



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003



IN REPLY REFER TO:
08EVEN00-2014-I-0341

July 7, 2014

Paul Michel, Superintendent
National Oceanic and Atmospheric Administration
Monterey Bay National Marine Sanctuary
99 Pacific Street
Monterey, California 93940

Subject: Proposed Desalination Project, Temporary Slant Test Well, Marina, Monterey
County, California

Dear Mr. Michel:

We have reviewed your letter, dated September 24, 2013, and a clarifying electronic mail message from Bridget Hoover, of your staff, to Jacob Martin, of my staff, dated June 3, 2014, requesting our concurrence with your determination that your proposed authorization of construction and operation of a slant intake test well (test well) by California American Water (Cal-Am) on property owned by Cemex in Marina, Monterey County, California, may affect but is not likely to adversely affect the federally endangered Smith's blue butterfly (*Euphilotes enoptes smithi*), Monterey gilia (*Gilia tenuiflora* ssp. *arenaria*), or Menzies' wallflower (*Erysimum menziesii*); the federally threatened Monterey spineflower (*Chorizanthe pungens* var. *pungens*), or western snowy plover (*Charadrius nivosus nivosus*); or designated critical habitat for the Monterey spineflower or western snowy plover. The proposed project consists of construction, monitoring, and decommissioning of the test well. Your request is in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). The project is summarized here; more information is available in Cal-Am (2013), Zander Associates (2013), and SWCA Environmental Consultants (2014).

The proposed project includes the construction, pumping and monitoring, and eventual decommissioning of the test well. All activities would occur in disturbed habitat on property that includes on-going sand mining operations. The temporary slant well test facilities would include the slant well, submersible well pump, and well-head vault; vertical monitoring wells; test water disposal facilities; test water disposal connection to an existing outfall; electrical facilities; and temporary flow measurement/sampling equipment. The slant test well would be drilled towards the ocean at 19-degrees from horizontal such that a 1,000-linear-foot slant well would proceed to the bottom of the 180-foot aquifer formation. Water pumped from the test well would be discharged from the well head into a 12-16 inch diameter pipe that would be connected to a junction structure on an existing outfall pipeline seaward of the test well. Once the well is developed, it would be operated continuously using a submersible well pump for a period of up to 24 months. Operators would travel to the site using the existing Cemex access road on a weekly basis for 30 to 60 minutes per visit to check that the pump, meter, and water quality measurement equipment are operating properly, and to collect water quality samples. All construction and decommissioning activities would be

implemented from October 1 through February 28 (season of work), which would avoid the western snowy plover breeding season and Smith's blue butterfly flight season.

Monterey gilia and Menzies' wallflower are known to occur within the Cemex property, but 2013 botanical surveys of the area that would be affected during construction, operation, and decommissioning of the test well (action area) did not reveal these species (Zander Associates 2013). We therefore concur that these species are not likely to be adversely affected.

Monterey spineflower is known to occur within the action area including occurrences adjacent to, but not within, the existing access road (Zander Associates 2013). However, Cal-Am has committed to re-survey the action area for the species and to flag and avoid all previously and newly observed locations where the species occurs (Zander Associates 2013, RBF Consulting 2014). We therefore concur that this species is not likely to be adversely affected. The action area is outside of designated critical habitat for the Monterey spineflower (73 FR 1525); we therefore concur that this critical habitat is not likely to be adversely affected.

The Smith's blue butterfly is dependent upon its host plant species, seacliff buckwheat (*Eriogonum parvifolium*) and coast buckwheat (*Eriogonum latifolium*), during all life stages, except that adults may also feed on nectar from naked buckwheat (*Eriogonum nudum*).

The Smith's blue butterfly is known to occur within the Cemex property (Zander Associates 2013). Coast buckwheat plants have been observed near and to the north of the action area, but not within the action area (Zander Associates 2013). Due to the proposed season of work, pupae (which are the non-mobile over-wintering life stage of this species) are the only life stage likely to be present during construction and decommissioning. We expect that any pupae present will be closely associated with their host plants and therefore outside the action area. We therefore concur that this species is not likely to be adversely affected.

The Cemex property is occupied by the western snowy plover, including nesting and wintering individuals. The proposed season of work would avoid direct construction effects to eggs, chicks, and nesting activities. Most of the proposed construction would occur within the existing road and adjacent highly disturbed areas, which minimizes disturbance to western snowy plover habitat. The area of greatest concern would be on the upper beach, in relatively undisturbed habitat, where up to 100 feet of trench would be dug and an approximately 30-foot diameter hole would be excavated, which is required to connect the new discharge pipe to the existing buried outfall junction structure. There is a history of nesting activity in this area (Zander Associates 2013). However, we presume that this area was physically disturbed when the existing outfall was originally constructed and Cal-Am has proposed to recontour this area following the proposed construction under direction of staff from Point Blue Conservation Science (the local species experts who monitor western snowy plovers at the Cemex property). Disturbance of nesting habitat is of concern and some native vegetation would be lost during the proposed excavation (i.e., the disturbed sand would be recontoured back to a condition similar to that which it had pre-project, but it would take time for the habitat to fully recover its biological conditions).

Operator visits to the site would occur weekly year-round and have the potential to disturb nesting western snowy plovers. However, Cal-Am has proposed to retain a qualified biologist, who would

coordinate weekly with Point Blue Conservation Science and the operators to avoid disturbing nesting activities (Zander Associates 2013). If a western snowy plover nest is found in an area likely to be disturbed by operators visiting the test well, then the Service would be notified and the visits would be suspended (RBF Consulting 2014).

Due to the small area of nesting habitat that would be disturbed, the proposed recontouring to restore the physical conditions of that habitat, the seasonal avoidance of construction and decommissioning work during the nesting season, and the proposed measures to avoid disturbance of nesting individuals during operator visits to the test well; we concur that the western snowy plover is not likely to be adversely affected.

A small portion of the western (seaward) end of the action area is within designated critical habitat unit 22 for the western snowy plover (77 FR 36842). This area provides primary constituent element (PCE) 1 (areas that are below heavily vegetated areas or developed areas and above the daily high tides) (77 FR 36747) of critical habitat. This is the area that would be disturbed during connection to the existing outfall, as previously described. However, only a small amount of critical habitat would be physically disturbed, the proposed recontouring is expected to restore the physical conditions of the area, and we expect that the biological conditions of the area will recover over time. We conclude that, in this case, the effects to critical habitat would be so small and temporary as to be insignificant. We therefore concur that critical habitat for the western snowy plover is not likely to be adversely affected.

Conclusion

We concur with your determinations that Cal-Am's proposed construction, operation, and decommissioning of the test well may affect but are not likely to adversely affect the Smith's blue butterfly, Monterey gilia, Menzies' wallflower, Monterey spineflower, western snowy plover, or designated critical habitat for the Monterey spineflower or western snowy plover. This conclusion is based on Cal-Am's implementation of avoidance measures, the siting of work within existing disturbed areas, and the proposed season of work.

If circumstances arise indicating the proposed project may result in adverse effects to any federally protected species, project activities should be suspended and the Service should be contacted immediately to determine whether additional consultation is required. If you have any questions regarding this matter, please contact Jacob Martin of my staff at (831) 768-6953.

Sincerely,



Douglass M. Cooper
Deputy Assistant Field Supervisor

Literature Cited

[Cal-Am] California American Water. 2013. MPWSP temporary slant well project description. Unpublished report to the U.S. Fish and Wildlife Service. June 25, 2013. 11 pp.

RBF Consulting. 2014. Informal consultation summary; notes from a meeting on March 5, 2014. Unpublished report to the City of Marina. 2 pp. (Available in appendix B of SWCA Environmental Consultants (2014)).

SWCA Environmental Consultants. 2014. Draft initial study and mitigated negative declaration for the California American Water slant test well project. Unpublished report to the City of Marina. May 2014. 182 pp. plus appendices.

Zander Associates. 2013. Biological assessment for the MPWSP temporary slant well project, Marina, California. Unpublished report to the U.S. Fish and Wildlife Service. July 2013. 41 pp.

**BIOLOGICAL ASSESSMENT
FOR THE
MPWSP
TEMPORARY SLANT TEST WELL PROJECT
MARINA, CALIFORNIA**

Prepared by:

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Submitted to:

U.S. Army Corps of Engineers
San Francisco District
1455 Market Street
San Francisco, California 94103

On behalf of:

RBF Consulting
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July 2013

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1.0 INTRODUCTION

This biological assessment (BA) was prepared by Zander Associates to review the Temporary Slant Test Well Project (Project) proposed by California American Water (Cal Am). The temporary test well facility is being proposed to gather technical data related to feasibility of a subsurface intake system for a potential future desalination project. The data will be used, in part, to facilitate design and intake siting for the separately proposed Monterey Peninsula Water Supply Project (MPWSP).

The purpose of this BA is to review the Project in sufficient detail to determine to what extent it may affect federally threatened, endangered, candidate, proposed threatened or proposed endangered species, or critical habitat for these species. This BA was prepared in accordance with the legal requirements set forth under Section 7 of the Endangered Species Act (ESA) (16 U.S.C. 1536 (c)), and follows the standards established in the National Oceanic and Atmospheric Administration's (NOAA Fisheries) National Environmental Policy (NEPA) implementation procedures and Endangered Species Act (ESA) guidance. This BA accompanies a request for authorization submitted to the NOAA Office of Monterey Bay National Marine Sanctuary on June 25, 2013, for the Temporary Slant Test Well Project.

1.1 Project Overview

Cal Am proposes to construct and operate a temporary slant test well and associated monitoring wells and appurtenances to gather site-specific field data concerning geologic, hydrogeologic, and water quality characteristics of the Sand Dunes Aquifer, Salinas Valley Aquitard, and 180-foot Aquifer along the edge of Monterey Bay. The proposed Project would inform the planning, permitting, design, construction and operation of the separately proposed MPWSP. The Project would be constructed on lands owned by Cemex (APN 203-011-019-000) in a disturbed portion of the active mining area, east of the beach and adjacent to the unimproved roadway currently used by Cemex. (Figures 1 & 2).

1.2 Threatened or Endangered Species that May Be Affected

The federally threatened or endangered species listed below are known to occur nearby the project area. Other federally listed, candidate or proposed listed species with occurrence records in the general vicinity of the project area were considered for inclusion in this BA but were dismissed based on the habitat characteristics in the project area, location of project facilities, operational procedures and other factors. Many of the listed species eliminated from further consideration are marine organisms with offshore aquatic habitats that are not expected to be affected either directly or indirectly by construction and operation of the slant test well project. Other listed species eliminated from consideration rely on particular environments not found in the project area (e.g. California red-legged frog [*Rana draytonii*], Gowen cypress [*Cupressus goveniana*], Yadon's piperia [*Piperia yadonii*]). Some listed plants (beach layia [*Layia carnosa*], Tidestom's lupine [*Lupinus tidestromii*], coastal dunes milk vetch [*Astragalus tener* var. *titi*]) occur in coastal dune environments similar to those in the project area, but are only known from specific, relatively isolated locations in the Monterey Bay region and were also not considered further here.



Slant Test Well Location

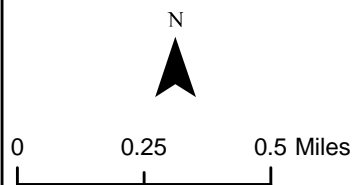
CEMEX

Marina Dunes Preserve

Legend

- Wellhead Vault
- Parcel Boundary

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 4460 Redwood Hwy, Suite 16-240
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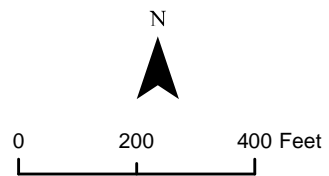


Site Location
 MPWSP
 Temporary Slant Test Well
 Marina, California

Figure 1



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Action Area
MPWSP
Temporary Slant Test Well
Marina, California

Figure
2

Smith's blue butterfly (*Euphilotes enoptes smithi*): The Smith's blue butterfly is federally listed as endangered. Smith's blue butterfly is found in a number of inland and coastal sand dunes, serpentine grasslands and cliffside chaparral plant communities along the central California coast. It is completely dependent upon coast and seacliff buckwheat (*Eriogonum latifolium* and *E. parvifolium*) during all life stages. During its one-year lifespan, mate location, copulation, oviposition and pupae emergence all occur on the flowerheads of the buckwheat species during peak flowering season, June through September. The dormant pupal form occurs during non-flowering periods.

Western snowy plover (*Charadrius nivosus nivosus*): The western snowy plover (formerly *Charadrius alexandrinus nivosus*) is federally listed as threatened and is designated a Species of Special Concern by the California Department of Fish and Wildlife (CDFW). It is a shorebird distinguished from other plovers (family Charadriidae) by its small size, pale brown upper parts, dark patches on either side of the upper breast, and dark gray to blackish legs. Nesting sites for western snowy plovers are found along beaches and adjacent bare dunes of the Pacific coast from Washington to Baja California. The species also occurs along the shores of salt ponds and alkali or brackish inland lakes. Monterey Bay as a whole is considered one of eight primary coastal nesting areas.

Yadon's wallflower (*Erysimum menziesii* ssp. *yadonii*): Yadon's wallflower is federally listed and state listed as endangered. It is restricted to four populations in the vicinity of the Marina Dunes near the Salinas River in Monterey County. It is found in coastal dunes, mostly on the seaward edge of stabilized foredunes, growing in more saline sites than other subspecies of *E. menziesii*. Yadon's wallflower was likely more abundant along the coastal bluffs of Marina at one time, but the colonies "migrate" considerably due to storm and bluff erosion (Thomas Reid Associates, 1997). It thrives in open areas free of other plant competition and tolerates moderate sand burial.

Monterey gilia (*Gilia tenuiflora* ssp. *arenaria*): Monterey gilia (also commonly referred to as sand gilia) is federally listed as endangered and state listed as threatened. It is a small, erect annual plant in the phlox family (Polemoniaceae) that is endemic to the Monterey Bay area. Along the coast, Monterey gilia is found on rear dunes, near the dune summit in level areas, and on depressions or slopes in wind-sheltered openings in low-growing dune scrub vegetation. It does not occur in areas exposed to strong winds and salt spray. Monterey gilia is distributed in discontinuous populations and its range extends from Spanish Bay on the Monterey Peninsula north to Sunset Beach State Park in Santa Cruz County.

Monterey spineflower (*Chorizanthe pungens* var. *pungens*): Monterey spineflower is a prostrate annual herb in the buckwheat family (Polygonaceae). It is federally listed as threatened but is not listed by the State of California. Monterey spineflower occurs along the coast of southern Santa Cruz and northern Monterey Counties and inland to the coastal plain of the Salinas Valley. It flowers from April through June and is likely self-pollinated in addition to being insect pollinated. It produces small seeds that are dropped or shaken by wind from their capsule and may then be dispersed with blowing sand or by fur-bearing animals to which the spiny fruits may attach and be carried. The species colonizes open sandy sites and tends to

invade roadsides and firebreaks. It is found in maritime chaparral, coastal live oak woodland, coastal scrub, grassland, and coastal dune habitats.

1.3 Critical Habitat

Critical habitat is defined as specific areas that have been found to be essential to the conservation of a federally listed species, and which may require special management considerations or protections. Critical habitat is determined using the best scientific and commercial information available and taking the physical and biological (primary constituent elements [PCEs]) needs of the species into consideration. The action area addressed in this BA is within designated critical habitat for the Monterey spineflower (USFWS 2008a), and a small portion at the west end of the action area is within designated critical habitat for the Pacific Coast distinct population segment (DPS) of the western snowy plover (Pacific Coast WSP) (USFWS 2012a). The action area is not within critical habitat for any other federally-listed species for which critical habitat has been designated.

2.0 CONSULTATION TO DATE

On behalf of Cal Am, RBF Consulting (RBF) evaluated numerous alternative temporary slant test well sites during the summer and fall of 2012. Zander Associates biologists reviewed several of those alternatives and initiated contact with state and federal resource agencies to solicit their comments beginning in July 2012. An initial meeting with representatives of the U.S. Fish and Wildlife Service (USFWS), Monterey Bay National Marine Sanctuary (MBNMS), California Department of Fish and Wildlife (CDFW, formerly California Department of Fish and Game, CDFG), PRBO Conservation Science (now known as Point Blue Conservation Science and hereinafter referred to as Point Blue), Cal Am, RBF and Zander Associates was held at RBF offices in Marina on September 20, 2012. At that meeting, RBF presented plans for a proposed test well site on the beach toward the north end of the Cemex property as the preferred project alternative. The proposed location of the slant test well project relative to western snowy plover use of that area of beach was identified as the most critical issue for USFWS. Avoidance of impacts to other special status plant and animal species associated with the coastal dune environment, using horizontal directional drilling techniques and other methods for installing pipelines and infrastructure, was considered potentially feasible by the resource agencies. However, the agencies encouraged Cal Am to seek an alternative location in previously disturbed areas south of the Cemex property to avoid potential impacts to plovers.

A second meeting was held at the RBF Marina offices on November 1, 2012 to review issues limiting the choice of alternative locations and to discuss a modified version of the preferred project. USFWS maintained its position that an alternative location would be preferable and that heavy equipment impacts to potential nesting areas on sandy substrates were sufficiently unknown to warrant caution at the preferred location. According to USFWS and Point Blue, sand disturbance and compaction from use of heavy equipment and vehicles could have negative consequences on plover breeding behavior, even if work occurred outside of the breeding season as proposed.

As a result of the second agency meeting, Cal Am and RBF developed another alternative plan with specific avoidance and minimization measures intended to avoid impacts to sandy substrates that could serve as nesting habitat for plovers. Zander Associates forwarded preliminary exhibits for this alternative plan to USFWS and Point Blue in late November 2012. Follow up contact (email exchange and brief telephone discussions) with both USFWS and Point Blue occurred in December 2012, February 2013 and March 2013. In April 2013, a Biological Assessment (BA) was completed for that alternative plan.

Additional contact between Cal Am and various agency representatives occurred between April and June 2013 to further explore alternative test well sites. An all-hands agency meeting was held on June 10, 2013, to review a new siting option for the slant test well and associated monitoring wells and appurtenances located entirely within previously disturbed areas on the Cemex property. The alternative plan developed as a result of that meeting is the subject of this BA.

3.0 DESCRIPTION OF THE PROPOSED ACTION

The temporary slant test well and related facilities would be located in a disturbed portion of the active Cemex mining area (APN 203-011-019-000), east of the beach, on and adjacent to the unimproved roadway currently used by Cemex (Figure 2). The temporary slant well test facilities would include the slant well, submersible well pump, and well-head vault; vertical monitoring wells; test water disposal facilities; test water disposal connection to an existing outfall; electrical facilities; and temporary flow measurement/sampling equipment (Figure 3). The Project does not include any reverse osmosis (RO), treatment, brine discharge, or conveyance infrastructure.

To minimize potential impacts on western snowy plover nesting habitat, the temporary slant test well and all associated facilities would be located within the previously disturbed Cemex access road area (Figure 4). All construction and demobilization activities would occur in the plover's non-breeding season (October 1st through February 28th).

3.1 Access

Access to the temporary well facility would be obtained by vehicles transporting personnel, construction equipment and construction materials to and from the site by using the existing established route through the Cemex operations area.

3.2 Restricted Construction Area

All construction activities would be restricted to a proposed construction area and access route. All construction activities would be in non-native or disturbed areas on or adjacent to the active Cemex access road. No construction equipment, materials, or activity would occur outside the specified areas.

3.3 Project Facilities

An overview of the layout of the proposed test well facilities is shown on Figure 3. A more detailed view of the test well facilities at the well-head is shown on Figure 4. The exact location

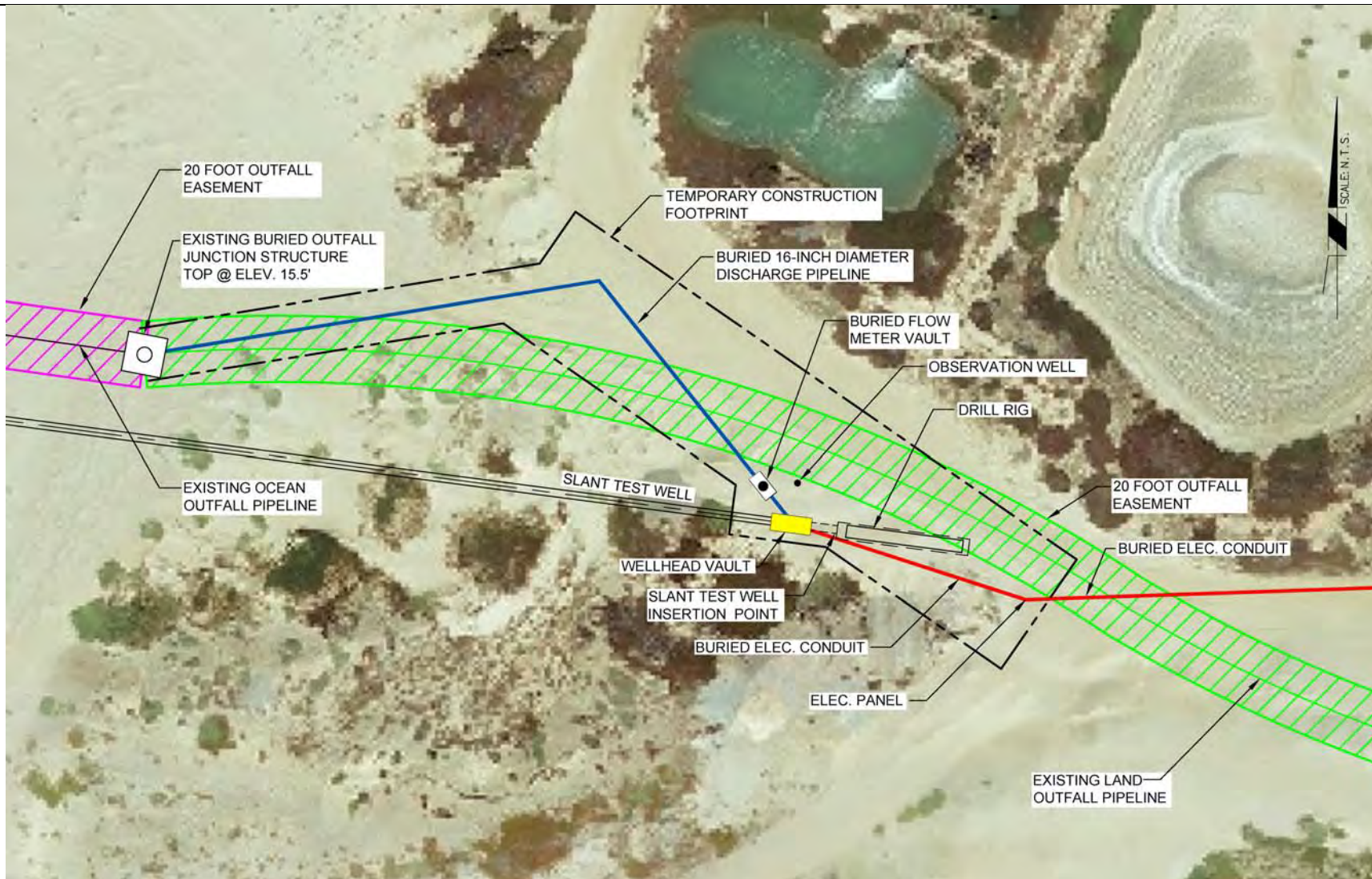


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Test Well Facilities
 MPWSP
 Temporary Slant Test Well
 Marina, California

Figure
 3



Zander Associates
 Environmental Consultants
 4460 Redwood Hwy, Suite 16-240
 San Rafael, CA 94903

N

 Source: RBF Consulting

Slant Test Well Site Schematic
 MPWSP
 Temporary Slant Test Well
 Marina, California

Figure
 4

of the test well facilities would be determined immediately prior to construction, based on field conditions at that time.

3.3.1 Temporary Slant Test Well and Well-head Facilities

The temporary slant test well would be designed using similar materials, size and construction methodology as the proposed intake wells for the MPWSP. The slant test well would be drilled towards the ocean at 19-degrees from horizontal such that a 1,000 linear foot slant well would proceed to the bottom of the 180-foot aquifer formation. The slant test well would be completed using up to 22-inch diameter casing and up to 12-inch diameter screen of “Super Duplex” stainless steel, a specialty metal designed for use in seawater environments. Well screen would be installed starting at elevation 30 feet below mean sea level (BMSL) through both the Dune Sands Aquifer and the 180-Foot Aquifers.

3.3.2 Monitoring Wells

Two individual vertical monitoring wells would be drilled prior to drilling the slant test well in order to provide confirmation of geologic conditions. One of the monitoring wells would be in the immediate vicinity of the slant test well and the second monitoring well would be approximately 1,200 feet inland on the side of the Cemex access road. The wells would be two-inch diameter wells, with one being drilled to a depth of approximately 300 feet BMSL, and the other to approximately 400 feet BMSL. Boreholes for the monitoring wells would be approximately six inches in diameter, and would be drilled using a sonic drilling method. The monitoring wells would be constructed with a filter pack and surface seal in accordance with both County of Monterey and State of California well standards for monitoring wells.

3.3.3 Electrical Power Supply

Electrical power for construction and pumping operations would be provided by a connection to either Cemex or a new connection to PG&E at the Cemex site. A buried conduit, approximately four inches in diameter would run about 2,000 linear feet from an existing transformer at the Cemex administrative buildings out to the test well, generally following the alignment of the existing Cemex access road. The eastern third of the alignment would most likely be installed using trenchless technology (either horizontal directional drilling (HDD) or drill-and-burst), but the western portion would be installed in a trench about 12 inches wide and 3 feet deep that would be backfilled as the conduit is installed. The conduit would terminate at an above ground electrical panel to be installed near the well-head that would be about 5 feet high, 4 feet wide, and 30 inches deep.

3.3.4 Test Water Disposal Facilities

Water pumped from the test well would be discharged from the well head into a 12-16 inch diameter pipe that would be connected to a junction structure on an existing outfall pipeline seaward of the test well. The discharge pipe would be approximately 180 linear feet. It would follow the alignment generally shown on Figure 4 and is intended to be on disturbed ground as much as possible. The pipe would be installed in a trench and buried 3 to 6 feet under the sand. The top of the junction structure is approximately 6 feet under the existing ground elevation and would need to be exposed in order to make the connection. Consequently, a cone shaped

excavation approximately 6 feet deep and 20 to 30 feet in diameter at the ground surface would be needed to connect the pipe to the junction structure.

3.4 Project Phasing and Scheduling

The temporary slant test well program would be implemented in a Construction/Initial Testing Phase, followed by a Monitoring Phase. The Construction/ Initial Testing Phase would consist of drilling monitoring wells, drilling and developing the test slant well, connecting the discharge pipe to the existing outfall, and performing short-term pumping tests within the five month non-nesting season (for the snowy plover) from October 1, 2013 through February 28, 2014.

Construction equipment would be mobilized on October 1 assuming all permits are secured. Site preparation, drilling and development of the slant test well would be performed around the clock.

Once the well is developed, it would be operated continuously using a submersible well pump for a period of up to 24 months. Operators would travel to the site using the existing Cemex access road on a weekly basis for 30 to 60 minutes per visit to check that the pump, meter, and water quality measurement equipment are operating properly, and to collect water quality samples.

4.0 DESCRIPTION OF THE ACTION AREA

The “action area” is defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action” (50 CFR 8402.02).

4.1 Location and General Characteristics

The action area considered for this BA is an approximately 12.6-acre portion of the Cemex Lapis Sand Plant property (APN 203-011-019-000) (Figure 2). It includes all areas that would be directly affected by the project and extends approximately 100 feet out from those areas. The action area is comprised of developed industrial facilities and disturbed, formerly mined coastal sand dunes.

4.2 Cemex Operations Area

The operations area at the Cemex Lapis Sand Plant includes administrative buildings, sand processing facilities and areas of disturbed dune characterized by beach sands and Aeolian sand dunes of the Flandrian complex overlying Pre-Flandrian dune deposits. The area covers about 104 acres and is the subject of an approved Reclamation Plan (CA Mine ID #91-27-0006).

The temporary slant test well project will use existing Cemex access roads from the eastern Cemex site entrance all the way to the slant test well facility. Disturbed areas immediately adjacent to the main east-west access road would be used for installation of the electrical conduit and the test water discharge pipe. For the purposes of this BA, the action area extends approximately 100 feet on either side of the centerline of the roads and 100 feet out from the outfall junction structure towards the beach.

The road from the site entrance to the vicinity of the Cemex facility is paved and passes through operational areas on either side as described above. No dune habitat (or any native habitat, disturbed or otherwise) occurs in this area based on observations during site reconnaissance visits on September 20, 2012, March 5, 2013 and April 25, 2013. From the Cemex facility westerly to the beach entrance, the road consists of unvegetated, compacted sand with disturbed dunes on either side (Photo 1).¹ The redwood lined flume parallels the road on the north and carries process water to settling ponds near the beach end of the road (Photo 2). The ponds appear to be periodically maintained by removing accumulated sediment which is stockpiled alongside the road. Other stockpiles of sandy material and previously scraped areas characterize both sides of this section of road along its length (Photo 3). During the March 5th and April 25th site visits, no undisturbed dune habitat was observed within 100 feet of either side of the unpaved road. In the few vegetated areas observed, iceplant (*Carpobrotus* spp.), was dominant, but occasional occurrences of native plants such as beach sagewort (*Artemisia pycnocephala*), mock heather (*Ericameria ericoides*), sand verbena (*Abronia* sp.), beach knotweed (*Polygonum paronychia*), and beach evening primrose (*Camissonia cheiranthifolia*) were observed. During the April 25th plant surveys, Monterey spineflower (*Chorizanthe pungens* var. *pungens*) was found in bare sand areas within the action area and in some cases extended up to the edge of the road, but was not found within the active roadbed. Individuals of coast buckwheat (*Eriogonum latifolium*), a host plant for the Smith's blue butterfly, were also encountered within the action area, especially on the northerly side of the flume adjacent to the road (see below).



Photo 1: Access road through Cemex facility looking west

¹ A railroad spur formerly ran along the south side of this road out to the beach, but has since been removed.



Photo 2: Flume parallel to access road through Cemex facility looking east



Photo 3: Stockpiles along both sides of Cemex facility access road

4.3 Slant Test Well

The temporary slant test well facilities would be located near where the existing Cemex access road ends at the beach, approximately 450 feet from the shoreline (Figures 2 & 4; Photo 4). The Cemex extraction pond is located just northerly of the termination of the road. The existing buried outfall junction structure is at the westernmost end of the action area, within bare sand at the top of the beach (Photo 5). Equipment associated with the Cemex operations appears to use the area occasionally for access to dredge anchors around the perimeter of the extraction pond. The sand in this area also appears frequently contoured by the wind and is virtually devoid of



Photo 4: West end of Cemex access road in approximate vicinity of test well



Photo 5: Vehicle tracks in the sand near existing manhole at the end of the Cemex access road.

vegetation. However, successful nests and nesting attempts by western snowy plovers have been recorded by Point Blue in this area (see below).

The test well would be located about 160 feet east (inland) of the outfall junction structure. Again, all facilities would be constructed in previously disturbed areas. Although there are historical records of western snowy plovers nests in this area, no nesting attempts have been observed here for several years.

5.0 SPECIES ACCOUNTS AND STATUS IN THE ACTION AREA

5.1 Smith's Blue Butterfly

5.1.1 Status and Description

The Smith's blue butterfly was listed by USFWS as endangered on June 1, 1976 (41 FR 22041). Critical habitat for Smith's blue butterfly was proposed in 1977 (42 FR 7972), but to date there has been no final designation.

When it was listed in 1976 Smith's blue butterfly was known primarily from remnant, partially stabilized sand dunes around Monterey Bay. Since it was listed additional colonies have been discovered in other locations and habitat types. The species recovery plan approved by USFWS in 1984 indicates that the discovery of these additional colonies may warrant reclassification of the species. In the five-year review document for Smith's blue butterfly, published in September 2006, USFWS recommends that the species be downlisted from endangered to threatened due to an expansion of the subspecies known range from the time of listing, largely within the southern part of its range. However, USFWS remains concerned about extirpation of the species from parts of its northern range due to habitat fragmentation from residential and industrial development, isolation from the species' larger southern populations, and habitat degradation from invasive non-native plants and industrial and recreational use.

The Smith's blue butterfly is relatively small, slightly less than one inch (2.5 cm) across with wings fully spread. The undersides are whitish-gray, speckled with black dots, and have a band of red-orange marks across the hind wings. Sexual differences are seen on the upper wing surface. Males are bright lustrous blue, whereas females are brown above with a band of red-orange marks across the hind-wings. Above, both sexes have prominently checkered fringes on both fore-wings and hind-wings, while males have wide black borders, and a very hairy appearance of the body and adjacent wings (USFWS 1984). The Smith's blue butterfly is separated from other subspecies of *E. enoptes* by the light undersurface ground color with prominent overlying black markings together with a faint black terminal line.

5.1.2 Distribution and Habitat

In Monterey County, Smith's blue butterfly is found on coastal sand dunes in association with both coast buckwheat and seacliff buckwheat. Coast buckwheat is often predominant in the dunes of the northern part of the range, while there are several sand-dune inhabiting populations that occur in association with seacliff buckwheat from the southern portion of Fort Ord to Monterey. South of Monterey, into northern San Luis Obispo County, at least as far as San Carpoforo Creek, Smith's blue butterfly is found at several dozen locations in the Santa Lucia Mountains and along the immediate coastline, where there are coastal sage scrub or chaparral habitats and *E. parvifolium*. Similarly, inland populations of the butterfly, such as those occurring in the Carmel River Valley, are primarily associated with coastal sage scrub and chaparral habitats, and feed on *E. parvifolium*. At some interior locations, adults of the Smith's

blue have also been observed nectaring on naked buckwheat (*E. nudum*), but it is not known if larvae feed on this buckwheat (Arnold 1991).

5.1.3 Life History

Smith's blue butterfly is univoltine, i.e., it has only one generation per year. Adult emergence and seasonal activity is synchronized with the blooming period of the particular buckwheat used at a given site. At a particular location, adults are active for about four to eight weeks, but the adult activity period and duration can vary dramatically from year-to-year and from one location to another. Individual adult males and females live approximately one week, and both sexes spend the majority of their time on *Eriogonum* flowerheads (USFWS 2006). There they perch, bask (i.e., thermoregulate), forage for nectar, search for mates, copulate, and lay their eggs. Females lay single eggs on the buckwheat flowers. Larvae hatch in about one week and begin feeding in the buckwheat flowerheads. Young larvae feed on the pollen and developing flower parts, while older larvae feed on the seed s. Older larvae are tended by ants, which may provide some protection from parasites and predators. Upon maturing in about one month, the larvae pupate in the flowerheads or in the leaf litter and sand at the base of the buckwheat plant. Pupae that form in the flowerheads later drop to the ground. Dispersal data from capture-recapture studies (USFWS 2006) indicate that most adults are quite sedentary, with home ranges no more than a few acres. However, a small percentage of adults disperse farther and exhibited home ranges between 20-30 acres (USFWS 2006).

Not all of the buckwheat host plants within the range of the Smith's blue are used by the butterfly at any given point in time. Butterflies that feed on *Eriogonum* flowers favor mature, robust individuals of the perennial buckwheats because they produce more flowers (USFWS 2006). Thus, buckwheat stands that consist of younger or older, senescent individuals, which produce fewer flowers, may not be visited by the butterfly until these plants mature or are augmented by robust, flowering specimens. Among butterflies, it is somewhat unusual for both the adult and larval stages to feed only on one plant, and, in particular, only on just the flowers. Most butterflies feed as caterpillars on one or a few closely-related plants, and then as adults obtain nectar from flowers that are generally unrelated to what the caterpillars fed on. Because of the Smith's blue's dual dependency on the flowers of its buckwheat foodplants, it is more susceptible to habitat degradation. Although it is more extinction prone because of its total dependence upon the flowers of buckwheats, conservation efforts are greatly simplified because resource managers only need worry about a single plant rather than several plants to maintain this endangered butterfly.

5.1.4 Threats to Survival

The decline of Smith's blue butterfly across its range is attributed to degradation and loss of habitat as a result of urban development, recreational activities, sand mining, military activities, fire suppression, and encroachment of invasive non-native plants. All of these threats, except military activities are ongoing within occupied Smith's blue butterfly habitat.

5.1.5 Occurrence within the Action Area

The California natural diversity data base (CDFW 2013) has a relatively large element occurrence (EO 15) of Smith's blue butterfly mapped on the Cemex property; the southern tip of

the EO 15 polygon is traversed by the east-west access road segment of the action area. This occurrence represents the extent of available habitat identified during surveys conducted in 1985 and 1986 for the Marina Dunes Plan under the aegis of the Marina Dunes Coastal Zone Planning Task Force (Thomas Reid Associates 1997). These surveys and additional surveys conducted in 1996 & 1997 by Thomas Reid Associates indicate that the area is occupied by Smith's blue butterfly, but the amount of available habitat was not quantified (USFWS 2006).

Environmental Science Associates (ESA) conducted field surveys on the Cemex property in May and June 2012 and assumed that Smith's blue butterfly habitat occurred throughout their study area because of high densities of coast buckwheat (ESA 2012). Although most of the dune portions of their study area did not overlap with those of the action area considered in this BA, the conclusion that Smith's blue butterfly could potentially occur on any coast buckwheat plants in the area also applies to the action area.

During field visits by a Zander Associates biologist on September 20, 2012, and March 5, 2013, numerous individual coast buckwheat plants were observed along the east-west access road through the Cemex facility. The plants were mostly limited to the slopes adjacent to the return water flume parallel to and north of the road, but were also seen on remnant dune substrates to the north of the flume (Photo 6). No buckwheat plants were observed within the action area south of the road but several were seen in less disturbed areas several hundred feet south of the action area boundary. During the April 25, 2013 survey, Zander Associates biologists again observed coast buckwheat plants, primarily on the north side of the road and no closer than about 15 feet from the road's edge. Because of ongoing use, disturbance and compaction, coast buckwheat is not expected to colonize the roadway or the areas immediately adjacent to it.



Photo 6: Coast buckwheat plants among iceplant mats on north side slope of flume

5.2 Western Snowy Plover

5.2.1 Status and Description

The Pacific Coast western snowy plover was listed by USFWS as threatened on March 5, 1993 (58 FR 12864). A final Recovery Plan for the species was issued in 2007 (USFWS 2007). In December of 1999, the USFWS designated critical habitat for the species, including 28 areas along the coast of California, Oregon, and Washington (64 FR 68508). That rule was remanded and partially vacated by the U. S. District Court for the District of Oregon on July 2, 2003, in order to conduct a new analysis of economic impacts (Coos County Board of County Commissioners et al. v. Department of the Interior et al., CV 02–6128, M. Hogan). A revised rule designating critical habitat was published on September 29, 2005 (70 FR 56970). As part of a settlement agreement, USFWS agreed to reconsider the designations and a final revised critical habitat was published in the Federal Register on June 19, 2012 (77 FR 36727).

The western snowy plover is a small shorebird in the family Charadriidae. It weighs from 34 to 58 grams (1.2 to 2 ounces) and ranges in length from 15 to 17 centimeters (5.9 to 6.6 inches) (USFWS 2007). It is pale gray-brown above and white below, with a white hindneck collar and dark lateral breast patches, forehead bar, and eye patches. The bill and legs are blackish. In breeding plumage, males usually have black markings on the head and breast; in females, usually one or more of these markings are dark brown. Early in the breeding season a rufous crown may be evident on breeding males, but it is not typically seen on females. In non-breeding plumage, sexes cannot be distinguished because the breeding markings disappear. Fledged juveniles have buffy edges on their upper parts and can be distinguished from adults until approximately July through October, depending on when in the nesting season they hatched. After this period, molt and feather wear makes fledged juveniles indistinguishable from adults. Individual birds one year or older are considered to be breeding adults. The mean annual life span of western snowy plovers is estimated at about three years, but at least one individual was at least 15 years old when last seen (USFWS 2007).

5.2.2 Distribution and Habitat

The Pacific coast population of the western snowy plover breeds primarily on coastal beaches from southern Washington to southern Baja California, Mexico. Sand spits, dune-backed beaches, beaches at creek and river mouths, and salt pans at lagoons and estuaries are the main coastal habitats for nesting (USFWS, 2007). This habitat is unstable because of unconsolidated soils, high winds, storms, wave action, and colonization by plants. Less common nesting habitats include bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and river bars (USFWS 2007).

Western snowy plovers concentrate in suitable habitat, with the number of adults at coastal breeding locations ranging from one to over 300, depending in part, on the size of the area. Nesting sites for western snowy plovers are found along beaches and adjacent bare dunes of the Pacific coast from Washington to Baja California. The species also occurs along the shores of salt ponds and alkali or brackish inland lakes. Monterey Bay as a whole is considered one of eight primary coastal nesting areas.

Breeding and nesting occurs mid-March through mid-September and nests are found above the high tide level on sandy, open ground where both the male and female incubate the eggs. In winter, western snowy plovers are found on many of the beaches used for nesting as well as on beaches where they do not nest, in man-made salt ponds, and on estuarine sand and mud flats. Western snowy plovers are highly sensitive to human disturbance and may abandon their nests if disturbed.

5.2.3 Life History

Nesting western snowy plovers at coastal locations consist of both year-round residents and migrants. Migrants begin arriving in central California as early as January, although the main arrival is from early March to late April (USFWS 2007). Since some individuals nest at multiple locations during the same year, birds may continue arriving through June. Western snowy plovers are monogamous by clutch and can have multiple clutches per year with typically three (but sometimes two) eggs per clutch. Females may lay up to six clutches per year. The young are precocial and will leave the nest within hours of hatching in search of food. They are not able to fly for about one month after hatching; fledging requires 28-33 days. Broods of chicks may remain in the nesting area until fledging or may travel along the beach as far as 6.4 kilometers (four miles) from their natural area (USFWS 2007).

Nests typically occur in flat, open areas with sandy or saline substrates; vegetation and driftwood are usually sparse or absent (USFWS 2007). Nests consist of a shallow scrape or depression, sometimes lined with beach debris (e.g., small pebbles, shell fragments, plant debris, and mud chips); nest lining increases as incubation progresses. Driftwood, kelp, and dune plants provide cover for chicks that crouch near objects to hide from predators. Invertebrates are often found near debris, so driftwood and kelp are also important for harboring western snowy plover food sources. Nests are usually within 100 meters (328 feet) of water, but could be several hundred meters away if there is no vegetative barrier between the nest and water. It is believed that the absence of such a barrier is probably important for newly-hatched chicks to have access to the shore (USFWS 2007).

Adult western snowy plovers do not feed their chicks, but lead them to suitable feeding areas. Adults use distraction displays to lure predators and people away from chicks. With vocalizations, adult western snowy plovers signal the chicks to crouch as another way to protect them. They also may lead chicks, especially larger ones, away from predators (USFWS 2007). Young chicks must be brooded frequently by an adult to maintain homeostasis. Females generally desert mates and broods by the sixth day after hatching and thereafter the chicks are typically accompanied by only the male. While males rear broods, females obtain new mates and initiate new nests (Page et al. 1995). Females typically help rear the last brood of the season.

Western snowy plovers are primarily visual foragers, using the run-stop-peck method of feeding typical of *Charadrius* species. They forage on invertebrates in the wet sand and amongst surf-cast kelp within the intertidal zone, in dry sand areas above the high tide, on salt pans, on spoil sites, and along the edges of salt marshes, salt ponds, and lagoons. They sometimes probe for prey in the sand and pick insects from low-growing plants.

While some western snowy plovers remain in their coastal breeding areas year round, others migrate south or north for winter. In Monterey Bay, 41 percent of nesting males and 24 percent of the females were consistent year-round residents. The migrants vacate California coastal nesting areas primarily from late June to late October (USFWS 2007).

In winter, western snowy plovers are found on many of the beaches used for nesting, as well as some beaches where they do not nest. Also occurring in these areas are snowy plovers that breed in the interior but migrate to the coast for winter. Plovers from both interior and coastal breeding populations also occur in man-made salt ponds and on estuarine sand and mud flats. In California, most wintering western snowy plovers concentrate on sand spits and dune-backed beaches. Some also occur on urban and bluff-backed beaches, which are rarely used for nesting (USFWS 2007). Plovers are typically gregarious in winter, usually roosting and foraging in loose flocks. Wintering plovers usually roost in small depressions in the sand or in the lee of kelp, other debris or small dunes which provide some shelter from wind and cover from predators. When disturbed, winter roosting plovers may run a few meters to a new spot, displacing other individuals, or the whole flock may fly to a new location.

5.2.4 Threats to Survival

Human disturbance has been identified as a factor that may limit or prohibit the use of beaches by nesting snowy plovers (USFWS 2007). Pedestrians may cause plovers to flush from potential nesting areas, trample nest scrapes, eggs, or chicks, and force broods to move into unsuitable areas. High rates of disturbance may cause eventual abandonment of breeding sites (Lafferty 2001), although with significant habitat protections and enforcement, plovers can nest successfully at beaches with high levels of recreation (Lafferty et al. 2006). Predators of snowy plovers such as the merlin (*Falco columbarius*) or peregrine falcon (*Falco peregrinus*) also disturb plovers when they are hunting in the wintering and breeding areas.

5.2.5 Occurrence within the Action Area

The shoreline along the Cemex property lies within designated critical habitat for the Pacific Coast distinct population segment (DPS) of the western snowy plover and is within Recovery Unit 4 - Sonoma to Monterey Counties, California – as described in the Western Snowy Plover Recovery Plan (USFWS 2007). A small portion at the western end of the action area, where the discharge pipeline would be connected to the existing outfall junction structure, is within the limits of designated critical habitat. Each recovery unit includes specific locations and in some cases subareas that are identified as important for the recovery of the plover. The Cemex shoreline lies within the Moss Landing to Monterey specific location (CA-65) and the "Lonestar Beach and interior areas" subarea (USFWS 2007). According to the Recovery Plan (Appendix B), the management potential for plovers in CA-65 (162 breeding adults) is the highest in Recovery Unit 4 and the Lonestar (now Cemex) Beach subarea management potential (32 breeding birds) is second only to the Salinas River National Wildlife Refuge (NWR) within CA-65.

The beach adjacent to the action area has been identified as both important nesting and wintering habitat for the plover as a result of nearly 30 years of monitoring. Point Blue has intensively

monitored the productivity and population size of snowy plovers within this area during the breeding season (March 1-Sept 30) since 1984. During the non-breeding season, at least one annual “winter window” survey of the area has been conducted since the winter of 2003-2004. In addition, incidental winter surveys at known flock areas have been conducted opportunistically to monitor survival rates of color-banded plovers. Because roosting flocks of wintering birds persist into the breeding season (roughly into mid-April) and reform before breeding ceases (roughly beginning mid-July), information from incidental surveys of flocked birds during the breeding season is also available (Point Blue 2013, unpubl. data).

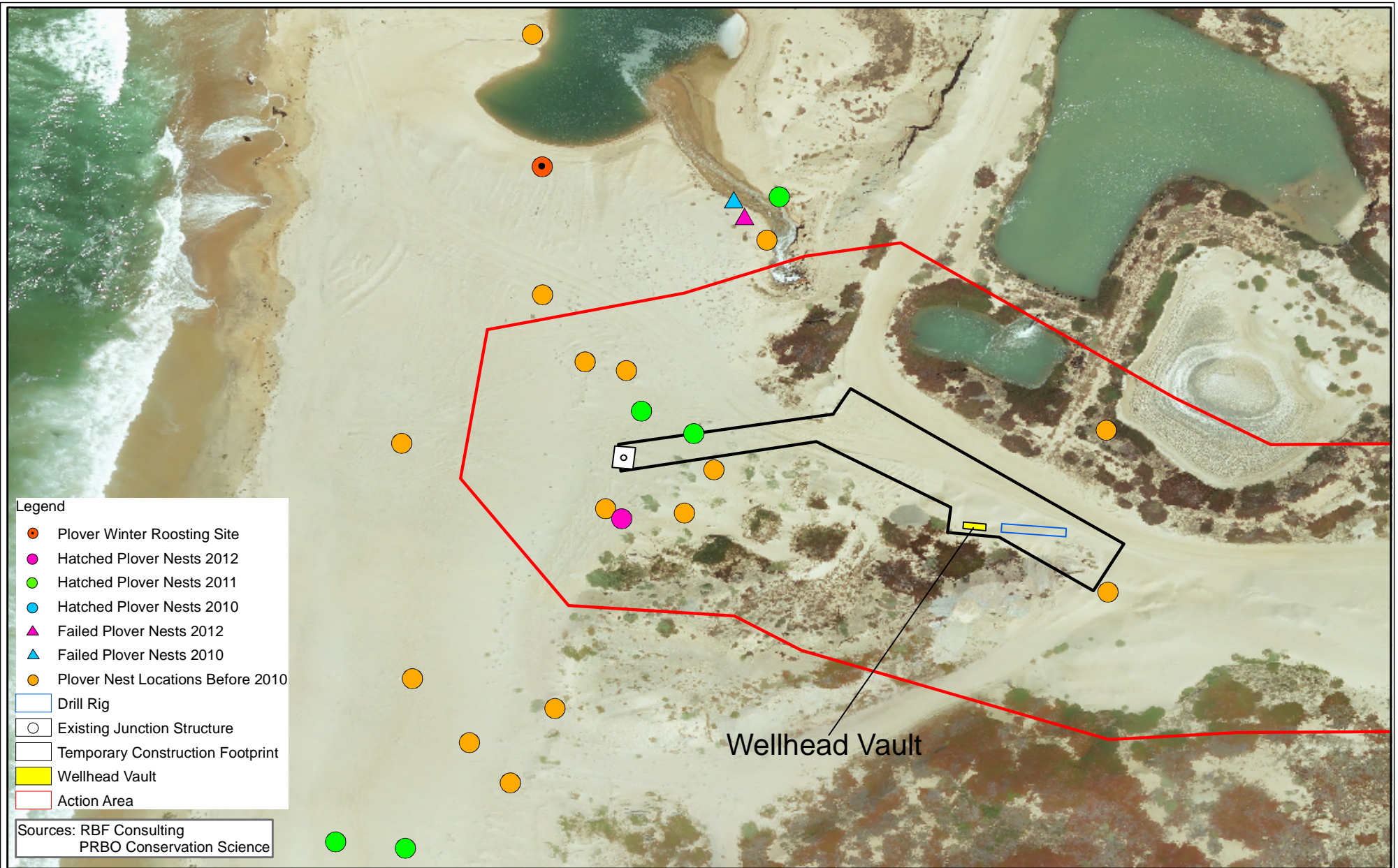
The breeding plover population size along the Cemex shoreline has varied from 39 to 60 plovers between 2003 and 2012 (Point Blue 2013, unpubl. data). At the adjacent Salinas River NWR to the north, the breeding population size has ranged from 34 to 68, for an average of about 105 nesting snowy plovers within and directly adjacent to the action area. The most recent monitoring activity (2012 nesting season) identified about 38 nesting attempts with 23 successfully hatched (Figure 6) along the Cemex shoreline (Page et al 2012). The nests are typically located between the spring and summer wrack zone and the base of the foredunes, but can also be found around the Cemex pond and adjacent to the Cemex access road, within the action area (Figure 5).

Numbers of plovers recorded on the annual winter window surveys of shoreline areas have been highly variable, probably due to the irregular distribution of plovers in winter. According to Appendix B of the Recovery Plan, numbers of wintering birds along the subject shoreline ranged from 0 to 63 over the period 2000-2005 (USFWS 2007). Between 2005 and 2012, numbers ranged from 0 to 21 individuals along the Cemex shoreline and from 0 to 34 at the adjacent Salinas River NWR. Data from the recent annual winter window survey indicate that 37 adult plovers were observed between the Salinas River NWR and the southern end of the Cemex shoreline during a one day reconnaissance on January 22, 2013 (Point Blue 2013, unpubl. data).

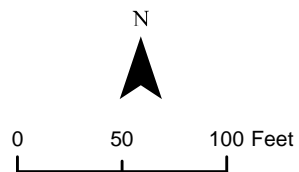
5.3 Yadon's Wallflower

5.3.1 Status and Description

Yadon's wallflower is one of four subspecies of *Erysimum menziesii*. When first listed as endangered by the State of California in 1984, and later by USFWS in 1992 (57 FR 27848), *E. menziesii* was treated as a single species distributed in coastal dune systems from Monterey County to Oregon. Following its listing, research showed that the species is a complex, comprised of four subspecies, three of which are rare. According to the Recovery Plan for the species (USFWS 2008), the three rare subspecies (ssp. *menziesii*, ssp. *eurekaense*, and ssp. *yadonii*) are endemic to three counties in northern California and are known from sixteen populations consisting of about 33,300 individuals. The fourth subspecies, cream-colored wallflower (ssp. *concinnum*), is not listed; its distribution extends from southern Oregon to Point Reyes in Marin County, California. These subspecies are primarily differentiated by geographic location. Critical habitat has not been proposed for the species.



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Western Snowy Plover Locations
MPWSP
Temporary Slant Test Well
Marina, California

Figure
5

Erysimum menziesii is a biennial or perennial herb in the Mustard Family (Brassicaceae). Flowers are fragrant and pale to bright yellow. Each plant usually has several flowering stems from 1-6 inches tall. The fleshy leaves form a basal rosette and are somewhat spoon-shaped and abruptly narrow to the leaf stalk. The fruit consists of very long, narrow pods, 1-5 inches long. While the other subspecies of *E. menziesii* typically have a blooming season limited to late winter or spring, *E. menziesii* ssp. *yadonii* often blooms through the summer (June-August) and tends to be perennial with a branched caudex (thickened stem).

5.3.2 Distribution and Habitat

Yadon's wallflower is restricted to four occurrences in the vicinity of the Marina Dunes, two at Marina State Beach, and the others at the Cemex Lapis Sand Plant property approximately 0.8-kilometer (0.5 mile) south of the Salinas River Lagoon (USFWS 1998). The largest sub-populations (thousands of plants) have been recorded in the stable foredunes around the Cemex facility and Marina State Beach in the southern portion of the Monterey Bay dune complex.

Yadon's wallflower can occur on the upper coastal strand, in areas relatively close to the high tide line, but largely protected from wave action. The subspecies has a high tolerance to exposure to strong wind, salt spray, and occasional wave action from storms and high tides. Its preferred substrate is loose sand lacking in organic matter and minerals (USFWS 1998). Associated species include beach primrose, beach-bur, sea rocket, beach knotweed, sand verbena and iceplant.

5.3.3 Life History

Erysimum menziesii is a biennial or short-lived perennial. The species reproduces by seed, and the seeds are dispersed by wind. Subspecies *yadonii* can be perennial, but does not typically fruit more than twice. Yadon's wallflower forms a basal rosette of leaves that may persist for up to eight years before flowering. Blooming typically occurs from March through April, although it may begin as early as late February with an extended blooming season well into the summer months. The species is self-compatible; therefore, the reproduction of this species involves selfing and facultative outcrossing (able to produce seed either by self-pollination, or pollination by other plants). Evidence suggests that the seed bank is contained in the old standing plants and that the seed in the soil (sand) does not seem to persist (USFWS 1998). Most seed dispersal is restricted to the immediate vicinity of the parent plants. Long distance dispersal of seed may occur by fragmentation of seed-bearing branches breaking off and tumbling with the prevailing wind.

5.3.4 Threats to Survival

The species is threatened by invasion by non-native species, industrial and residential development, and trampling by recreational users such as pedestrians, equestrians, hang gliders, and ORV users (USFWS 1992). Coastal erosion, sand mining activities, and the deposition of dredge material from adjacent water bodies pose additional threats to the plants in Monterey County.

5.3.5 Occurrence within the Action Area

The CNDDDB lists two separate element occurrences for *Erysimum menziesii* on the Cemex property (EO 17 & EO 18). One of the occurrences (EO 18 - approximately 500 plants in observed 1991) is south of the action area along the southern Cemex property line with the Marina Dunes Preserve, and may be the result of dune restoration activities in that area. The other occurrence (EO 17) is described as about 13,900 plants observed and mapped in 1986, 1987 and 1997 “along the west face of the dunes from the railroad tracks [*parallel to the existing east west Cemex access road*] to about 0.9 miles north of the railroad tracks.” The CNDDDB mapping for EO 17 indicates a small wallflower population adjacent to the Cemex access road with most of the plants mapped in an area of the upper strand and foredunes north of the Cemex facility. However, large numbers of those plants were reported to have been lost during winter storms of 1998.

Field surveys conducted on the Cemex property in May and June 2012 identified Yadon’s wallflower along the seaward side of the dunes, north of the Cemex operations area (ESA 2012). A large population was mapped between the face of the foredunes to approximately 100 feet inland (Figure 6). ESA also observed Yadon’s wallflower at the southern end of the Cemex property along the north and south sides of the beach access path between the Cemex property and Marina Dunes Preserve. These observations are generally consistent with the CNDDDB records noted above. However, ESA did not conduct surveys within the action area adjacent to the Cemex access road.

Emerging basal rosettes of several individuals of *E. menziesii* were observed on March 5th, approximately 400 feet south of the access road, where less disturbed dune areas occurred. No individuals of *E. menziesii*, or any other wallflower species, were observed during the April 25, 2013 survey anywhere within the action area.

5.4 Monterey Gilia

5.4.1 Status and Description

Monterey gilia was listed as federally endangered on June 22, 1992 (57 FR 27848) and it was listed by the State of California as threatened in January 1987. Critical habitat has not been proposed for the species.

Monterey gilia is a short, sticky-haired annual herb in the phlox family (Polemoniaceae). It has an erect central stem with a basal rosette of leaves, and produces purple funnel-shaped flowers with narrow petal lobes and a purple throat. Monterey gilia is distinguished from the other three subspecies of *G. tenuiflora* by its relatively large fruit capsules and stamens which are only slightly exerted from the corolla. Sand gilia is known to locally intergrade with *G. tenuiflora* ssp. *tenuiflora* at the more inland areas of its distribution at Fort Ord.

5.4.2 Distribution and Habitat

Monterey gilia is endemic to the Monterey Bay and Monterey Peninsula dune complexes. It is distributed in discontinuous populations and its range extends from Spanish Bay on the Monterey

Peninsula north to Sunset Beach State Park in Santa Cruz County (CDFW 2013). Most of these populations are on private land and are unprotected. Along the coast, Monterey gilia is found on rear dunes, near the dune summit in level areas, and on depressions or slopes in wind-sheltered openings in low-growing dune scrub vegetation. It does not occur in areas exposed to strong winds and salt spray (USFWS 2005). On ancient dune soils, which extend inland six to eight miles in the former Fort Ord area, it occurs in openings among maritime chaparral, coastal sage scrub, oak woodlands and where other vegetative cover is low.

The plant occurs along trails and roadsides, on the cut banks of sandy ephemeral drainages, in recently burned chaparral, and in other disturbed patches. It appears to do well on sites that have undergone recent substrate disturbance. Most populations are small and localized.

5.4.3 Life History

Monterey gilia is an annual herb that typically germinates from December through February. It is able to self-pollinate as well as outcross, and fruit is set from the end of April to the end of May (USFWS 2005). It produces small seeds that are dropped or shaken from their capsules and are then dispersed, likely by gravity or wind. The species appears to produce viable seed even at very small statures. Seeds are dispersed by wind throughout the dune openings; dispersal is inhibited however by dense stands of low-growing dune scrub.

5.4.4 Threats to Survival

The loss of populations and habitat for Monterey gilia has resulted from coastal urban development and sand mining operations. Recreational users, such as off-road vehicle users, hikers, and equestrians, threaten populations and habitat. The introduction of aggressive, non-native species like iceplant and European beach grass (*Ammophila arenaria*) for dune stabilization has altered habitats, resulting in unsuitable conditions for sand gilia. Commercial and residential development near Marina, Seaside, Sand City, and the Monterey Peninsula threaten remaining Monterey gilia populations.

5.4.5 Occurrence within the Action Area

The CNDDDB lists several occurrences of Monterey gilia on the Cemex facility with one of them just north of the action area adjacent to the Cemex facility access road (EO 26). This location was recorded in 1998 as 1.25 miles northwest of the junction of Hwy 1 and Reservation Road; the CNDDDB indicates that better mapping detail is needed for this occurrence.

ESA did not observe gilia during its field surveys conducted on the Cemex property in May and June 2012, but did find the species during separate reconnaissance surveys conducted along the southern property boundary with the Marina Dunes Preserve in April 2012. The area identified was likely part of a dune restoration effort on Marina Dunes Preserve lands.

No individuals of Monterey gilia were observed in the action area during the April 25, 2013 survey, but reference locations with plants in bloom were checked on that same day to confirm the appropriate seasonality of the survey.

5.5 Monterey Spineflower

5.5.1 Status and Description

Monterey spineflower was listed by USFWS as threatened on February 4, 1994 (54 FR 5499). It is not listed by the State of California but is considered rare, threatened, or endangered in California and elsewhere by the California Native Plant Society (Rank 1B.2). Critical habitat was designated on May 29, 2002 (67 FR 37498) but in response to a lawsuit filed in March 2005, USFWS proposed revisions to that designation and issued a revised critical habitat designation on January 9, 2008 (73 FR 1525).

Monterey spineflower is an annual herb in the buckwheat family (*Polygonaceae*). It has involucre lobe margins (edges of the spines) that are white (rarely pinkish) rather than dark pinkish to purple and the plants tend to be prostrate rather than erect (Reveal and Hardham 1989). The involucre's awns are hooked at the tip (uncinate). Monterey spineflower blooms from April through June most years.

5.5.2 Distribution and Habitat

Monterey spineflower occurs along the coast of southern Santa Cruz and northern Monterey Counties and inland to the coastal plain of the Salinas Valley. It is found in areas of relatively mild maritime climate, characterized by fog and winter rains. The fog helps keep summer temperatures cool and winter temperatures relatively warm, and provides moisture in addition to the normal winter rains.

The species colonizes open sandy sites and tends to invade roadsides and firebreaks. It is found in maritime chaparral, coastal live oak woodland, coastal scrub, grassland, and coastal dune habitats. The distribution of suitable habitat within dune systems is subject to inherent dynamic shifts caused by patterns of dune mobilization, stabilization, and successional trends in coastal dune scrub that reduce vegetation gaps. Accordingly, individual colonies of Monterey spineflower in unstable habitat are naturally subject to substantial long-term turnover and shifts in distribution and size (USFWS 1998).

5.5.3 Life History

Monterey spineflower is likely self-pollinated in addition to being insect pollinated. It produces small seeds that are dropped or shaken by wind from their capsule and may then be dispersed with blowing sand or by fur-bearing animals to which the spiny fruits may attach and be carried. Seedlings establish in areas that are relatively free from other competing native species. Human-caused disturbances, such as scraping of roads and firebreaks, can reduce the competition from other herbaceous species and consequently provide temporarily favorable conditions for Monterey spineflower. However, such activities also often promote the spread and establishment of nonnative species; in addition, they can bury the seedbank of Monterey spineflower, and they do not result in the cycling of nutrients and soil microbial changes that are associated with large-scale natural disturbances such as fires (USFWS 2008a).

Monterey spineflower appears to function as an opportunistic annual plant, with most of its seeds germinating under variable winter conditions rather than persisting to create an extensive, long-lasting soil seed bank (USFWS 2008a).

5.5.4 Threats to Survival

Urban development in coastal cities has resulted in the loss of large portions of the range of Monterey spineflower. Introduction of non-native, aggressive plants like iceplant and European beach grass for dune stabilization has altered typical Monterey spineflower habitat and made conditions unsuitable for the species. Historic occurrences in the Salinas Valley have been extirpated, primarily because of conversion of natural habitat to agricultural land.

5.5.5 Occurrence within the Action Area

The CNDDDB reports several occurrences of Monterey spineflower on leeward side of the dune complex on the Cemex property, mostly resulting from surveys conducted in 1986 and 1987 for the Marina Dunes Plan (Thomas Reid Associates 1987). One of these occurrences (EO 17) is mapped just north and toward the easterly (inland) end of the action area along the Cemex facility access road. The location information for this occurrence is listed as north of Marina, 0.5 mile west of Lapis Siding; it was most recently observed in 2006.

ESA observed Monterey spineflower and suitable habitat for the species throughout the dune habitats they surveyed on the Cemex property by in May and June 2012. However, the ESA survey area did not include the Cemex facility or access road. During Zander Associates April 25, 2013 survey Monterey spineflower was observed within the action area and was relatively abundant in some areas, often growing in sandy substrates directly adjacent to the access road. However, no Monterey spineflower was found within the active roadbed.

6.0 POTENTIAL EFFECTS OF THE PROPOSED ACTION ON LISTED SPECIES

The Project has been designed to minimize impacts on listed species and critical habitat; however, activities associated with the work could result in direct or indirect effects on Monterey spineflower or on nesting or wintering western snowy plovers. The potential effects of the Project on listed species known to occur in the area and designated critical habitat for two of them are discussed in more detail below. Measures that will be incorporated into the project to minimize these effects are discussed in Section 7.0.

6.1 Effects on Listed Plants

The proposed test well project is not expected to adversely affect any of the three listed plants under consideration in this BA. The only special status plant species known to occur in the action area is Monterey spineflower. Monterey gilia and Yadon's wallflower were not found during spring 2013 surveys. Monterey spineflower was found scattered throughout bare sand areas adjacent to the access road but not within the active roadbed. The proposed schedule for the test well project (October through February) would fall outside of the active growing season for Monterey spineflower. While there may be some limited potential for seed bank disturbance for Monterey spineflower, such effects would be minimal. Minimization measures identified below (Section 7.0) are intended to reduce the potential for any effects on Monterey spineflower.

6.2 Effects on Listed Animals

6.2.1 *Smith's blue butterfly*

Because the proposed project would occur outside of the flight season for Smith's blue butterfly, no direct (e.g. windshield hits) or indirect (e.g. dust on the nectaries of buckwheat foodplants) impacts on adult butterflies are expected. However, project related effects on pupal stages of Smith's blue butterfly could result from direct disturbance in close proximity to coast buckwheat plants. Because all project-related activities would occur in previously disturbed areas, the potential for disturbance in close proximity to any coast buckwheat plants would be very low. Minimization measures identified below (Section 7.0) are intended to reduce the potential for any effects on these plants.

6.2.2 *Western snowy plover*

The potential for direct impacts to nesting western snowy plovers has been minimized through project design and scheduling (see below). However, there remains some potential for direct effects on nesting habitat and indirect effects on wintering plovers' roosting, foraging and pre-nesting behavior.

Direct effects on nesting habitat could occur through disturbance of the short (about 100 feet) segment of upper beach between the end of the existing Cemex facility access road and the existing outfall junction structure. Trenching for a discharge pipeline and excavation of an area approximately 20 to 30 feet in diameter at the junction structure location would occur within plover nesting habitat during the non-breeding season. Monitoring records (Page et al 2010, 2011 & 2012) indicate that at least three nesting attempts have occurred in the immediate vicinity of this area during the last three breeding seasons, with two successful hatches in 2011 and one in 2012 (Figure 5). Several more nesting records (undifferentiated by failure or success) exist for that area over the course of Point Blue's monitoring (Figure 5). Sand disturbance resulting from trenching for the pipeline, excavation at the junction structure, and heavy equipment required for such excavation could create uneven, compacted terrain that would not be removed by wave and storm action prior to the breeding season. The effects of human-induced sand disturbance in long-established plover nesting habitat are not well understood, but may affect localized breeding behavior and nesting success.

Potential indirect effects on the wintering population of plovers along the Cemex shoreline and nesting habitat just west of the test well could result from increased activity in the action area over the 24-month operation period. During the non-breeding season, some of the most frequently used roosting sites along the Cemex shoreline are located on the beaches just to the north and south of the Cemex pond, though flocks can occur anywhere (Point Blue 2013, unpubl. data). This area typically experiences little recreational use by humans (and their pets), especially during the winter months, and is only subject to limited activity associated with Cemex operations.² Consequently, roosting plovers in this area are accustomed to a relatively

² The need to move the dredge anchors around the Cemex extraction pond requires periodic use of equipment around the pond.

low level of disturbance (activity that causes plovers to move or fly) compared with the more accessible and public beaches to the south. An increase in disturbance to wintering flocks by increased human activity in the area could cause roosting birds to move, fly or otherwise alter their spatial distribution. However, because of their site fidelity and narrow habitat requirements, snowy plovers typically have few alternative roosting sites (Lafferty 2001). In addition, disturbance of wintering plovers may reduce foraging efficiency and opportunities for rest, which in turn may deplete energy reserves and result in lower reproductive success (Brown et al 2000, Burger 1994). In some cases, increased human disturbance can cause birds to abandon habitat altogether (Burger, 1986).

A study conducted on wintering snowy plovers in Santa Barbara concluded that disturbance rates are a function of the type of human activity, the frequency of activity and the distance between the activity and snowy plovers (Lafferty 2001). In that study, snowy plovers were most frequently disturbed when approached closely by people and animals, especially dogs. The probability of disturbance decreased with distance between human activity and the roost; relatively few people and dogs beyond 30 meters (just under 100 feet) were found to disturb roosting plovers. There was also some evidence that plover feeding was affected by activity on the beach.

Weekly access to the test well site by crew trucks over a 24 month period would increase regular activity in the vicinity of roosting and nesting habitat. Because that activity would occur greater than 100 feet from potential roost sites in an area that is buffered by topography and already used by Cemex for its operations, potential disturbance to wintering plovers is expected to be minimal. Regular monitoring in the area by Point Blue Conservation Science during the nesting season would inform crews about nesting attempts in the area so that maintenance visits could be scheduled and conducted to reduce disturbance to nesting birds. Further details and additional minimization measures intended to reduce the potential for project-related effects on snowy plover nesting habitat and winter roosting birds are identified below (Section 7.0).

6.3 Effects on Critical Habitat

6.3.1 *Monterey spineflower*

The Federal Register listing notice for Monterey spineflower critical habitat (75 FR 1525) defines activities that may destroy or adversely modify critical habitat as those that alter the essential physical and biological features to an extent that appreciably reduces the conservation value of critical habitat for Monterey spineflower. It identifies such activities as (1) actions that would degrade or destroy native maritime chaparral, dune, and oak woodland communities, including, but not limited to, livestock grazing, clearing, disking, introducing or encouraging the spread of nonnative plants, and heavy recreational use; and (2) actions that would appreciably diminish habitat value or quality through indirect effects (e.g., edge effects, invasion of nonnative plants or animals, or fragmentation).

All project-related activities would occur in previously disturbed areas that are not essential for Monterey spineflower. The project would not cause the degradation or destruction of native

dune communities in the vicinity because access through these areas would follow an existing road currently used for the Cemex facility.³ The project is also not expected to diminish the value of the dune habitat such that it would preclude maintenance or establishment of Monterey spineflower plants. Consequently, the project would not destroy or adversely modify critical habitat for Monterey spineflower.

6.3.2 Western snowy plover

The adverse modification determination included with the designation of critical habitat for the Pacific Coast distinct population unit of the western snowy plover (77 FR 36727) lists five activities that may affect critical habitat: 1) management actions in snowy plover habitat; 2) dredging and dredge spoil placement that permanently removes the essential physical or biological features of the habitat; 3) construction and maintenance of facilities that interfere with snowy plover nesting, breeding, or foraging, or that result in increases in predation; 4) storm water and waste water discharge that could impact invertebrate abundance; 5) flood control actions that alter the essential biological or physical features of the habitat.

The proposed project would incorporate several measures to avoid or minimize impacts on breeding and wintering snowy plovers and their habitat (see below). All construction and demobilization activities would be limited to the plover's non-nesting season (October 1st through February 28th). Project facilities would be located within existing disturbed areas on or adjacent to the active Cemex access road. However, a limited area of plover nesting habitat would be temporarily disturbed for the trenching and excavation required to connect the discharge pipeline to the existing outfall junction structure. Nevertheless, the project is not expected to alter essential physical and biological features to an extent that appreciably reduces the conservation value of critical habitat for snowy plover.

7.0 MINIMIZATION AND MITIGATION MEASURES

In response to concerns expressed through early consultation with regulatory agencies (see Section 2.0 above), construction and demobilization activities would occur in the fall and winter months, outside of the breeding season for western snowy plovers, the flight season for Smith's blue butterfly and the blooming season for listed plants. The test well site has been shifted inland to minimize or avoid disruption of the snowy plover nesting habitat. The construction zone would be restricted to the previously disturbed Cemex access road area and a relatively short (± 100 ft.) section of the upper beach for connection to the existing outfall structure. The test well pump would be a submersible pump and is not expected to generate noise or vibration that would be detectable in the nearby snowy plover nesting area.

³ The Final Rule designating critical habitat for spineflower specifically excludes manmade structures (such as buildings, aqueducts, airports, and roads) and the land on which such structures are located.

7.1 Monterey Spineflower

7.1.1 Pre-construction flagging

A qualified biologist would conduct late season (August/September) surveys along the Cemex access road prior to project initiation in an effort to flag the occurrences of spineflower that occur within potential work areas. Monterey spineflower occurrences within 20 feet of the access road and perimeters of the work areas will be identified and marked.

7.1.2 Habitat avoidance

Occupied habitat areas, as identified and flagged by a qualified biologist (see above), would be avoided by the project to the extent feasible. In the event that any such areas occur within proposed trenching, excavation or drilling sites, the biologist would establish appropriate buffers and access procedures, which would be monitored during the term of the project (see below).

7.1.3 Timing of construction and operation

The project would commence on October 1st and continue through the winter months to February 28th. This five month period is outside of the active growing season for Monterey spineflower, which is ephemeral; it generally germinates from seed in the spring with annual growth and bloom cycles complete by autumn.

7.1.4 Biological resource education and monitoring

Prior to initiation of access or construction activities, a qualified biologist would be designated to conduct an educational training session regarding the listed plant species with all construction personnel. The training would include a description of the plants and their habitat preferences with illustrations of each species (project timing would not allow field identification). The biologist would also monitor equipment access in order to avoid disturbance to areas that support Monterey spineflower as identified through the pre-construction flagging (see above).

7.2 Smith's Blue Butterfly

7.2.1 Pre-construction surveys

A qualified biologist would conduct a survey with the appropriate project team members prior to initiation of access or construction activities to identify and mark the electrical conduit trench alignment to assure that no buckwheat plants would be disturbed. Buckwheat occurrences within 20 feet of the access road and work areas would also be identified and marked as necessary.

7.2.2 Avoidance of buckwheat

Buckwheat plants or clusters of plants, as identified and flagged by a qualified biologist (see above), would be avoided by the project. The biologist would establish appropriate buffers and access procedures for any buckwheat plants occurring within 20 feet of the existing access road, which would be monitored during the term of the project (see below).

7.2.3 Timing of construction and operation

Project construction would commence on October 1st and continue through the winter months to February 28th. This five month period is well outside of the active flight season for adult Smith's blue butterflies. It is also outside of the active larval stage of the species. Pupae (the overwintering or dormant stage of the life cycle) are typically found in the soil at the base of buckwheat foodplants during this period, but avoidance of, and setbacks from any buckwheat plants would avoid potential impacts to pupae of the butterfly.

7.2.4 Biological resource education and monitoring

Prior to initiation of access or construction activities, a qualified biologist would be designated to conduct an educational training session regarding Smith's blue butterfly with all construction personnel. The training would include a description of the butterfly's life cycle and habitat preferences and identification of buckwheat along the access road. The biologist would also monitor equipment access in order to avoid disturbance to buckwheat plants or encroachment into areas supporting buckwheat.

7.3 Western Snowy Plover

7.3.1 Timing of construction and operation

Project construction and demobilization activities would commence on October 1st and continue through the winter months to February 28th. This five month period is outside of the active breeding and nesting season for western snowy plovers. The intent is to avoid disruption of plover breeding behavior and eliminate all evidence of construction activities prior to the beginning of plover breeding season (see below).

7.3.2 Project siting and configuration

The test well site would be located within the active Cemex access road area to minimize or avoid disruption of potential snowy plover nesting areas along the shoreline. If required, noise blankets would be installed to provide visual and sound attenuation during drilling operations. The test well pump would be a submersible pump that is not expected to generate detectable noise or vibration in snowy plover nesting areas once in operation. Features (wire excluders) would be incorporated into the top of the above-ground electrical panel at the test well, if necessary, to deter perching by avian predators (e.g. ravens and crows).

7.3.3 Construction limits

Construction activities would be restricted to the proposed construction area and access route. No construction equipment, materials, or activity would occur outside the specified work areas. No construction equipment or materials would be placed, nor would any activity occur on the sandy upper beach area outside of the immediate construction zone.

7.3.4 *Trash and fuel management*

Construction personnel would keep all food-related trash items in sealed containers and remove them daily from the project site to discourage the concentration of potential predators in snowy plover habitat (see also use of wire excluders in measure 7.3.3 above). Refueling of construction equipment and vehicles would not occur in the project area. Construction personnel would check and maintain equipment and vehicles operated in the project area daily to prevent leaks of fuels, lubricants or other fluids, in compliance with applicable state and federal regulations.

7.3.5 *Work area recontouring*

Following completion of the drainage pipe connection to the existing outfall junction structure and after all construction equipment has left the area, but before March 1st, the work area at the end of the Cemex access road would be recontoured as determined necessary coordination with representatives of Point Blue. The purpose for the recontouring would be to achieve the optimum configuration possible for potential nesting plovers.

7.3.6 *Sampling procedures during operation*

A qualified biologist would consult with Point Blue monitors on a weekly basis during the plover nesting season to stay current with nesting activity in the vicinity of the test well. The biologist would coordinate weekly with any Cal Am personnel travelling to the test well during the 24 month operation period and accompany them as necessary during the nesting season based on information received from Point Blue.

7.3.7 *Biological resource monitoring and education*

Several days or more prior to project construction, a qualified biologist, in consultation with Point Blue, would field evaluate the nature and extent of wintering plover activity in the project area to inform excavation and other construction decisions. Also prior to construction of access or construction activities, the biologist would conduct an educational session with all construction personnel to describe snowy plover wintering and breeding behavior, habitat preferences, threats and other issues. The biologist would also monitor equipment access and construction/operation activities along trench lines, at the wellhead site, and in the excavation area for the outfall connection during the project term in order to avoid or minimize disturbance to potential nesting habitat for snowy plovers and the overwintering flocks in the area.

8.0 CUMULATIVE EFFECTS

The data and experience gained from the project are intended to contribute to the siting and design decisions for the potential future MPWSP project, which could involve a feedwater intake system, a desalination plant, a brine conveyance and disposal system, and a desalinated water conveyance system. Experience from the slant test well project to date would likely lead the MPWSP project to similar siting and operational conclusions (e.g. maximizing use of existing disturbed areas; limiting construction activities near the beach to the non-nesting season for snowy plovers).

Nonetheless, the MPWSP is a separate, potential future project requiring separate environmental review and permitting. The slant test well would be a temporary permitted facility until March of 2016 and is independent of any future permanent desalination facility. In fact, the temporary slant test well design precludes future permanent use due to lack of conveyance infrastructure. Conversion of the temporary slant test well to a permanent well would require considerable additional information such as conveyance, pumps and treatment, all of which would be addressed as part of a separate CEQA and permitting process for the potential future MPWSP.

9.0 CONCLUSION AND DETERMINATION

The proposed Temporary Slant Test Well Project would occur in an area known to support three federally listed plants, two listed animals and critical habitat for two of these species. However, the specific locations, timing and operating procedures of project activities were selected to avoid or minimize impacts to these species and critical habitat. All areas proposed for project-related activities occur in previously disturbed areas. The proposed schedule for the test well project construction (October through February) would fall outside of the growing season for the listed plant species and the critical activity periods for the listed animals. Reasonable and prudent minimization measures have been incorporated into the siting, design, construction and operation of the project.

The proposed project is not expected to adversely affect any of the three listed plants under consideration in this BA: Monterey gilia (*Gilia tenuiflora* ssp. *arenaria*), Yadon's wallflower (*Erysimum menziesii* ssp. *yadonii*) and Monterey spineflower (*Chorizanthe pungens* var. *pungens*), or adversely modify critical habitat for the latter species. Similarly, the proposed project is not expected to adversely affect the Smith's blue butterfly (*Euphilotes enoptes smithi*), primarily because adults of that species are not present during the term of the project and foodplants for the species would be avoided.

Impacts to nesting habitat for the western snowy plover (*Charadrius nivosus nivosus*) would be very limited; potential effects on wintering behavior are not expected to harm the local population of the species. With implementation of all the minimization measures proposed above, the project is not likely to adversely affect the western snowy plover or appreciably diminish the value or quality of its critical habitat.

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TECHNICAL MEMORANDUM

**BIOLOGICAL RESOURCES ASSESSMENT
MPWSP
EXPLORATORY BORINGS PROGRAM
PACKAGE 1 – CEMEX ACTIVE MINING AREA**

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June 2013

**BIOLOGICAL RESOURCES ASSESSMENT
MPWSP EXPLORATORY BORINGS PROGRAM
PACKAGE 1 – CEMEX ACTIVE MINING AREA**

Zander Associates is providing this evaluation of the Exploratory Borings Program, Package 1 project, proposed by California American Water (Cal Am) to identify and discuss potential project effects on biological resources. The exploratory borings are being proposed to gather technical data related to feasibility of a subsurface intake system for a potential future desalination project. The data will be used to facilitate design and intake siting for the separately proposed slant test well and slant wells for the full-scale Monterey Peninsula Water Supply Project (MPWSP).

Our evaluation is based on review of background materials including a current query of the California Natural Diversity Data Base (CDFW 2013), surveys of existing biological resources in the project area completed by ESA Biological Services (Memorandum dated June 13, 2012), recent monitoring reports on western snowy plover prepared by PRBO Conservation Science (December 2012), and other documents. We consulted with resource agency personnel and acknowledged authorities in particular habitats and species known to occur in the project area and conducted reconnaissance-level surveys of the project area on September 20, 2012, March 5, 2013, and April 25, 2013.¹ This latter visit involved a complete floristic survey within 100 feet of either side of the existing Cemex access road at an appropriate time of year to identify most of the special status plants that might occur in the project area (see below).

Location and General Site Characteristics

The Package 1 Project of the Exploratory Borings Program includes three boring locations, all of which are located on lands owned by Cemex (APN 203-011-019-000) within the limits of the City of Marina (Figure 1). The borings would be sited adjacent to the unimproved roadway used by Cemex to access the sand mining pond (Figure 2) and all would be accessed via this road. For purposes of this assessment, the project area includes an approximate 200-foot-corridor along the existing Cemex access roads from the eastern Cemex site entrance all the way to its western end (Figure 2). This area is comprised of developed industrial facilities and disturbed, formerly mined coastal sand dunes.

Project Description

Three exploratory borings are planned for the Package 1 Project: CB-1, CB-2, and CB-4 (Figure 2). For each boring, a track-mounted diesel powered sonic drilling rig would be used to collect the core samples (Figure 3). The work area needed for the drill rig, support equipment, and area to layout the core samples at each boring location would be approximately 50 feet by 30 feet. No fences or additional security measures would be required around the drill rig sites. Exploratory borings would extend down to 350 feet at all three locations. Core samples would be collected, bagged and carried off-site for further sampling and analysis. Boring holes would be back-filled with cement.

¹ Zander Associates did not conduct species-specific surveys for all special-status plants and animals that could potentially occur in the project area.

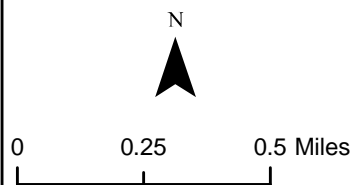


Boring Locations

Legend

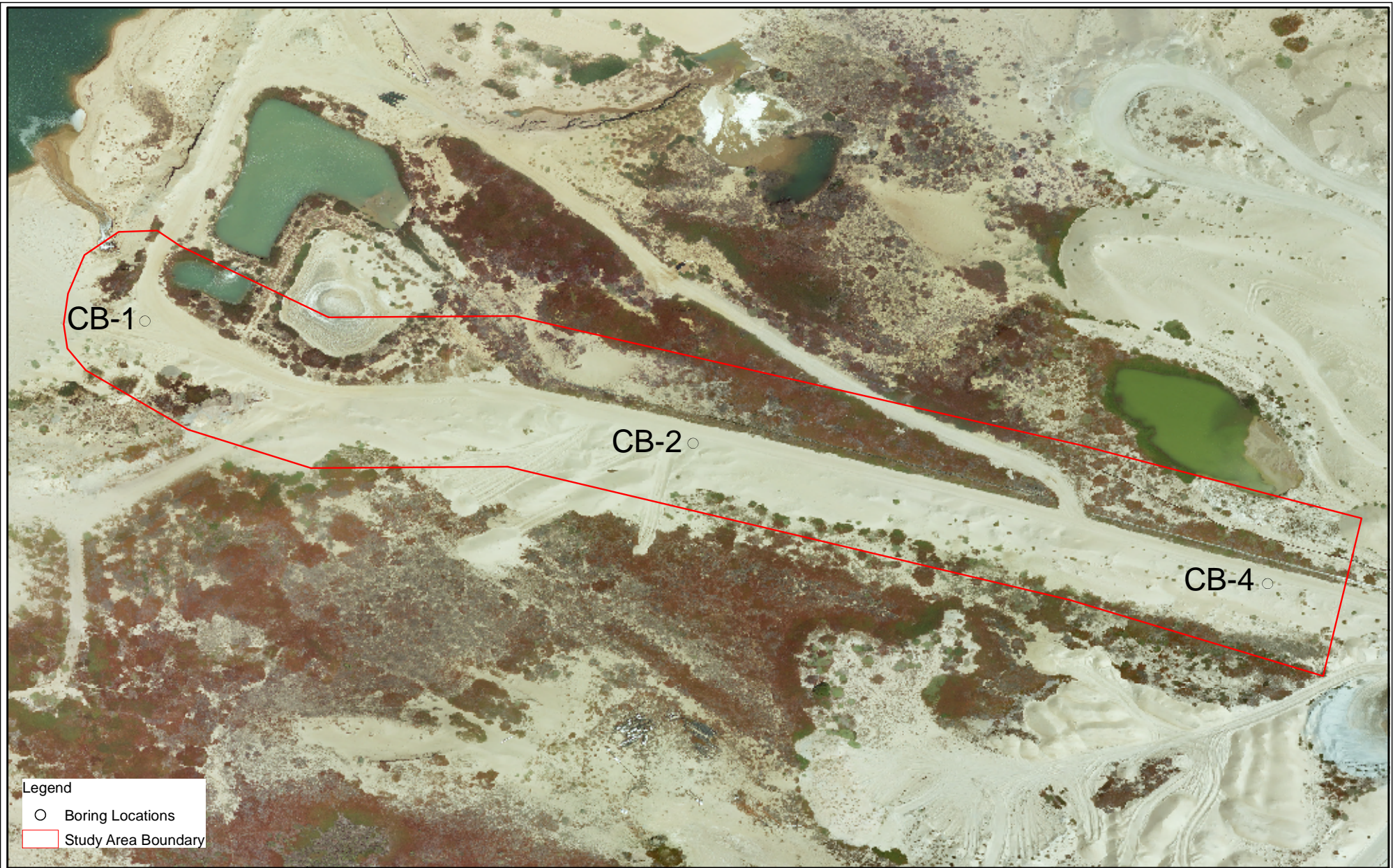
- Boring Locations
- ▭ Parcel Boundary

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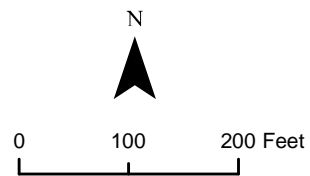


Site Location
 MPWSP
 Exploratory Borings, Package 1
 Marina, California

Figure 1



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Project Study Area
MPWSP
Exploratory Borings, Package 1
Marina, California

Figure
2



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San Rafael, CA 94903

Track-Mounted Drill Rig
MPWSP
Exploratory Borings, Package 1
Marina, California

Figure
3

Drilling is planned for summer 2013; mobilization, drilling, and demobilization would be completed during a three day period and the drilling rig would only be operated during the daylight hours.

Site Protection during Construction: All construction work will occur in the active/disturbed areas of the Cemex site. The CB-1 location (at the western end of the Cemex access road), will be field evaluated by the project biologist in consultation with PRBO, to avoid significant impacts to western snowy plover. If there are still active snowy plover nests in close proximity to CB-1 at the preferred time of drilling, additional avoidance/minimization measures will be applied at the direction of the Project biologist and PRBO such that no adverse effects occur to snowy plover (see below).

Existing Conditions

The operations area at the Cemex Lapis Sand Plant includes administrative buildings, sand processing facilities and areas of disturbed dune characterized by beach sands and Aeolian sand dunes of the Flandrian complex overlying Pre-Flandrian dune deposits. The area covers about 104 acres and is the subject of an approved Reclamation Plan (CA Mine ID #91-27-0006). The project area includes an approximate 200-foot-corridor along the existing Cemex access roads from the eastern Cemex site entrance all the way to its western end.

The road from the site entrance to the vicinity of the wet processing plant is paved and passes through the Cemex facility on either side. No dune habitat (or any native habitat, disturbed or otherwise) occurs in this area based on observations during site reconnaissance visits on September 20, 2012, March 5, 2013 and April 25, 2013. From the Cemex facility westerly to the beach, the road consists of unvegetated, compacted sand with disturbed dunes on either side (Photo 1).² A redwood lined flume parallels the road on the north and carries process water to settling ponds near the beach end of the road (Photo 2). It is along this portion of the road where all three boring sites will be located.

During the March 5th and April 25th site visits, no undisturbed dune habitat was observed within 100 feet of either side of the unpaved road (Photo 3 and Photo 4). Where vegetation was present, iceplant (*Carpobrotus* spp.) was dominant, but occasional occurrences of native plants such as beach sagewort (*Artemisia pycnocephala*), mock heather (*Ericameria ericoides*), sand verbena (*Abronia* sp.), beach knotweed (*Polygonum paronychia*), and beach evening primrose (*Camissonia cheiranthifolia*) were observed. During the April 25th plant survey, Monterey spineflower (*Chorizanthe pungens* var. *pungens*) was found in bare sand areas within the project study area, and in some cases extended up to the edge of the road, but was not found within the active roadbed. Individuals of coast buckwheat (*Eriogonum latifolium*), a host plant for the Smith's blue butterfly, were also encountered within about 20 feet of the road, primarily on the northerly side of the flume adjacent to the road.

² A railroad spur formerly ran along the south side of this road out to the beach, but has since been removed.



Photo 1: Access road through Cemex facility looking west



Photo 2: Flume parallel to access road through Cemex facility looking east



Photo 3: Stockpiles along both sides of Cemex facility access road



Photo 4: West end of Cemex access road in approximate vicinity of CB-1

Special Status Species & Critical Habitat

Several species of plants and animals that are listed as threatened or endangered under the federal and/or state endangered species acts (ESA & CESA, respectively) are known from or could potentially occur in the project area. Designated critical habitat for one of these species, Monterey spineflower (*Chorizanthe pungens* var. *pungens*), includes the project area. Some plant species known to occur in the area are listed by the California Native Plant Society (CNPS), and some animals are considered species of special concern by the California Department of Fish and Wildlife (formerly Fish and Game). In addition, the City of Marina Local Coastal Land Use Plan (LUP) lists rare and endangered species for dune habitat areas within the plan area (LUP Exhibit 'A').

Table 1 presents the results of a current search of CNDDDB records within a three mile radius of the exploratory boring project area. It also includes those species listed in LUP Exhibit A that are otherwise not found in current CNDDDB records.³ Listing status, habitat characteristics and an assessment of actual or potential presence or absence in the project area are provided for each species.

Spring (April, May & June 2012) survey work conducted in dune and strand areas on the Cemex property by ESA Biological Services (Environmental Science Associates June 13, 2012) found special status plant species, including a sizeable population (6,000 to 8,000 plants) of the state and federally endangered Yadon's wallflower, the federally listed Monterey spineflower, the CNPS listed (1B) coast wallflower (*Erysimum ammophilum*), and suitable habitat for others, including the state threatened and federally endangered Monterey sand gilia (*Gilia tenuiflora* ssp. *arenaria*). Coast buckwheat (*Eriogonum latifolium*), a host plant for the federally endangered Smith's blue butterfly (*Euphilotes enoptes smithi*) was also observed in high densities throughout the study area for those surveys.

During field visits by Zander Associates biologists on September 20, 2012 and March 5, 2013, numerous individual coast buckwheat plants were observed along the east-west access road through the Cemex facility. Emerging basal rosettes of several individuals of *E. menziesii* were also observed on March 5th, approximately 400 feet south of the access road, where less disturbed dune areas occurred. During the April 25, 2013 survey, Zander Associates biologists again observed coast buckwheat plants, primarily on the north side of the road and no closer than about 15 feet from the road's edge. Monterey spineflower was just beginning its growing season, but was relatively abundant in some areas, often growing in sandy areas directly adjacent to the access road. However, no Monterey spineflower was found within the active roadbed. No other special status plant species were observed in the project area during the April 25th survey, but reference locations for many of the potential species were observed that same day to confirm the appropriate timing of the survey (see Table 1). Protocol-level, site specific surveys for special status animals that could use habitat in the project study area (e.g. legless lizards [*Anniella pulchra*], coast horned lizard [*Phrynosoma coronatum*]) were not conducted during any of these visits.

³ Some of the species listed in Exhibit A (e.g. bush lupines, coast buckwheat) were included by association with other special status species (e.g. legless lizards, Smith's blue butterfly) and have no formal legal status. Others were once candidates for federal listing status (e.g. globose dune beetle) but were dropped from consideration due to insufficient data to make any listing decision. Nonetheless, all of the species listed in LUP Exhibit A are included and assessed in Table 1.

Table 1: Special Status Species Evaluated for Potential to Occur within the Exploratory Borings Program Package 1 Project Study Area*

PLANTS	Status ¹ Fed/CA/CNPS	Habitat and Blooming Period	Assessment ²
<i>Arctostaphylos pumila</i> (Sandmat manzanita)	--/--/1B.2	Closed-cone coniferous forest, chaparral, coastal dunes, and cismontane woodland habitats; sandy soil with other chaparral associates; blooms February through May (evergreen)	Possible occurrence in undisturbed dune habitats in general vicinity but not observed or expected w/in project study area boundary
<i>Astragalus tener</i> var. <i>titi</i> (coastal dunes milk-vetch)	E/E/1B.1	Low ground, alkali flats, and flooded lands in coastal bluff scrub or coastal dunes along the coast; blooms March through June	Only limited and localized records for this plant in Monterey County. Habitats in project area not appropriate; not expected to occur.
<i>Castilleja latifolia</i> # (Seaside paintbrush)	--/--/4.3	Coastal strand, northern coastal scrub; perennial herb found on dunes in Monterey Bay area; blooms March through August.	Observed in undisturbed dune habitats in general vicinity but not observed or expected within project study area boundary.
<i>Chorizanthe pungens</i> var. <i>pungens</i> (Monterey spineflower)	T/--/1B.2	Coastal dunes, chaparral, cismontane woodland, and coastal scrub habitats in Monterey and Santa Cruz counties; blooms April through June	Found in disturbed areas adjacent to Cemex access road but not found or expected to colonize active roadbed.
<i>Ericameria fasciculata</i> # (Eastwood's golden bush)	--/--/1B	Sandy openings of closed-cone coniferous forest, maritime chaparral, coastal scrub or coastal dune habitats in Monterey County; blooming period July through October	Probable occurrence in undisturbed dune habitats in general vicinity but not observed or expected within project study area boundary.
<i>Eriogonum latifolium</i> # (Coast buckwheat)	na	Common on dunes and coastal areas along the Monterey County shoreline. Species is not protected but is host plant for Smith's blue butterfly. Blooms May through Sept.	Observed within study area and in general vicinity, but not expected to colonize Cemex access road or other project areas.
<i>Eriogonum parvifolium</i> # (Seacliff buckwheat)	na	Common on dunes and coastal areas, especially along the southern Monterey County shoreline and extending inland. Species is not protected but is host plant for Smith's blue butterfly. Blooms May through Sept	Possible occurrence in undisturbed dune habitats in general vicinity but not found or expected within project study area boundary.
<i>Erysimum ammophilum</i> (Coast wallflower)	--/--/1B.2	Chaparral (maritime), coastal dunes, coastal scrub. Sandy openings; blooms February through June.	Known occurrence in dune habitats in general vicinity but not expected within project study area boundary.
<i>Erysimum menziesii</i> ssp. <i>yadonii</i> (Yadon's wallflower)	E/E/1B.1	Very localized variety of species limited in range to Monterey and two other counties; occurs on coastal dunes; blooms March through June.	Known occurrence in dune habitats in general vicinity but not expected within project study area boundary.
<i>Gilia tenuiflora</i> ssp. <i>arenaria</i> (Sand gilia)	E/T/1B.2	Cismontane woodland, maritime chaparral, coastal scrub and dune habitats in Monterey County, in particular bare, wind-sheltered areas near dune summits or hind dunes; blooms April through May.	Known occurrence in dune habitats in general vicinity but not found or expected within project study area boundary.
<i>Horkelia cuneata</i> ssp. <i>sericea</i> (Kellogg's horkelia)	--/--/1B.1	Closed-cone coniferous forest, chaparral, and coastal scrub habitats, old dunes and coastal sand hills; blooms April through September.	Probable occurrence in undisturbed dune habitats in general vicinity but not expected within project study area boundary.
<i>Lupinus</i> spp. (Bush lupines)	# na	Both purple and yellow bush lupines (<i>L. chamissonis</i> & <i>L. arboreus</i>) are common along the Monterey County shoreline; neither is protected. Blooms April through July	Known occurrence in dune habitats in general vicinity but not expected within project study area. Included in Marina LUP because of association with legless lizards (see below).

Table 1 (Cont.): Special Status Species Evaluated for Potential to Occur within the Exploratory Borings Program Package 1 Project Area *

ANIMALS	Status¹ Fed/CA	Habitat	Assessment²
INVERTEBRATES			
<i>Coelus globosus</i> (Globose dune beetle) #	na	Extensive geographic range along coastal California but habitat is restricted to foredunes immediately bordering the sea in open or sparsely vegetated loose sand above the mean high tide line.	Possible occurrence at wrack line and in strand and foredune areas nearby project area. No suitable habitat within project study area, not expected to occur.
<i>Euphilotes enoptes smithi</i> (Smith's blue butterfly)	E/--	Most commonly found in coastal dunes and coastal sage scrub plant communities in Monterey and Santa Cruz counties. Found in association with host plant, <i>Eriogonum latifolium</i> and <i>Eriogonum parvifolium</i> , which are utilized as both larval and adult food plants.	Probable occurrence on coast buckwheat in study area but all buckwheat will be avoided by project.
FISH			
<i>Eucyclogobius newberryi</i> (tidewater goby)	E/CSC	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels	Nearest record is at mouth of Salinas River. Very unlikely to occur in marine environment along Cemex shoreline and will not be affected by project.
AMPHIBIANS / REPTILES			
<i>Rana draytonii</i> (California red-legged frog)	T/CSC	Lowlands and foothills in or near permanent sources of deep water within streams, marshes, and occasionally ponds with dense, shrubby, or emergent riparian vegetation.	Nearest record is at Salinas River; no suitable habitat in project area and will not be affected by project.
<i>Emys marmorata</i> (Western pond turtle)	--/CSC	Requires aquatic habitats with permanent or persistent water and protected areas for basking such as partially submerged rocks or logs, floating vegetation mats or open mud banks.	Nearest record is at Salinas River; no suitable habitat in project area and will not be affected by project.
<i>Anniella pulchra</i> (California legless lizard)	--/CSC	Sandy or loose loamy soils usually in dune substrates with sparse vegetation, especially mock heather & bush lupine. Soil moisture is essential. Black variant found in Monterey and Morro Bay areas.	Probable occurrence in undisturbed dune habitats in general vicinity but not expected in disturbed areas along and in Cemex access road or other project areas.
<i>Phrynosoma coronatum (blainvillii)</i> (Coast horned lizard)	--/CSC	Frequents a wide variety of habitats, mostly common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	Probable occurrence in undisturbed dune habitats in general vicinity but not expected in disturbed areas along and in Cemex access road or other project areas.
BIRDS			
<i>Charadrius alexandrinus nivosus</i> (Western snowy plover)	T/CSC	Federal listing applies to nesting sites of pacific coastal populations only. For nesting, require sandy, gravelly or friable soils that are found on sandy beaches, salt pond levees and shores of large alkali lakes. Winter roosting sites often based on history of use	Known summer nesting and winter roosting habitat nearby project study area.
<i>Athene cunicularia</i> (Burrowing owl)	--/CSC	Ground nester in open dry annual or perennial grasslands, deserts and scrublands with low-growing vegetation, depends on burrowing mammals (i.e. California ground squirrel).	Could occur in sand hills, grasslands and other areas in general vicinity, but no suitable habitat in project study area

Table 1 (Cont.): Special Status Species Evaluated for Potential to Occur within the Exploratory Borings Program Package 1 Project Area *

BIRDS (Cont.)			
<i>Agelaius tricolor</i> (Tricolored blackbird t)	--/CSC	Highly colonial species, most numerous in Central Valley and vicinity, requires open water, protected nesting substrate and foraging area with insect prey within a few km of the colony.	No suitable habitat in project area and will not be affected by project.
<i>Buteo regalis</i> (Ferruginous hawk)	--/--	Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon-juniper habitats. East mostly lagomorphs, ground squirrels and mice. Population trends may follow lagomorph population cycles.	No suitable habitat in project area and will not be affected by project.
<i>Eremophila alpestris actia</i> (California horned lark)	--/--	Coastal regions, chiefly from Sonoma County to San Diego County. Also main part of San Joaquin Valley and east to foothills. Short grass prairie, Bald Hills, mountain meadows, open coastal plains, fallow grain fields, alkali flats.	No suitable habitat in project area and will not be affected by project.
MAMMALS			
<i>Dipodomys heermanni goldmani</i> # (Salinas kangaroo rat)	na	A variety of a common and widespread species known to colonize grasslands, fallow agricultural lands and other upland habitats. Not listed at either the state or federal level.	No suitable habitat in project area and will not be affected by project.
<i>Reithrodontomys megalotis distichlis</i> (Salinas harvest mouse)	--/--	Known only from the Monterey Bay region. Occurs in fresh and brackish water wetlands and probably in the adjacent uplands around the mouth of the Salinas River.	No suitable habitat in project area and will not be affected by project.

1. Status Explanations

Federal (Fed)

E = listed as endangered under the federal Endangered Species Act
 T = listed as threatened under the federal Endangered Species Act
 D = delisted
 -- = no designation

California Native Plant Society (CNPS)

1B = plants considered rare, threatened or endangered in California and elsewhere.
 1B.1 = seriously endangered in CA
 1B.2 = fairly endangered in CA
 1B.3 = not very endangered in CA
 4 = Plants of limited distribution; a watch list
 4.3 = not very threatened in CA

California State (CA)

R = listed as rare under the California Endangered Species Act
 E = listed as endangered under the California Endangered Species Act
 T = listed as threatened under the California Endangered Species Act
 CE – candidate for endangered under the California Endangered Species Act
 CSC = California Department of Fish and Game Species of Special Concern
 -- = no designation

2. Findings based on literature review, field surveys and assessment of habitat types present, and knowledge of species habitat requirements.

*Source: Search of the California Department of Fish and Wildlife's Natural Diversity Database (CDFW 2013) occurrences and the California Native Plant Society's On-line Inventory (CNPS 2013) for the Marina and Moss Landing 7.5-minute USGS quadrangles.

Species listed in City of Marina LUP, Exhibit A, that are otherwise not found in current CNDDDB records.

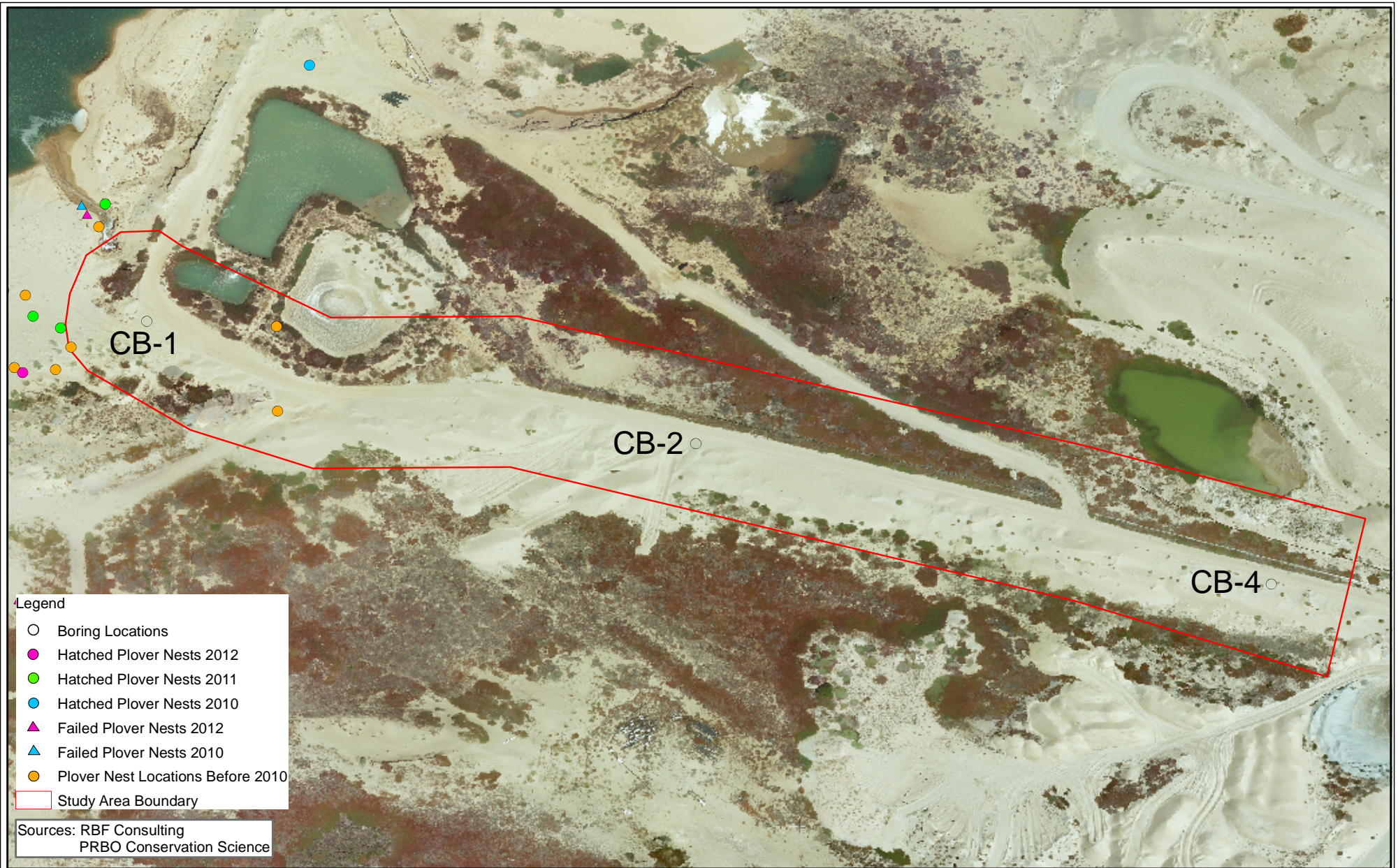
The beach adjacent to the project area has been identified as both important nesting and wintering habitat for the western snowy plover as a result of nearly 30 years of monitoring by PRBO. The most recent nesting data available (2012 nesting season) identified about 38 nesting attempts with 23 successfully hatched along that stretch of beach (PRBO 2012). The nests are typically located between the spring and summer wrack zone and the base of the foredunes. However, some nests have been located around the Cemex pond and adjacent to the portion of the Cemex access road that is within the project study area (Figure 4). The sparsely vegetated foredunes and sand hummocks immediately bordering the sea (typically no more than approximately 50 meters inland from the mean high tide line) provide habitat for the globose dune beetle but there is no suitable habitat for globose dune beetle within the project study area.

Potential Impacts

The project has been designed to avoid or minimize impacts on special status species; it has been sited completely within previously disturbed areas and away from the coastal dunes, strand and shoreline habitats. However, activities associated with the work could result in direct or indirect effects on Monterey spineflower or nesting western snowy plovers. The potential effects of the project on special status species known to occur in the area and designated critical habitat for one of them are discussed in more detail below. Measures that will be incorporated into the project to minimize and mitigate these effects are discussed in the following section.

Potential Effects on Special Status Plants: The Exploratory Borings Package 1 Project is not expected to adversely affect any special status plants. The only special status plant species known to occur in the project study area is Monterey spineflower. All of the other plant species listed in Table 1 are typically found in relatively undisturbed dune habitats and none were observed or are expected to occur within the project study area. Monterey spineflower was found scattered throughout bare sand areas adjacent to the access road but not within the active roadbed. In order to avoid direct effects on Monterey spineflower, the work areas for each of the three proposed boring locations will need to be sited outside of occupied habitat. While there may be some limited potential for seed bank disturbance for Monterey spineflower, this effect would be minimal in the context of ongoing operational activities at the Cemex facility. Minimization and mitigation measures identified below are intended to reduce the potential for any effects on Monterey spineflower.

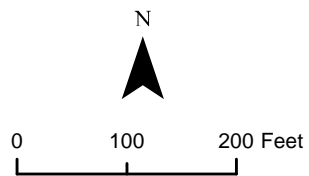
Potential Effects on Special Status Animals: Only four of the special status animal species listed in Table 1 potentially occur within the project area. These species include Smith's blue butterfly, California legless lizard, coast horned lizard and western snowy plover. Other special status animal species with occurrence records within a three mile radius can be dismissed based on the habitat characteristics in the project area, location of project facilities, operational procedures and other factors (see Table 1). Following is an assessment of potential project impacts on each of the four animal species known, or with some potential, to occur in the study area.



- Legend**
- Boring Locations
 - Hatched Plover Nests 2012
 - Hatched Plover Nests 2011
 - Hatched Plover Nests 2010
 - ▲ Failed Plover Nests 2012
 - ▲ Failed Plover Nests 2010
 - Plover Nest Locations Before 2010
 - Study Area Boundary

Sources: RBF Consulting
PRBO Conservation Science

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Special Status Species Locations
MPWSP
Exploratory Borings, Package 1
Marina, California

Figure
4

- **Smith's blue butterfly:** Drilling operations are proposed to occur in summer, within the flight season for Smith's blue butterfly. However, direct (e.g. windshield hits) or indirect (e.g. dust on the nectaries of buckwheat foodplants) impacts on adult butterflies are not expected to occur for the following reasons. The majority of buckwheat plants were found north of the access road. Butterflies that may be using these plants are likely to move about in that general vicinity; not necessarily crossing the road in large numbers. The drill rig is track-mounted and will move slowly along the access road to reach each boring location, thereby reducing the potential for windshield hits and minimizing fugitive dust. Because all project-related activities would occur in previously disturbed areas where buckwheat plants were not found, the potential for disturbance in close proximity to the butterfly's hostplant would be very low. Minimization and mitigation measures identified below are intended to reduce the potential for any effects on Smith's blue butterfly.
- **California legless lizard:** This fossorial (burrowing) species can be found in a number of habitats in dunes and sandy areas, from immediately above high tide, the crest of sand dunes, and the edge of the hind dunes to inland sandy areas associated with oak woodlands, grasslands, maritime chaparral and other habitats. Legless lizards burrow in sand and leaf litter beneath plants growing in these habitats and feed on insects and other invertebrates; some plant cover is required to support insects that, in turn, serve as food for the lizards. Because dune habitats with native vegetation will be avoided by the project, no adverse impacts on legless lizards are expected. Minimization and mitigation measures identified below are intended to reduce the potential for any effects on legless lizards.
- **Coast horned lizard:** Coast horned lizards inhabit open country, especially sandy areas, washes, flood plains, and wind-blown deposits in a wide variety of habitats, including coastal dunes, shrublands, woodlands, riparian habitats and annual grassland. Warm, sunny, open areas with sparse vegetation are primary habitat requirements, along with patches of loose soil where the lizard can bury itself. The disturbed, compacted and unvegetated roadbed through the Cemex facility does not provide suitable habitat for the coast horned lizard. Minimization and mitigation measures identified below are intended to reduce the potential for any effects on coast horned lizards.
- **Western snowy plover:** Because drilling operations are proposed within the plover's nesting season, there is some potential for direct effects on nesting habitat, primarily for boring location CB-1. The other two borings – CB-2 and CB-4 – are far enough inland and out of line of sight from nests that direct or indirect effects on plover nesting habitat are not expected to occur. Since CB-1 will be located at the west end of the access road, nearby plover nesting habitat, drilling operations could disrupt active nesting activities if they occur in close proximity to the drill site. The minimization and mitigation measures identified below are intended to reduce the potential for project-related effects on snowy plover nesting habitat.

Potential Effects on Critical Habitat: The potential effects on designated critical habitat for Monterey spineflower are discussed below.

- **Monterey spineflower:** The Federal Register listing notice for Monterey spineflower critical habitat (73 FR 1525) defines activities that may destroy or adversely modify

critical habitat as those that alter the essential physical and biological features to an extent that appreciably reduces the conservation value of critical habitat for Monterey spineflower. It identifies such activities as (1) actions that would degrade or destroy native maritime chaparral, dune, and oak woodland communities, including, but not limited to, livestock grazing, clearing, disking, introducing or encouraging the spread of nonnative plants, and heavy recreational use; and (2) actions that would appreciably diminish habitat value or quality through indirect effects (e.g., edge effects, invasion of nonnative plants or animals, or fragmentation).

All project-related activities would occur in previously disturbed areas that are not essential for Monterey spineflower. The project would not cause the degradation or destruction of native dune communities in the vicinity because access through these areas would follow an existing road currently used by Cemex.⁴ The project is also not expected to diminish the value of the dune habitat such that it would preclude maintenance or establishment of Monterey spineflower plants. Consequently, the project would not destroy or adversely modify critical habitat for Monterey spineflower.

Minimization and Mitigation Measures

Monterey spineflower: The following measures are intended to avoid or further minimize and mitigate potential impacts to Monterey spineflower that may occur in the study area.

- ***Pre-construction surveys:*** A qualified biologist will conduct a survey with the appropriate project team members prior to equipment mobilization to identify and mark the work areas for each of the three borings to assure that no Monterey spineflower will be disturbed. Monterey spineflower occurrences within 20 feet of the access road and perimeters of the work areas will be identified and marked.
- ***Habitat avoidance:*** The designated work area for each boring will be clearly delineated with rope line or fencing and project activities will be restricted to that specific area. Access to the work areas will be along the existing Cemex access road. Where Monterey spineflower occurs within 20 feet of the access road, the biologist will establish appropriate buffers and access procedures for the drilling operations (see below).
- ***Biological resource education and monitoring:*** Prior to mobilization of equipment or initiation of drilling operations, a qualified biologist would be designated to conduct an educational training session regarding Monterey spineflower with all construction personnel. The training would include a description of the plant and its habitat preferences with onsite identification and/or illustrations. The biologist would also monitor equipment access in order to avoid disturbance to areas that support or could support Monterey spineflower as identified through the pre-construction surveys (see above).

Smith's blue butterfly: The following measures are intended to avoid or further minimize potential impacts to Smith's blue butterfly in the study area.

- ***Pre-construction surveys:*** A qualified biologist will conduct a survey with the appropriate project team members prior to equipment mobilization to identify and mark the work areas for each of the three borings to assure that no buckwheat plants will be

⁴ The Final Rule designating critical habitat for spineflower specifically excludes manmade structures (such as buildings, aqueducts, airports, and roads) and the land on which such structures are located.

disturbed. Buckwheat occurrences within 20 feet of the access road and work areas will also be identified and marked as necessary.

- **Avoidance of buckwheat:** Buckwheat plants or clusters of plants, as identified and marked by a qualified biologist (see above), would be avoided by the project. The biologist would establish appropriate buffers and access procedures for any buckwheat plants occurring within 20 feet of the existing access road, which would be monitored during drilling operations (see below).
- **Biological resource education and monitoring:** Prior to mobilization of equipment or initiation of drilling operations, a qualified biologist would be designated to conduct an educational training session regarding Smith's blue butterfly with all construction personnel. The training would include a description of the butterfly's life cycle and habitat preferences and identification of buckwheat along the access road. The biologist would also monitor equipment access in order to avoid disturbance to buckwheat plants or encroachment into areas supporting buckwheat.

California legless lizard: The following measures are intended to avoid or further minimize and mitigate potential impacts to California legless lizard in the study area.

- **Habitat avoidance:** Areas potentially suitable to support legless lizards, especially areas of sparsely vegetated loose sand with bush lupines, mock heather and other dune shrubs, would be avoided by the project. In the event that any such areas occur within 20 feet of the existing access road or boring locations, a qualified biologist would establish appropriate buffers and access procedures, which would be monitored during the term of the project (see below).
- **Biological resource education and monitoring:** Prior to mobilization of equipment or initiation of drilling operations, a qualified biologist would be designated to conduct an educational training session regarding the legless lizard with all construction personnel. The training would include a description of the lizard's life cycle and habitat preferences, illustrations of the species and identification of potentially suitable habitat. The biologist would also monitor equipment access in order to avoid disturbance to potentially suitable habitats or encroachment into areas potentially supporting the legless lizard.

Coast horned lizard: The following measures are intended to avoid or further minimize and mitigate potential impacts to coast horned lizard in the study area.

- **Habitat avoidance:** Areas potentially suitable to support coast horned lizards, especially areas of sparsely vegetated loose sand with native dune shrubs, would be avoided by the project. In the event that any such areas occur within 20 feet of the existing access road or boring locations, a qualified biologist would establish appropriate buffers and access procedures, which would be monitored during the term of the project (see below).
- **Biological resource education and monitoring:** Prior to mobilization of equipment or initiation of drilling operations, a qualified biologist would be designated to conduct an educational training session regarding the coast horned lizard with all construction personnel. The training would include a description of the lizard's life cycle and habitat preferences and identification of potentially suitable habitat areas. The biologist would also monitor equipment access in order to avoid disturbance to potentially suitable habitats or encroachment into areas potentially supporting the coast horned lizard.

Western Snowy Plover: The following measures are intended to avoid or further minimize and mitigate potential impacts to western snowy plover in the study area.

- **Pre-drilling evaluation:** A qualified biologist will be present prior to and during drill rig setup to stake off the work areas with the drilling contractor to ensure that drilling activities avoid any impacts to nesting plovers. Prior to initiation of drilling operations at boring location CB-1, the biologist will coordinate with PRBO and review current (June-July-August 2013) nest monitoring data to determine the location and status of active nests and broods within 200 feet of the western end of the Cemex access road.
- **Avoidance of Nesting Disturbance:** If the biologist and PRBO determine that there are active nests in close enough proximity to CB-1 at the proposed time of drilling that they could be disturbed by drilling operations, then the nesting activity will be monitored and drilling at CB-1 would not commence until the young in those nests have fledged and/or nesting has not been reinitiated in the area. If adults and chicks are still using the area late into the summer, drilling of CB-1 may not occur until the official end of the nesting season (October 1st). Also, the contractor may be directed to install noise blankets at CB-1 as determined necessary by the biologist. The decisions to allow drilling operations to commence at boring location CB-1 prior to the end of the nesting season and determination of any further minimization measures would be made in consultation with the USFWS.
- **Project operation limits:** Drilling activities would be restricted to the designated work areas and access route. No construction equipment, materials, or activity would occur outside of these work areas.
- **Trash management:** Construction personnel would keep all food-related trash items in sealed containers and remove them daily from the work areas to discourage the concentration of potential predators in snowy plover habitat.
- **Biological resource monitoring and education:** Prior to mobilization of equipment or initiation of drilling operations, a qualified biologist would conduct an educational session with all construction personnel to describe snowy plover nesting behavior, habitat preferences, threats and other issues. The biologist would also monitor equipment access and drilling operations to assure avoidance of active nesting areas or encroachment into areas potentially used by snowy plovers.

Conclusion

The Exploratory Borings, Package 1 project would occur adjacent to an area of coastal dune, strand and shoreline habitat known to support several special status species of plants and animals and within designated critical habitat for one federally listed species. However, the specific locations of project activities were selected to avoid or minimize impacts to sensitive habitats and special status species. All proposed boring locations occur in previously disturbed areas. The proposed schedule for the drilling operation (July or August) would fall within the growing season for Monterey spineflower and the nesting period for western snowy plover. Reasonable and prudent minimization and mitigation measures have been incorporated into the siting and operation of the project.

The proposed project is not expected to affect any of the special status plants under consideration herein or adversely modify critical habitat for Monterey spineflower. Similarly, the proposed

project is not expected to affect Smith's blue butterfly, California legless lizard or coast horned lizard, primarily because the habitats of these animals will be avoided.

Impacts to nesting habitat for the western snowy plover would be avoided with implementation of all the minimization and mitigation measures proposed above. Therefore, the project is not likely to result in significant effects on the western snowy plover or appreciably diminish the value or quality of its habitat.

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