts on the marine environment. They address numerous issues associated with desalination including site selection, construction and operational impacts, monitoring and reporting, plant discharges, and intake systems.

General provisions in the Guidelines outline the desired approach for developing desalination projects, demonstrating project need, designing alternatives, and complying with NEPA, including the following:

- Desalination plant proponents should pursue collaborations with other water suppliers and agencies currently considering water supply options in the area to evaluate the potential for an integrated regional water supply project. This should include an evaluation of other potential desalination locations and alternatives, as well as other forms of water supply;
- Desalination should only be considered when other preferable alternatives for meeting water needs, such as increased conservation and wastewater recycling are maximized or otherwise determined not feasible, and it is clear that desalination is a necessary component of the region's water supply portfolio;
- Project proponent should provide a complete evaluation of the need for a desalination plant. This should include a background of the water supply situation and discussion and evaluation of alternatives that have been considered to obtain the necessary volume of water; including the potential to use other economically and environmentally preferable alternatives including increased conservation, brackish water desalination, and wastewater recycling to meet some or all of the water needs of a proposed project; and
- Desalination plant proponents should provide a thorough analysis of the potential impacts on the coastal ecosystem for the proposed desalination plant and all project alternatives and plans to mitigate any potential impacts, or recover any resources that may be disturbed during construction.

The scope of this EIR/EIS analysis complies with the above Guideline provisions outlining the required elements of impact analysis. The key guidelines with specific recommendations that are relevant to the proposed project and alternatives are listed in **Table 6.4-1**, along with summaries of the proposed project and alternatives' consistency with each guideline. Potential inconsistencies associated with the alternatives are also addressed in individual issue area analyses in Section 5.5. The Guidelines are not applicable to the No Project Alternative and therefore, this alternative is not included in the table.

TABLE 6.4-1
ASSESSMENT OF PROJECT CONFORMITY WITH GUIDELINES FOR DESALINATION PLANTS IN MONTEREY BAY NATIONAL MARINE SANCTUARY

Summary of NOAA Desalination Guidelines	Summary of MPWSP Conformity with Guidelines	Section of EIR/EIS Containing Additional Information
Guidelines Regarding Cumulative Impacts (Sec. D.3, p. 5)		
Desalination plants should be designed, sited, and operated to avoid or minimize cumulative impacts. The project proponent should provide a detailed analysis on the potential cumulative effects of the proposed discharges in combination with other existing and future point sources of pollution (i.e., wastewater discharges, power plant cooling water, and other desalination plants) as well as non-point sources of pollution (i.e., large rivers and outfalls) and other seawater intakes. Where it is feasible to combine the desalination discharge with another discharge, the project proponent should compare the likely effects of the combined discharges with the two separate discharges.	**Proposed Project - Consistent**. The proposed project would utilize the existing MRWPCA treated effluent discharge pipeline, outfall, and diffuser to discharge brine into MBNMS. The dense brine discharge would be released alone during the irrigation season, and blended with varying volumes of secondary treated wastewater during the winter months. Cumulative impacts of the brine-only and combined discharges are fully analyzed in Chapter 4 of this EIR/EIS. Impacts on MBNMS resources from the brine-only and cumulative discharges would be less than significant with implementation of the proposed mitigation. The proposed project would not contribute to a cumulatively significant impact. **Alts. 1 and 2 – Consistent.** Same discharge as proposed project. **Alt. 3 – Potentially Inconsistent.** The discharge would not be combined with existing discharges.[36] **Alt. 4 – Potentially Inconsistent.** The discharge would not be combined with existing discharges. **Alt. 5a/5b – Consistent.** Same combined discharge as proposed project and less discharge due to smaller project.	• Overview, Section 4.1 • Surface Water Hydrology and Water Quality, Sections 4.3.5 and 4.3.6 • Marine Biological Resources, Section 4.5.5 • Alternatives Analysis Section 5.5.3 and 5.5.5 • Appendices D1, D2 and D3 (brine plume and water quality modeling)
Guidelines for Entrainment and Impingement (Sec. D.3, p. 6)		
All desalination plants should be designed and sited to avoid and minimize impingement and entrainment to the extent feasible. Project proponents should investigate the feasibility of using subsurface intakes as an alternative to traditional intake methods. Other options for consideration should include, but may not be limited to: vertical and radial beach wells, horizontal directionally drilled (HDD) and slant-drilled wells, seabed filtration systems and other structures beneath the sea floor. Where feasible and beneficial, subsurface intakes should be used. It must be ensured however, that they will not cause saltwater intrusion to aquifers, negatively impact coastal wetlands that may be connected to the same aquifer being used by the intake, and they must address the likelihood of increased coastal erosion in the future. Subsurface intakes have the potential to minimize or eliminate impingement and entrainment impacts and improve the performance and efficiency of a desalination project by providing a certain level of pretreatment.	**Proposed Project - Consistent**. The proposed project would utilize subsurface intakes that penetrate the sea floor of MBNMS and avoid impingement and entrainment of marine biological resources. The proposed project would have a less than significant impact on groundwater supply and recharge, and subsurface intakes would facilitate the reduction of seawater intrusion in the long term. In addition, proposed slant wells would be located inland of the modeled anticipated inland extent of coastal retreat, but the rate of retreat may vary due to unforeseen changes in climate change. Therefore, the slant wells could become located on the beach within the project lifetime, a significant impact that would be reduced to a less than significant impact with Mitigation Measure 4.2-9 (Slant Well Abandonment Plan). **Alt. 1 – Potentially Inconsistent.** Subsurface intakes would be used similar to the proposed project, but coastal wetlands may be affected by groundwater drawdown.	• Description of the Proposed Project, Section 3.2.1 • Geology and Soils, Section 4.2.5 • Groundwater Resources, Section 4.4.5 • Marine Biological Resources, Section 4.5.5 • Alternatives Analysis, Section 5.3, 5.5.4 and 5.5.5 • Appendices C1 (Sea Level Rise) and C2 (Coastal Erosion) • Appendix E2 (North Marina Groundwater Model)

[36] The proponent of this alternative is investigating the feasibility of combining discharge with the Moss Landing Power Plant, but the current proposed project is a standalone new discharge pipeline. Should a combined discharge be determined feasible, that option would be evaluated in the DeepWater Desal project CEQA/NEPA document.

TABLE 6.4-1 (Continued)
ASSESSMENT OF PROJECT CONFORMITY WITH GUIDELINES FOR DESALINATION PLANTS IN MONTEREY BAY NATIONAL MARINE SANCTUARY

Summary of NOAA Desalination Guidelines	Summary of MPWSP Conformity with Guidelines	Section of EIR/EIS Containing Additional Information
Guidelines for Entrainment and Impingement (Sec. D.3, p. 6) (cont.)		
	Alts. 2, 3, and 4 – Potentially Inconsistent. Open water intake would cause impingement and entrainment. **Alt. 5a – Consistent.** Similar to proposed project. **Alt. 5b – Potentially Inconsistent.** Drawdown effects similar to Alternative 1.	
Any impacts on essential fish habitat (EFH) and the biota it supports that cannot be avoided through project design or operations will require mitigation, as per NMFS' regulatory requirements. The necessary level of mitigation is to be determined through the use of a biologically based model, such as the habitat production foregone method, in order to account for all "non-use" impacts on affected biota. Mitigation projects should attempt to directly offset the impacted species or habitat (in-place, in-kind mitigation) although NOAA will work with the project proponent to identify appropriate mitigation if this is not possible.	**Proposed Project - Not Applicable**. Essential Fish Habitat is not present in the project study area. The proposed project does not include any construction activities on the sea floor; operation of the proposed slant wells and discharge of brine into MBNMS would not affect EFH. **Alt. 1 – Potentially Inconsistent.** Effects on Elkhorn Slough resources are identified as significant and unavoidable and no feasible mitigation has been identified. **Alts. 2, 3, and 4 – Not Applicable.** The location is not within EFH. **Alt. 5a – Not Applicable.** The location is not within EFH, same as the proposed project. **Alt. 5b –** Same as Alternative 1.	• Marine Biological Resources, Section 4.5.5 • Alternatives Analysis Section 5.5.5
Guidelines for Brine Discharge (Sec. D.3, pp. 6-7)		
All desalination plants should be designed to minimize impacts from the discharge. Project proponents should investigate the feasibility of diluting brine effluent by blending it with other existing discharges. The proponent should evaluate the use of measures to minimize the impacts from desalination plant discharges including discharging to an area with greater circulation or at a greater depth, increasing in the number of diffusers, increasing the velocity while minimizing the volume at each outlet, diluting the brine with seawater or another discharge, or use of a subsurface discharge structure.	**Proposed Project - Consistent**. The proposed project would utilize the existing MRWPCA outfall and diffuser in MBNMS to discharge brine from the desalination process. Brine would generally be discharged alone during the irrigation season, and combined with intermittent flows of treated wastewater in the non-irrigation season. Brine discharge modeling evaluated salinity and water quality impacts on receiving waters for six flow scenarios. Impacts were determined to be less than significant with implementation of Mitigation Measures 4.3-4 (Operational Discharge Monitoring Analysis, Reporting, and Compliance) and 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives). **Alts. 1 and 2 – Consistent.** Same as proposed project. **Alts. 3 and 4 – Potentially Inconsistent.** The discharge would not be combined with existing discharges. **Alt. 5a/b – Consistent.** Same as proposed project.	• Surface Water Hydrology and Water Quality, Section 4.3.5 • Alternatives Analysis Section 5.5.3. • Appendices D1, D2 and D3 (brine plume and water quality modeling)

TABLE 6.4-1 (Continued)
ASSESSMENT OF PROJECT CONFORMITY WITH GUIDELINES FOR DESALINATION PLANTS IN MONTEREY BAY NATIONAL MARINE SANCTUARY

Summary of NOAA Desalination Guidelines	Summary of MPWSP Conformity with Guidelines	Section of EIR/EIS Containing Additional Information
Guidelines for Brine Discharge (Sec. D.3, pp. 6-7) (cont.)		
The project proponent should provide a detailed evaluation of the projected short-term and long-term impacts of the brine plume on marine organisms based on a variety of operational scenarios and oceanographic conditions: ● Brine plume modeling should address different types of seasonal ocean circulation patterns, including consideration of "worst case scenarios." ● Modeling results should be included, to illustrate how the plume will behave during variable oceanographic conditions. The plume model should estimate salinity concentrations at the discharge point, as well as where and when it would reach ambient ocean concentrations. The extent, location, and duration of the plume where the salinity is 10% above ambient salinity should also be provided. ● Information should be provided on the physical and chemical parameters of the brine plume including salinity, temperature, metal concentrations, pH, and oxygen levels. These water quality characteristics of the discharge should conform to California Ocean Plan requirements and should be as close to ambient conditions of the receiving water as feasible.	**Proposed Project - Consistent**. Brine plume dilution modeling was conducted for six flow scenarios, assuming no current at the sea floor and ignoring orbital velocities from waves. Additional dilution modeling was conducted for the Final EIR/EIS. Brine plume effects were evaluated for salinity levels in the pipe, adjacent to the diffuser, within the zone of initial dilution (ZID), along the sea floor to the edge of the brine mixing zone (BMZ) (+100 meters from the diffuser) and beyond. Input to the brine plume model included temperature and salinity levels within the ambient water column for three ocean circulation patterns, which encompass the range of seasonal patterns typical of this area. Brine plume effects on physical and chemical parameters, including salinity, temperature, metal concentrations, pH, and dissolved oxygen, and all constituents regulated under the Ocean Plan are addressed in Impact 4.3-4 and Impact 4.3-5. Mitigation Measures 4.3-4 (Operational Discharge Monitoring Analysis, Reporting, and Compliance) and 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives) would reduce impacts on receiving waters to a less than significant impact, thus the project conforms to Ocean Plan requirements. **Alts. 1 and 2 – Consistent.** Same discharge as proposed project. **Alt. 3 – Consistent.** Concentrations of the discharges would be more than proposed project, but would conform to Ocean Plan requirements. **Alt. 4 – Potentially Inconsistent.** Brine plume modeling has not been conducted to support claim that diffuser will be effective in meeting Ocean Plan requirements. **Alt. 5a/5b – Consistent.** Same as the proposed project. Brine discharge would be slightly less volume than the proposed project, but overall findings and mitigation measures are the same as identified above.	● Surface Water Hydrology and WQ, Section 4.3.5 ● Marine Biological Resources, Section 4.5.5 ● Alternatives analysis, Section 5.5.3 and 5.5.5. ● Appendices D1, D2 and D3 (brine plume and water quality modeling)
A continuous monitoring program should be implemented to verify the actual extent of the brine plume, when deemed necessary (see Monitoring section below) and to determine if the plume is impacting EFH, critical habitat, or sanctuary resources. If it is, then mitigation for the EFH impact will be required.	**Proposed Project - Consistent**. To ensure that operational discharges are in compliance with the Ocean Plan, CalAm shall implement Mitigation Measure 4.3-4 (Operational Discharge Monitoring Analysis, Reporting, and Compliance), which requires a Monitoring and Reporting Plan that includes specific water quality monitoring protocols and frequencies to assess baseline conditions and track Project compliance. Continuous monitoring is required one year prior to commencement of operational discharges and for a minimum of five years after operational discharges commence. EFH is not present within the study area. **All Alternatives – Consistent.** The same monitoring mitigation measure identified for the proposed project would apply to all alternatives.	● Surface Water Hydrology and WQ, Sections 4.3.5 ● Alternatives Analysis Section 5.5.3

TABLE 6.4-1 (Continued)
ASSESSMENT OF PROJECT CONFORMITY WITH GUIDELINES FOR DESALINATION PLANTS IN MONTEREY BAY NATIONAL MARINE SANCTUARY

Summary of NOAA Desalination Guidelines	Summary of MPWSP Conformity with Guidelines	Section of EIR/EIS Containing Additional Information
Guidelines for Energy Use and Greenhouse Gas Emissions (Sec. D.3, p. 7)		
The project proponent should provide estimates of a facility's projected annual electricity use and the greenhouse gas emissions resulting from that use. Applicants should also identify measures available to reduce electricity use and related emissions (e.g., energy efficient pumps, low resistance pipes, use of sustainable electricity sources, etc.) and to mitigate for all remaining emissions (e.g., purchase of offsets and/or credits that are consistent with the policies and guidelines of the California Global Warming Solutions Act of 2006 (AB 32), etc.).	**Proposed Project - Consistent**. Section 4.11, Greenhouse Gas Emissions, provides estimates of the proposed project's anticipated total operational emissions, including those from indirect emissions, exhaust emissions, brine degassing emissions, annual electricity demand, and disturbance of carbon sequestration. The analysis provides the net increase in electrical power demand, and greenhouse gas emissions for CO_2, N_20, CH_4, and CO_2e. The proposed project includes numerous energy conservation measures, including energy recovery using pressure-exchanger technology, which is expected to substantially reduce overall energy consumption during the reverse osmosis process. GHG emission impacts would be less than significant with these energy saving measures and implementation of Mitigation Measure 4.11-1 (GHG Emissions Reduction Plan) that would require employment of additional energy conservation technologies and would ensure that operational energy use requirements result in net zero GHG emissions through renewable energy procurement and/or purchase of offsets. **All Alternatives – Consistent.** The alternatives analysis evaluates electricity use and associated greenhouse gas emissions for each alternative and identifies mitigation measures for alternatives.	• Project Description, Chapter 3 • Greenhouse Gas Emissions, Section 4.11.5 • Energy Conservation, Section 4.18 • Alternatives Analysis, Section 5.5.11 and 5.5.18
Guidance for Co-location with Power Plant (Sec. D.3, p. 7)		
Desalination plants proposing to co-locate with power plant once-through cooling systems should include an assessment, during the environmental documentation phase, of the impacts that would occur when the power plant cooling system does not operate, along with an analysis of alternative intake and outfall structures that would avoid or minimize these impacts.	**Proposed Project – Not applicable**. The proposed project is not co-located with a power plant. **All Alternatives – Not applicable**. None of the alternatives would be co-located with a power plant once through cooling system.	Not applicable
Guidance for Co-location with Sewage Treatment Facilities (Sec. D.3, p.8)		
In consideration of recent interest by many municipalities regarding water recycling projects, the project proponent should evaluate the continued availability and reliability of that discharge in the future due to the potential for additional wastewater recycling projects. Additionally, where treated wastewater is available for recycling, proponents should determine the feasibility of using it as the source water to be desalinated for use in groundwater recharge – i.e., indirect potable reuse.	**Proposed Project - Consistent**. MRWPCA certified the Final EIR and approved the Groundwater Replenishment Project (GWR) in October 2015. In September 2016, the CPUC authorized CalAm to purchase 3,500 afy of purified recycled water from the MRWPCA and MPWMD. If the GWR Project is successful at developing water, CalAm would build a reduced-size desalination project (6.4-mgd) (Alternative 5a) and utilize the GWR Project, which would advance treat a variety of water sources including wastewater, stormwater, food industry processing water, and impaired surface waters of the State.	• Water Demand and Supplies, Section 2.4.5, Groundwater Replenishment • Overview, Section 4.1, Table 4.1-2, Cumulative Project #59 • Alternatives, Sections 5.4.7 and 5.4.8 Reduced Project Desalination Plant

TABLE 6.4-1 (Continued)
ASSESSMENT OF PROJECT CONFORMITY WITH GUIDELINES FOR DESALINATION PLANTS IN MONTEREY BAY NATIONAL MARINE SANCTUARY

Summary of NOAA Desalination Guidelines	Summary of MPWSP Conformity with Guidelines	Section of EIR/EIS Containing Additional Information
Guidance for Co-location with Sewage Treatment Facilities (Sec. D.3, p.8) (cont.)		
	Alts. 1, 2, 3, 4 – Consistent. Since the GWR project is separate from the proposed project, it is assumed that other alternatives may be able to use resources resulting from this recycled water project. **Alt. 5a/5b – Consistent.** Same as the proposed project.	
The project proponent should provide a thorough analysis of the potential impacts on marine organisms resulting from the combined properties of the discharge, as well as how the addition of brine effluent would affect the dispersal/dilution of the wastewater effluent.	**Proposed Project - Consistent**. Impacts on marine organisms from the brine-only discharge, and a discharge of brine combined with treated wastewater effluent, are analyzed in Impacts 4.5-4, 4.5-5, and 4.5-6; proposed project impacts on marine biological resources would be less than significant. Brine plume modeling included analysis of the effects of the brine on wastewater effluent dispersal/dilution. **All Alternatives – Consistent.** Impacts on marine organisms from brine discharge associated with alternatives are analyzed and disclosed in Chapter 5 of the EIS/EIR. Chapter 5 also provides impact conclusions for each alternative.	• Surface Water Hydrology and WQ, Section 4.3.5 • Marine Biological Resources, Section 4.5.5 • Alternatives Section 5.5.5 • Appendices D1, D2 and D3 (brine plume and water quality modeling)
The project proponent should evaluate diurnal fluctuations in wastewater discharge operations. When modeling for dilution of the brine plume, it is crucial to include a "worst case scenario" analysis of the dilution properties of the combined wastewater effluent and brine plume, during lowest expected flow rates for the treated wastewater effluent. The project proponent should include an assessment of the impacts that would occur from brine discharge if the wastewater discharge were to cease.	**Proposed Project - Consistent**. Brine modeling evaluated and the EIR/EIS presents the impacts from six operational scenarios ranging from baseline wastewater-only discharges to "worst case" brine-only discharges. The brine-only discharge would exceed 2ppt for a very small area above the sea floor, and it would be less than 2 ppt above ambient at the edge of the ZID, the point at which the plume contacts the sea floor (less than 30 feet from the point of discharge). **Alts. 1 and 2 – Consistent.** Same as the proposed project. **Alts. 3 and 4 – Not Applicable.** Combined discharge is not proposed. **Alt. 5a/5b – Consistent.** Same as the proposed project, but less discharge volume.	• Surface Water Hydrology and WQ, Section 4.3.5 • Marine Biological Resources, Section 4.5.5 • Alternatives Analysis Section 5.5.3 and 5.5.5 • Appendices D1, D2 and D3 (brine plume and water quality modeling)
Guidelines for Use of Chemicals for Treatment and Cleaning (Sec. D.3, p. 8)		
The project proponent should provide a complete list of all chemicals that may be used for the desalination facilities, as well as the quantities of chemicals and how these will be stored and disposed. They should also include an evaluation of the potential for these chemicals to cause impacts on local marine organisms. This should also include a detailed spill prevention and response plan for chemicals stored at the project site.	**Proposed Project - Consistent**. A list of chemicals and their proposed annual usage in the desalination process is presented for the proposed project in Table 3-3 and Table 4.7-5 and includes standard treatment chemicals such as Sodium Hypochlorite, Sodium Bisulfite, Carbon Dioxide, Lime, Sodium Hydroxide, and Zinc Orthophosphate. Information regarding storage and disposal is in Impact 4.7-6. The desalination plant would be located approximately 1.75 miles from the MBNMS and chemical usage and storage at the desalination plant would not cause impacts on local marine organisms. CalAm would be required to implement the project in accordance with all applicable laws and regulations governing hazardous materials storage, handling, and	• Description of the Proposed Project, Section 3.2.2.4 • Hazards and Hazardous Materials, Section 4.7.5.2 • Alternatives Section 5.5.7

TABLE 6.4-1 (Continued)
ASSESSMENT OF PROJECT CONFORMITY WITH GUIDELINES FOR DESALINATION PLANTS IN MONTEREY BAY NATIONAL MARINE SANCTUARY

Summary of NOAA Desalination Guidelines	Summary of MPWSP Conformity with Guidelines	Section of EIR/EIS Containing Additional Information
Guidelines for Use of Chemicals for Treatment and Cleaning (Sec. D.3, p. 8) (cont.)		
	disposal. Chemicals used in the pretreatment process will be disposed of as sludge in a sanitary landfill. Spent cleaning solutions and waste effluent for the RO System would be discharged into a collection sump, chemically neutralized, then pumped into tank trucks and transported offsite for disposal. Spill prevention measures and a response plan would be included in the SWPPP and the Hazardous Materials Business Plan. **All Alternatives – Consistent.** The use of chemicals would be similar to the proposed project and chemical use is evaluated in the Alternatives Chapter 5. All alternatives will be required to prepare spill prevention and response plans.	
The project proponent should evaluate the feasibility of using alternative pretreatment techniques such as ozone pretreatment, subsurface intakes, and membrane filtration, aimed at reducing the use of chemicals.	**Proposed Project - Consistent**. The proposed project would use pretreatment techniques including subsurface intakes, pressure filters or multimedia gravity filters, backwash supply and filtered water equalization tanks, backwash settling basins with decanting system, cartridge filters, filtered water pumps, and backwash supply pumps. **Alt. 1 – Consistent.** Same as the proposed project. **Alts. 2, 3, and 4 – Potentially Inconsistent.** Open water intake. **Alt. 5a/5b – Consistent.** Same as the proposed project.	• Description of the Proposed Project, Chapter 3 • Alternatives description, Section 5.4
Guidelines for other Environmental and Socioeconomic Impacts (Sec. D.3, p.9)		
Desalination plants should be designed and operated to minimize impacts on recreational and commercial activities that occur within MBNMS. The project proponent should provide a thorough evaluation of the potential impacts on recreation, public access and safety, including but not limited to potential impacts on SCUBA divers, kayakers, recreational boaters, and commercial and recreational fishermen.	**Proposed Project - Consistent**. The MPWSP Desalination Plant itself would not be located within MBNMS; slant wells from onshore locations would extend into the submerged lands of MBNMS. The proposed project is consistent with regional and local plans and policies designed to promote and protect public safety and recreational opportunities. No construction or operational activities proposed by the MPWSP would impact divers, kayakers, boaters or fishermen. Public access to Fort Ord Dunes State Park could be temporarily disrupted during pipeline construction, but mitigation would ensure continued vehicular, pedestrian and bicyclist access; lateral access would not be affected. **Alt. 1 – Consistent.** Similar to the proposed project, but construction at the Potrero Road parking lot would temporarily limit vertical beach access. Alternative access routes are available and mitigation measures are identified to ensure continued access. Lateral beach access would not be affected. **Alt. 2 – Consistent.** Same as the proposed project. **Alt. 3 – Potentially consistent.** Offshore construction may affect recreational and commercial activities in MBNMS; however, the effects would be short-term.	• Land Use, Land Use Planning, and Recreation, Section 4.8 • Table 4.8-2 Applicable Regional and Local Land Use Plans and Policies Relevant to Land Use and Recreation • Alternatives Section 5.5.8

TABLE 6.4-1 (Continued)
ASSESSMENT OF PROJECT CONFORMITY WITH GUIDELINES FOR DESALINATION PLANTS IN MONTEREY BAY NATIONAL MARINE SANCTUARY

Summary of NOAA Desalination Guidelines	Summary of MPWSP Conformity with Guidelines	Section of EIR/EIS Containing Additional Information
Guidelines for other Environmental and Socioeconomic Impacts (Sec. D.3, p.9) (cont.)		
	Alt. 4 – Potentially consistent. Offshore construction may affect recreational and commercial activities in MBNMS and onshore construction at the caisson may preclude beach access. The effects would be short-term. **Alt. 5a – Consistent.** Same as the proposed project. **Alt. 5b – Consistent.** Same as Alternative 1.	
Desalination plants should not interfere with vertical or lateral public access to the shoreline or to coastal waters.	**Proposed Project - Consistent**. (See previous row) Construction of the proposed new Transmission Main would temporarily close 1 of 3 entrances to Fort Ord Dunes State Park. Implementation of Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan), would provide continued safe access. The subsurface slant wells would be set back from the beach at a distance that would not preclude public access on the beach. No other proposed components would interfere with vertical or lateral public access to the shoreline or coastal waters. **All Alternatives.** Same as previous row regarding public access and recreation.	• Land Use, Land Use Planning, and Recreation, Section 4.8 • Traffic and Transportation, Section 4.9 • Alternatives Section 5.5.8 and 5.5.9
Desalination plants in MBNMS should not contribute to coastal retreat and should not be designed to anticipate the possibility of installing coastal armoring at any time in the future to protect the plant or its infrastructure from the effects of coastal erosion, wave action, or sea level rise.	**Proposed Project - Consistent**. The only proposed component that could become vulnerable to coastal retreat during the project lifetime is the existing test slant well. CalAm would implement Mitigation Measure 4.2-10 (Slant Well Abandonment Plan), which would require annual monitoring of the rate of coastal retreat and abandonment of the facility when necessary. CalAm would remove the susceptible facility prior to its exposure or potential contribution to coastal retreat. No coastal armoring is planned to protect the subsurface slant wells. **Alt. 1 – Consistent.** The slant wells would be located inland of the modeled future coastal erosion and would not be subject to coastal erosion or contribute to coastal retreat. **Alt. 2 – Consistent.** No facilities are proposed within an area subject to coastal erosion or retreat. Pipelines would be 100 feet below the surface where crossing the coastline. **Alt. 3 – Consistent.** Same as Alternative 2. **Alt. 4 – Potentially Inconsistent.** Continued use and improvements of the existing Caisson in the shore zone may be subject to coastal erosion and could necessitate armoring. **Alt. 5a – Consistent.** Same as the proposed project. **Alt. 5b – Consistent.** Same as Alternative 1.	• Geology and Soils, Impact 4.2-10 • Alternatives Section 5.5.2 • Appendix C2, Analysis of Historic and Future Coastal Erosion with Sea Level Rise.

TABLE 6.4-1 (Continued)
ASSESSMENT OF PROJECT CONFORMITY WITH GUIDELINES FOR DESALINATION PLANTS IN MONTEREY BAY NATIONAL MARINE SANCTUARY

Summary of NOAA Desalination Guidelines	Summary of MPWSP Conformity with Guidelines	Section of EIR/EIS Containing Additional Information
Guidelines for other Environmental and Socioeconomic Impacts (Sec. D.3, p.9) (cont.)		
Desalination plants should be designed to minimize visual impacts on coastal resources.	**Proposed Project - Consistent**. The MPWSP Desalination Plant would minimize coastal visual impacts on resources because of its inland location. The subsurface slant wells and associated facilities at CEMEX would be located in an area with moderate aesthetic resource value. The site's dune topography and vegetation would substantially limit views of the slant well sites from locations outside of the CEMEX property, including from the beach and from Hwy 1. Views from the beach would be nearer and longer in duration compared to roadside views, but the above ground facilities would not appear dominant relative to surrounding features and would not obstruct coastal views. As a result, these facilities would minimize visual impacts on coastal resources. Furthermore, mitigation has been identified to reduce impacts on coastal views. **Alt. 1 – Consistent.** Similar to the proposed project. **Alt. 2 – Consistent.** No facilities are planned in the shore area. The intake pump station would be on Dolan Road in an industrial area. The desalination plant site is the same as the proposed project. **Alt. 3 – Consistent.** No facilities are planned in the shore area and the desalination plant site is inland of the coastal area. **Alt. 4 – Potentially Inconsistent.** The Sandholdt Road pump house structure would be visible within the coastal area and would affect scenic coastal views. Mitigation has been identified to reduce the impact to less than significant, but visual resources may still be affected. **Alt. 5a – Consistent**. Same as the proposed project. **Alt. 5b – Consistent.** Same as Alternative 1.	• Aesthetic Resources, Section 4.14.5 • Alternatives Analysis Section 5.5.14
The project proponent should provide an analysis of the potential population growth-inducing impacts of the desalination project. This should be compared for consistency with projected development patterns in relevant planning documents such as Local Coastal Programs and the County's General Plan. NOAA recommends that the freshwater production capacity of all desalination projects be consistent with established local government land use policies in county and city general plans and local coastal programs.	**Proposed Project - Consistent**. The proposed project is sized to provide existing customers with a reliable water supply, accounting for peak month demand; to accommodate tourism demand under a recovered economy; to provide supplies for vacant legal lots of record; and for Pebble Beach Entitlements. The direct effects on population and housing were determined to be less than significant. The indirect growth inducement potential of the MPWSP was evaluated in conjunction with population and housing forecasts prepared by the Association of Monterey Bay Area Governments and with projections from local General Plans or specific plans. While the MPWSP would provide sufficient supply to enable CalAm to comply with the SWRCB Order 95-10 and the Seaside Groundwater Basin Adjudication (see Table 6.3-1), it would provide some water for growth. The indirect impacts of that growth were identified in the EIRs prepared for the general and specific plans that guide that growth. **Alts. 1 and 2 – Consistent.** Same as the proposed project.	• Population and Housing, Section 4.19 • Alternatives Section 5.5.19 • Growth-Inducing Impacts, Section 6.3 • Alternatives Section 5.5.21 • Secondary Effects of Growth, Appendix J2

TABLE 6.4-1 (Continued)
ASSESSMENT OF PROJECT CONFORMITY WITH GUIDELINES FOR DESALINATION PLANTS IN MONTEREY BAY NATIONAL MARINE SANCTUARY

Summary of NOAA Desalination Guidelines	Summary of MPWSP Conformity with Guidelines	Section of EIR/EIS Containing Additional Information
Guidelines for other Environmental and Socioeconomic Impacts (Sec. D.3, p.9) (cont.)		
	Alt. 3 – Potentially Inconsistent. The substantially larger size of this alternative would allow more growth than the proposed project and it is not certain that this growth would be consistent with land use policies and general plan growth projections. **Alt. 4 – Potentially Inconsistent.** The slightly larger size of this alternative would allow more growth than the proposed project and it is not certain that this growth would be consistent with land use policies and general plan growth projections. **Alt. 5a/5b – Consistent**. Same as the proposed project.	
Guidelines for Plant Site Selection and Structural and Engineering Considerations (Sec. D.3, pp. 9-10)		
Desalination plant intakes should be sited to avoid sensitive habitats. For open-water intakes, areas of high biological productivity, such as upwelling centers or kelp forests or other dense beds of submerged aquatic vegetation should be avoided, since the entrainment and impingement impacts of a desalination plant are in large part dictated by the biological productivity in the vicinity of that intake.	**Proposed Project - Consistent for MBNMS Resources; Inconsistent for Onshore Resources**. The proposed project would include subsurface intakes under the MBNMS seafloor that avoid impingement and entrainment impacts. No construction is planned on the seafloor surface. Onshore, the proposed project would use subsurface slant wells at the CEMEX sand mining property. A thorough intake alternatives analysis identified the proposed location to minimize impacts. The wellheads would be located on the inland side of the dunes; sensitive communities and critical habitat within or adjacent to the project construction area could be temporarily (9 acres) or permanently (1 acre) impacted during construction. Slant well construction would occur outside of western snowy plover critical habitat. However, conversion of the test slant well to a permanent well and construction of aboveground facilities could indirectly impact the primary constituent elements of this critical habitat if worker foot traffic extends beyond the designated construction work area, if trash and debris is left behind following construction, or if invasive plant species are introduced or spread at the site. Implementation of mitigation measures would reduce impacts on sensitive natural communities and critical habitat resulting from slant well construction to a less-than-significant level. **Alt. 1 – Inconsistent.** The slant well location at the Potrero Road parking lot would not affect any sensitive habitat, but drawdown effects on Elkhorn Slough could affect sensitive species. **Alts. 2 and 3 – Inconsistent.** Construction and operation of a new open water intake system would impact marine biological resources. **Alt. 4 – Inconsistent.** Construction and operation of an extended open water intake system would impact marine biological resources. **Alt. 5a –** Same as the proposed project. **Alt. 5b – Inconsistent.** Same as Alternative 1.	• Description of the Proposed Project, Chapter 3 • Marine Biological Resources Section 4.5 • Terrestrial Biological Resources, Impact 4.6-2 • Alternatives Development and Screening Process, Chapter 5.3 • Alternatives Analysis Sections 5.5.5 and 5.5.6

TABLE 6.4-1 (Continued)
ASSESSMENT OF PROJECT CONFORMITY WITH GUIDELINES FOR DESALINATION PLANTS IN MONTEREY BAY NATIONAL MARINE SANCTUARY

Summary of NOAA Desalination Guidelines	Summary of MPWSP Conformity with Guidelines	Section of EIR/EIS Containing Additional Information
Guidelines for Plant Site Selection and Structural and Engineering Considerations (Sec. D.3, pp. 9-10) (cont.)		
Desalination plant discharges should not be located in or near ecologically sensitive areas, including Areas of Special Biological Significance as designated by the State Water Resources Control Board, EFH Habitat Areas of Particular Concern as designated by the Pacific Fishery Management Council, and Marine Protected Areas designated under the Marine Life Protection Act. These areas include: Elkhorn and Pescadero Sloughs, James V. Fitzgerald Marine Reserve, Año Nuevo, Pacific Grove Marine Gardens, Edward F. Ricketts, Carmel Bay, Point Lobos, Point Sur and Big Creek State Marine Conservation Areas and Marine Reserves, Julia Pfeiffer Burns Underwater Park, and the Ocean Area Surrounding the Mouth of Salmon Creek.	**Proposed Project - Consistent**. The MPWSP Desalination Plant discharges would not be located in or near ecologically sensitive areas. Furthermore, discharges would be combined with existing wastewater discharges. **All Alternatives – Consistent.** Same as proposed project.	• Description of the Proposed Project, Chapter 3 • Marine Biological Resources, Figure 4.5-5 Sanctuary Ecologically Significant Areas Designated in MBNMS • Alternatives Analysis Section 5.5.5
Areas with limited water circulation such as enclosed bays or estuaries, which can “trap” the brine discharge, should be avoided, as should EFH HAPC, such as rocky substrate and kelp forests, due to their high biological productivity. As a general rule, the stronger the hydrodynamic force, the better dilution is achieved due to faster dispersal from the natural mixing action of the ocean. Desalination plant discharges should be designed and sited to minimize impacts on marine biological resources of the sanctuary.	**Proposed Project - Consistent**. The proposed project would utilize the existing MRWPCA ocean outfall in Monterey Bay, within MBNMS. The location is on a shelf with a 1 percent slope towards the Monterey Submarine Canyon; it is not enclosed, not an estuary, and the only hard substrate is the ballast rock supporting the outfall pipe. There are no kelp beds nearby. **All Alternatives – Consistent.** Same as proposed project.	• Marine Biological Resources, Section 4.5, Figure 4.5-1 Identified Subtidal Habitats in Study Area • Alternatives Analysis Section 5.5.5
The project proponent should provide complete plans, which include detailed information on: location, depth, engineering, and configuration of intake and outfall pipes; sizing and configuration of seabed structures; proposed depth and distance from shore of the intake and discharge points; local bathymetry; and dilution zones for each discharge pipeline alternative. The pipeline placement and configuration of intake and discharge structures should be designed as to avoid sensitive biological areas in the sanctuary.	**Proposed Project - Consistent**. The proposed project would utilize an existing outfall and diffuser, and would use subsurface intakes; no proposed intake component would be constructed or placed on the surface of the sea floor. Local bathymetry and dilution zones are provided. **Alt. 1 – Consistent.** Same as the proposed project. **Alt. 2 – Inconsistent.** Construction and operation of a new open water intake system would impact marine biological resources. **Alt. 3 – Inconsistent.** Construction and operation of a new open water intake system and discharge pipeline would impact marine biological resources. **Alt. 4 – Inconsistent.** Construction and operation of an extended open water intake system and discharge pipeline would impact marine biological resources. **Alt. 5a/5b – Consistent.** Same as the proposed project.	• Description of the Proposed Project, Chapter 3, Table 3-1, Sections 3.2.1 and 3.2.2.5, Figure 3-3a MPWSP Seawater Intake System, Figure 3-3b Illustrative Cross-Sectional View of Subsurface Slant Wells • Geology and Soils, Section 4.2, Figure 4.2-7 Representative Profile at Test Slant Well, Figure 4.2-8 Representative Profile at Proposed Slant Wells • Surface Hydrology and WQ, Section 4.3, Figure 4.3-7 Brine Mixing Zone (BMZ) and Diffuser Overview • Marine Biological Resources, Section 4.5, Figure 4.5-1 Identified Subtidal Habitats in Study Area, Figure 4.5-4 Essential Fish Habitat Designated in MBNMS under Federal Regulations, Figure 4.5-5 Sanctuary Ecologically Significant Areas Designated in MBNMS, Figure 4.5-6 Marine Protected Areas along the California Coast • Alternatives Analysis Section 5.5.5 • Appendix D1, Brine Modeling

TABLE 6.4-1 (Continued)
ASSESSMENT OF PROJECT CONFORMITY WITH GUIDELINES FOR DESALINATION PLANTS IN MONTEREY BAY NATIONAL MARINE SANCTUARY

Summary of NOAA Desalination Guidelines	Summary of MPWSP Conformity with Guidelines	Section of EIR/EIS Containing Additional Information
Guidelines for Plant Site Selection and Structural and Engineering Considerations (Sec. D.3, pp. 9-10) (cont.)		
The project proponent should provide an analysis of the potential for co-location of desalination plants to make use of existing infrastructure.	**Proposed Project - Consistent**. The proposed desalination plant would be located adjacent to the MRWPCA and would use the existing outfall pipeline and diffuser. **Alts. 1 and 2 – Consistent.** Same as the proposed project. **Alt. 3 – Inconsistent.** The project would not be co-located. However, the proponent of this alternative is investigating the feasibility of combining discharge with the Moss Landing Power Plant. **Alt. 4 – Partially Consistent.** The project would rehabilitate existing intake and discharge pipeline systems. **Alt. 5a/5b – Consistent.** Same as the proposed project.	• Description of the Proposed Project, Chapter 3.
Guidelines for Desalination Plant Construction Phase (Sec. D.3, pp. 10-12)		
The project proponent should identify and provide a complete explanation of potential impacts from the construction process to the marine and coastal environment. They should also provide an evaluation of marine historical or archaeological resources that could be disturbed, and plans to mitigate any potential impacts, or recover any resources that may be disturbed during construction.	**Proposed Project - Not applicable**. The proposed desalination plant would be located approximately 1.75 miles from the coast and would not impact marine or coastal resources during the construction phase, nor would any marine historical/archaeological resources be affected. **Alts. 1, 2, and 5a/5b – Not applicable.** Same as proposed project. **Alts 3 and 4 –** Desalination plant construction impacts on the marine and coastal environment and on marine historical and archaeological resources are evaluated for each alternative in Section 5.5. Marine Biological Resources, and 5.14 Cultural and Paleontological Resources, and impacts are noted above in consistency determinations regarding intake and discharge pipelines. None of the alternative locations for the desalination plants would affect marine or coastal resources, as they are sited inland.	• Description of the Proposed Project, Chapter 3. • Alternatives Analysis Section 5.5.15
All proposed projects should provide a stormwater pollution prevention plan (SWPPP). Stormwater runoff from the site should be managed to prevent any discharge of silt or chemical contaminants to the ocean or any other surface water body. The SWRCB General Construction Storm Water Permit for Construction Activities (General Permit) is required by the Central Coast Water Board for all construction activities that disturb at least one acre of soil, including grading and stockpiling. Local jurisdictions may require additional construction permits and SWPPPs at lower disturbance thresholds. In the case of any accidental spills or construction-related impacts on marine biological resources, MBNMS and NMFS management should be notified immediately and mitigation plans developed.	**Proposed Project - Consistent**. Construction of the proposed project would be conducted under a General Construction Permit, which is implemented and enforced by the Central Coast RWQCB and requires project operators to prepare a SWPPP. The proposed project would include a Hazardous Materials Business plan (HMBP) that is required by the Hazardous Materials Release Response Plans and Inventory Act of 1985 for businesses and construction contractors that use and store hazardous materials. The HMBP includes information on hazardous material handling and storage, including containment, site layout, and emergency response and notification procedures (including MBNMS and NMFS) in the event of a spill or release. **All Alternatives – Consistent**. Alternatives would be subject to the same requirements as the proposed project.	• Surface Water Hydrology and Water Quality, Section 4.3.5 • Hazards and Hazardous Materials, Section 4.7.5 • Alternatives Analysis Section 5.5.3 and 5.5.7

TABLE 6.4-1 (Continued)
ASSESSMENT OF PROJECT CONFORMITY WITH GUIDELINES FOR DESALINATION PLANTS IN MONTEREY BAY NATIONAL MARINE SANCTUARY

Summary of NOAA Desalination Guidelines	Summary of MPWSP Conformity with Guidelines	Section of EIR/EIS Containing Additional Information
Guidelines for Desalination Plant Construction Phase (Sec. D.3, pp. 10-12) (cont.)		
Best Management Practices should be developed and adhered to in order to avoid or minimize impacts on the marine environment during the construction phase of a desalination project. This should include the use of materials and practices that minimize disturbances to the environment to the maximum extent practicable.	**Proposed Project - Consistent**. All construction activities associated with the proposed project would occur several hundred feet inland of MHW and potential impacts on the marine environment within MBNMS would be less than significant, or no impact. **Alt. 1 – Consistent.** Same as the proposed project. **Alts. 2, 3, and 4 – Potentially Inconsistent.** Offshore construction would be required and disturbance to the marine environment would occur. **Alt. 5a/5b – Consistent.** Same as the proposed project.	• Surface Water Hydrology and Water Quality, Section 4.3.5 • Marine Biological Resources, Section 4.5.5 • Alternatives Analysis Section 5.5.3 and 5.5.5
The plant construction phase should include techniques and plans to avoid impacts on maritime heritage resources of the MBNMS. This includes submerged cultural and archeological resources including shipwrecks.	**Proposed Project - Consistent**. The proposed project would not be located near any MBNMS maritime heritage resources. The existing MRWPCA outfall would be used for the discharge of brine; no new construction activities would occur on the sea floor or in a MBNMS maritime heritage resource area. **Alt. 1 – Consistent.** Same as the proposed project. **Alts. 2, 3, and 4 – Consistent.** Although shipwrecks may be present in the offshore construction area, pre-construction marine surveys would be required to determine presence and to avoid such resources. **Alt. 5a/5b – Consistent.** Same as the proposed project.	• Description of the Proposed Project, Chapter 3 • Cultural and Paleontological Resources, Section 4.15.5 • Alternatives Analysis Section 5.5.15
Project proponents should adhere to specific conditions for all construction activities occurring on the beach. See bulleted list on page 11 of MBNMS Guidelines.	**Proposed Project - Consistent**. All construction activities associated with the proposed project would occur at a minimum of several feet inland of MHW; construction materials and equipment would be delivered by existing access roads, no fill material would be discharged into waters of MBNMS. A list of anticipated required permits and approvals is presented in Chapter 3. Many of these would include specific conditions for work on or near the beach. All project construction activities would comply with specific conditions of any and all authorizations, regardless of construction location. **Alt. 1 – Consistent.** Similar to the proposed project, but construction at Potrero Road may require specific conditions. **Alts. 2 and 3 – Not Applicable.** No beach construction. **Alt. 4 – Potentially Inconsistent.** Beach construction would be required for the intake pipeline and modification of the existing caisson. **Alt. 5a – Consistent.** Same as the proposed project. **Alt. 5b – Consistent.** Same as Alternative 1.	• Description of the Proposed Project, Chapter 3. • Surface Water Hydrology and Water Quality, Section 4.3.5

TABLE 6.4-1 (Continued)
ASSESSMENT OF PROJECT CONFORMITY WITH GUIDELINES FOR DESALINATION PLANTS IN MONTEREY BAY NATIONAL MARINE SANCTUARY

Summary of NOAA Desalination Guidelines	Summary of MPWSP Conformity with Guidelines	Section of EIR/EIS Containing Additional Information
Guidelines for Desalination Plant Construction Phase (Sec. D.3, pp. 10-12) (cont.)		
Mitigation should be provided for the loss of EFH from the placement of the intake structure, delivery pipeline, and outfall structure.	**Proposed Project - Not Applicable**. The marine biological resources study area for the proposed project does not include EFH and does not include the placement of any new structure in MBNMS. The proposed project would not affect EFH. **Alt. 1 – Potentially Inconsistent.** No feasible mitigation has been identified for indirect drawdown effects on Elkhorn Slough resources. **Alts. 2, 3, and 4 – Not Applicable.** The intake and outfall pipelines are not within EFH. **Alt. 5a – Consistent.** Same as the proposed project. **Alt. 5b –** Same as Alternative 1.	• Marine Biological Resources, Section 4.5, Figure 4.5-4 Essential Fish Habitat Designated in MBNMS under Federal Regulations • Alternatives Analysis Section 5.5.5
Monitoring (Sec. D.4, pp.12-13)		
The project proponent should develop an ongoing monitoring program to evaluate the extent of impacts from the plant's intake and discharge operations on marine biological resources. The monitoring program should focus on: a) developing a statistically acceptable baseline for the project area, b) monitoring source water for potential contaminants that may require additional treatment, c) monitoring the effluent prior to discharge to ensure it is in compliance with the California Ocean Plan d) monitoring the effects of the effluent on marine organisms within the plume, after the discharge begins, e) monitoring the impingement and entrainment effects on marine organisms, if applicable, and f) monitoring any required mitigation for unavoidable impacts to make sure the mitigation is performing as intended. The proposed monitoring system should be carried out for at least three years, with an evaluation report and cumulative impact evaluation generated each year. After the third year, the RWQCB and the MBNMS.	**Proposed Project - Consistent**. Mitigation Measure 4.3-4 (Operational Discharge Monitoring, Analysis, Reporting, and Compliance) applies to the proposed project operational discharges to ensure compliance with Ocean Plan requirements, and includes the following protocols, which are consistent with the guidelines: • To establish baseline conditions, continuously record water quality parameters of salinity and dissolved oxygen at one hour intervals at several locations in the receiving waters of the Monterey Bay for one year prior to commencement of operational discharges (consistent with a.). • Continue WQ monitoring for a minimum of five years once operational discharges have commenced to confirm compliance with Ocean Plan receiving water quality limitations. • Assess changes to the benthic community composition within the Zone of Initial Dilution (ZID) through the collection of visual observation data for the first 3 years with assessment to continue an additional 2 years (consistent with d.) • Prepare annual reports of analyses and summaries and send to RWQCB and MBNMS, and make publicly available via project website. Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives) would require CalAm to perform extensive water quality assessment prior to implementation of the proposed project as well as during operation of the facility to ensure compliance with MRWPCA NPDES Permit amendment process (Order No. R3-2014-0013, NPDES Permit No. CA0048551) and includes the following protocols:	• Surface Water Hydrology and Water Quality, Section 4.3.5 • Alternatives Analysis Section 5.5.3

TABLE 6.4-1 (Continued)
ASSESSMENT OF PROJECT CONFORMITY WITH GUIDELINES FOR DESALINATION PLANTS IN MONTEREY BAY NATIONAL MARINE SANCTUARY

Summary of NOAA Desalination Guidelines	Summary of MPWSP Conformity with Guidelines	Section of EIR/EIS Containing Additional Information
Monitoring (Sec. D.4, pp.12-13) (cont.)		
	• Quantify projected final design discharge volumes by month. • Collect samples of source waters and operational discharges and analyze for constituents listed in Table 1 of Ocean Plan. (Consistent with b. and c.) • Demonstrate compliance for the full range of regulated water quality constituents specified in the Ocean Plan and NPDES water quality requirements in the context of minimum initial dilution values at the edge of the ZID. • If results do not meet NPDES water quality requirements and Ocean Plan limitations, then MPWSP operational discharges shall not be released as proposed and would be subject to additional design features, engineering solutions, and/or operational measures to bring water quality constituents into conformance. • Additional design features and operational measures include additional pretreatment or source water, treatment of discharge, retrofitting the existing outfall to increase dilution, and flow augmentation. • The intakes would be subsurface; no impingement and entrainment effects would result. (Consistent with e.) Mitigation would be monitored in accordance with the Mitigation Monitoring and Reporting Program. (Consistent with f.) **All Alternatives – Consistent.** Monitoring programs would be required for any alternative approved by MBNMS, consistent with the provisions in this guideline.	

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CHAPTER 7
Report Preparation

7.1 Coordination and Consultations

Monterey Bay National Marine Sanctuary (MBNMS) has coordinated and consulted with several agencies during the National Environmental Policy Act (NEPA) process for the proposed project to meet the requirements of other federal laws. Summaries are provided below of the current status of consultations with the National Marine Fisheries Service (NMFS) under Section 7 of the Endangered Species Act (for marine species) and the Magnuson-Stevens Fishery Conservation and Management Act for Essential Fish Habitat (EFH); with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act (for terrestrial species); and with the State Historic Preservation Officer (SHPO) under Section 106 of the National Historic Preservation Act (NHPA). In addition, MBNMS has invited the U.S. Army (Presidio of Monterey) and the U.S. Army Corps of Engineers to be Cooperating Agencies under NEPA. See Appendix O, Agency Coordination and Consultation for documents related to consultation undertaken by MBNMS.

7.1.1 Endangered Species Act Section 7

Endangered Species Act Section 7(a)(1) directs federal agencies to use their authority to carry out programs for the conservation of threatened and endangered species. Federal agencies also must consult with NMFS under Section 7(a)(2) of the Act on activities that may affect a listed species (16 U.S.C. §1531 et seq.). These interagency Section 7 consultations are intended to assist federal agencies in fulfilling their duty to ensure that federal actions do not jeopardize the continued existence of a species or destroy or adversely modify critical habitat. In the event that NMFS determines that a proposed action would jeopardize a species or adversely modify critical habitat (81 Fed. Reg. 7214), it would suggest Reasonable and Prudent Alternatives to the proposed action.

For the proposed project, MBNMS is consulting with NMFS and USFWS as part of the Endangered Species Act Section 7 consultation process. MBNMS notified NMFS and USFWS regarding the proposed federal action in its August 26, 2015 Notice of Intent (NOI) to prepare an EIS for the proposed project (80 FR 51787, August 26, 2015) and is providing additional information about potential impacts of the proposed project addressed in this EIR/EIS. In June 2017, MBNMS prepared a Biological Assessment that provides specific information about potential impacts of the proposed project on federally listed species and designated critical habitat pursuant to the ESA, and on essential fish habitat (EFH) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§1801–1884). See Chapter 3, Project Description, Section 4.5, Marine Biological Resources and 4.6, Terrestrial Biological Resources.

On April 20, 2016, staff from USFWS, CDFW, MBNMS, AECOM (as a representative of CalAm, the applicant), and other consultants held a project coordination meeting.

On July 25, 2017, MBNMS sent an electronic request to USFWS to initiate consultation on the proposed project, including a copy of a Biological Assessment (BA) that describes the proposed action and evaluates the potential effects of the proposed project on listed and proposed species and designated and proposed critical habitat and makes a determination as to whether any such species or habitat are likely to be adversely affected by the project. On September 22, 2017, USFWS responded via letter with a request for additional information not found in the BA. Four more submittals were sent to USFWS responding to additional requests for information on October 13, November 13, and December 1, 2017, and February 20, 2018. MBNMS is awaiting a Biological Opinion from USFWS regarding the proposed project and its effects on subject listed species and designated critical habitats under Section 7(a)(2) of the Federal Endangered Species Act.

7.1.2 Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation

The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§1801–1884) establishes Essential Fish Habitat (EFH) provisions to identify and protect important habitats of federally managed marine and anadromous fish species. The Act defines EFH as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 U.S.C. §1802(10); 50 CFR 600.10). Federal agencies that fund, permit, or undertake activities that may adversely affect EFH are required to consult with NMFS regarding the potential effects of their actions on EFH, and respond to NMFS' recommendations (16 U.S.C. §1855). Federal agencies consult with NMFS under the Magnuson-Stevens Act as part of other existing interagency coordination processes to review proposed projects and other actions that may affect marine resource habitat.

On June 30, 2017, MBNMS sent an electronic request to NMFS to initiate consultation on the proposed project, including a copy of a Biological Assessment (BA) that describes the proposed action and evaluates the potential effects of the proposed project on EFH. Staff from NMFS, MBNMS, and their consultant had a conference call on August 9, 2017, to discuss proposed project components related to groundwater sources for the slant wells. The consultant provided additional information on August 30 and September 17, 2017, at which time NMFS determined the information was sufficient to initiate consultation. On October 23, 2017, NMFS issued a letter to MBNMS that determined the brine discharge resulting from the proposed action would adversely affect EFH by establishing mixing zones with salinity levels up to 2.0 ppt greater than ambient ocean conditions within 100 meters (328 feet) from the diffuser discharge area. However, various minimization measures to avoid or minimize impacts on federally managed fisheries will be employed. NMFS has no practical conservation recommendations to provide, in addition to what is already provided, that would further avoid or mitigate these impacts. NMFS concurred with MBNMS' conclusion that there would be no adverse effects for various life stages of fish species managed within the following Fishery Management Plans (FMP) under the Magnuson-Stevens Fishery Conservation and Management Act:

- Pacific Groundfish FMP;
- Coastal Pelagic Species FMP;
- Pacific Coast Salmon FMP, and;
- West Coast Fisheries for Highly Migratory Species FMP.

7.1.3 National Historic Preservation Act Section 106 Consultation

Federal agencies must demonstrate compliance with the National Historic Preservation Act (NHPA) (16 U.S.C. §470 et seq.). NHPA Section 106 requires a federal agency with jurisdiction over a project to take into account the effect of the proposed federal action on historic properties included on, or eligible for inclusion on, the National Register of Historic Places (16 U.S.C. §470f). Federal agencies also must provide the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking. Under NHPA Section 106, the MBNMS consults with Indian tribes as part of its responsibilities to identify, evaluate, and resolve adverse effects to historic properties affected by the Sanctuary's undertakings.

Implementation of the proposed project also requires local and state agencies to demonstrate compliance with the California Environmental Quality Act (CEQA), for which specific guidance regarding cultural resources is presented in Appendix K of the CEQA Guidelines. Local agencies may use the NHPA process to demonstrate compliance with those CEQA requirements. Analysis of impacts in this document and implementation of the mitigation measures in Section 4.15, Cultural and Paleontological Resources, provide evidence of MBNMS's compliance with Section 106 of the NHPA and NEPA as well as the California Public Utilities Commission's compliance with CEQA with respect to cultural resources. The basic steps in the Section 106 process are described in Section 4.15, Cultural and Paleontological Resources. For the proposed project, MBNMS contacted the Native American Heritage Commission (NAHC) and requested a search of the Sacred Lands File. The search identified no results, and the NAHC recommended MBNMS contact the tribes. MBNMS sent letters to those tribes on the provided contact list on June 24, 2016 (including members from the Esselen Tribe of Monterey County, Costanoan Rumsen Carmel Tribe, Ohlone/Costanoan Esselen Nation, Amah Mutsun Tribal Band, and Indian Canyon Mutsun Band). In response to the MBNMS letter, Irene Zwierlein from the Amah Mutsun Tribal Band of Mission San Juan Bautista requested additional information including whether a records search had been completed and the name of the consulting archaeologist. On behalf of MBNMS, Environmental Science Associates responded by email.

MBNMS completed follow up phone calls on March 16, 2017. MBNMS spoke with the Tribal Council Woman of the Ohlone/Costanoan Esselen Nation who requested that the letters and project location maps be resent. MBNMS also spoke with the Chairperson of the Amah Mutsun Tribal Band who was interested in project components north of the Salinas River.

Environmental Science Associates prepared a Cultural Resources Report that was included in a March 28, 2017 letter to the California State Historic Preservation Officer (SHPO) requesting concurrence on Section 106 compliance and a finding of "no adverse effect to historic properties" for the MPWSP. The request included a description of the project location, the project objectives and need, a project description, a description of the methodology employed for the identification of historic properties, a definition of the area of potential effect (APE), the results of the record searches, a description of the field surveys and Native American consultations that were conducted for the proposed project, as well as a determination of effects. In a letter dated May 3, 2017, following review by the Office of Historic Preservation staff, the SHPO found no objections to the APE as defined by MBNMS (pursuant to 36 CFR 800.4(a)(1)), found MBNMS has documented a reasonable and good faith effort to identify historic properties within the APE (pursuant to 36 CFR 800.4(b)), and pursuant to 36 CFR 800.5(b) concurred with MBNMS that the proposed undertaking will result in no adverse effect to historic properties.

7.1.4 Coastal Zone Management Act Federal Consistency Review

The federal consistency requirement set forth in Section 307 of the Coastal Zone Management Act (CZMA) requires that activities approved or funded by the federal government that affect any land or water use or natural resource of a state's coastal zone, must be consistent with the enforceable policies of the state's federally approved coastal management program.

Under Section 307 of the CZMA (16 U.S.C. §1456), activities that may affect coastal uses or resources that are undertaken by federal agencies, require a federal license or permit, or receive federal funding must be consistent with a State's federally approved coastal management program. California's federally approved coastal management program consists of the California Coastal Act, the McAteer-Petris Act, and the Suisun Marsh Protection Act. The California Coastal Commission implements the California Coastal Act and the federal consistency provisions of the CZMA for activities affecting coastal resources outside of San Francisco Bay. Subpart D of the federal consistency regulations governs consistency review for activities requiring a federal license or permit. This section requires the applicant to conduct any required consistency review with the state coastal commission, and provide the Federal permitting agency with a consistency certification.

The Coastal Commission considers an application for a coastal development permit to cover the requirement for an applicant submitting a consistency certification to the Coastal Commission if the activity is located in state waters. Typically, the Coastal Commission will provide its response (concurrence, conditional concurrence, or objection) in its staff report for the coastal development permit.

CalAm is currently in discussions with the California Coastal Commission. In addition, a preliminary assessment of project consistency with the enforceable policies of the California Coastal Commission's coastal management program is provided in some of the resource sections within Chapter 4 to facilitate the analysis of potential impacts in these resource areas. The California Coastal Commission will make the final decision as to whether the proposed project is fully consistent.

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