Return to Agenda

DRAFT INITIAL STUDY/
MITIGATED NEGATIVE DECLARATION

for the

A1/A2 RESERVOIRS &
B/C ZONES BOOSTER PUMP STATION PROJECT

Prepared for:

Marina Coast Water District

11 Reservation Road

Marina, CA 93933-2099

Prepared by:

Denise Duffy & Associates

947 Cass Street, Suite 5

Monterey, CA 93940

January 2021

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1. BACKGROUND INFORMATION

1. **Project Title**: A1/A2 Reservoirs and B/C Zones Booster Pump Station Project

2. **Lead Agency/Project Proponent Name and Address:** Marina Coast Water District (MCWD or District), 11 Reservation Road, Marina, CA 93933

3. **Contact Person & Phone Number**: Michael Wegley, MCWD District Engineer, (831) 883-5925

4 **Project Location:** The proposed project is located at three distinct project locations within the City of Marina (City) limits on the former Fort Ord in Monterey County, California. These locations are as follows:

- The two proposed A1/A2 Reservoirs (reservoirs) and B/C Zones Booster Pump Station (B/C BPS) would be located within a 1.6-acre easement on the California State University Monterey Bay (CSUMB) campus. The project site is situated on an existing paved parking lot on Assessor's Parcel Number (APN) 031-101-033-000 near 8th Street and 6th Avenue, east of the City's Public Works Corporation Yard. There is an additional 0.59-acre pipeline easement at this location, which connects the north end of the facility easement to 6th Avenue.

- The Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building are co-located on a 0.63-acre easement along Old County Road. The 24-inch wellfield pipeline is located within a 15-foot (ft) wide easement owned by the MCWD.

- The existing B/C BPS is located within the Sea Haven (formerly Marina Heights) Specific Plan Area on 3.79-acre easement southeast of the intersection of California Avenue and Marina Heights Drive on APN 031-271-010-000 (owned by the City). A portion of the project is also located within the Imjin Parkway right-of-way.

5. **Project Summary**: As part of the MCWD's 2006 Marina Water System Master Plan (2006 Master Plan) and 2020 Water Master Plan (2020 Master Plan), the proposed project involves the relocation and replacement of the existing B/C BPS and Sand Tank with a new B/C BPS and two new A1/A2 Reservoirs. The purpose of the proposed A1/A2 Reservoirs is to provide operational, fire, and emergency water storage for Zone A in Ord Community and Central Marina service areas. In addition, the project proposes various associated infrastructure improvements at the Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building. The proposed project would include two new potable water storage tanks (reservoirs) and a new B/C BPS to pump water from the new storage tanks to the existing B and C pressure zone reservoirs and distribution system. A portion of the C-Zone transmission main from the existing BPS would be converted to an A-Zone transmission main to supply the new reservoirs. This would require adding a new pipeline in Imjin Parkway and adjusting valves at the existing pump station to connect the wellfield transmission mains to the C-Zone transmission main.

The project also proposes various improvements at the existing Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building. The project proposes to update the Supervisory Control and Data Acquisition (SCADA) system, replace the altitude valve, replace the emergency generator, and recoat the Intermediate Reservoir. Improvements to the Ord Community

wellfield disinfection system at the Chlorination Building include adding a flow meter on the wellfield main and variable speed drives on the dosing pumps.

The existing B/C BPS is centrally located on the former Fort Ord and multiple pipelines radiate out from the B/C BPS site. The two 16-inch pipelines that connect the wellfield to the BPS converge at the Bermad valve, which is located outside the BPS easement. These wellfield pipelines are planned to be replaced in the future with a 24-inch pipeline located within California Avenue and Imjin Parkway.

6. Land Use Designations: The City's General Plan designates the proposed project areas as follows:

- Proposed A1/A2 Reservoirs and B/C BPS site: Public Facilities with a small portion designated as Parks and Recreation;
- Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building: Habitat Preserve and Other Open Space; and,
- Existing B/C BPS site: Parks and Recreation.

While within city limits, a portion of the proposed A1/A2 Reservoirs and B/C BPS site is located on the CSUMB campus, and the 2007 Campus Master Plan designates the site as Surface Parking. The Draft Campus Master Plan Update (2017) proposes converting the area from surface parking to student housing.

2. PROJECT SUMMARY

2.1 INTRODUCTION

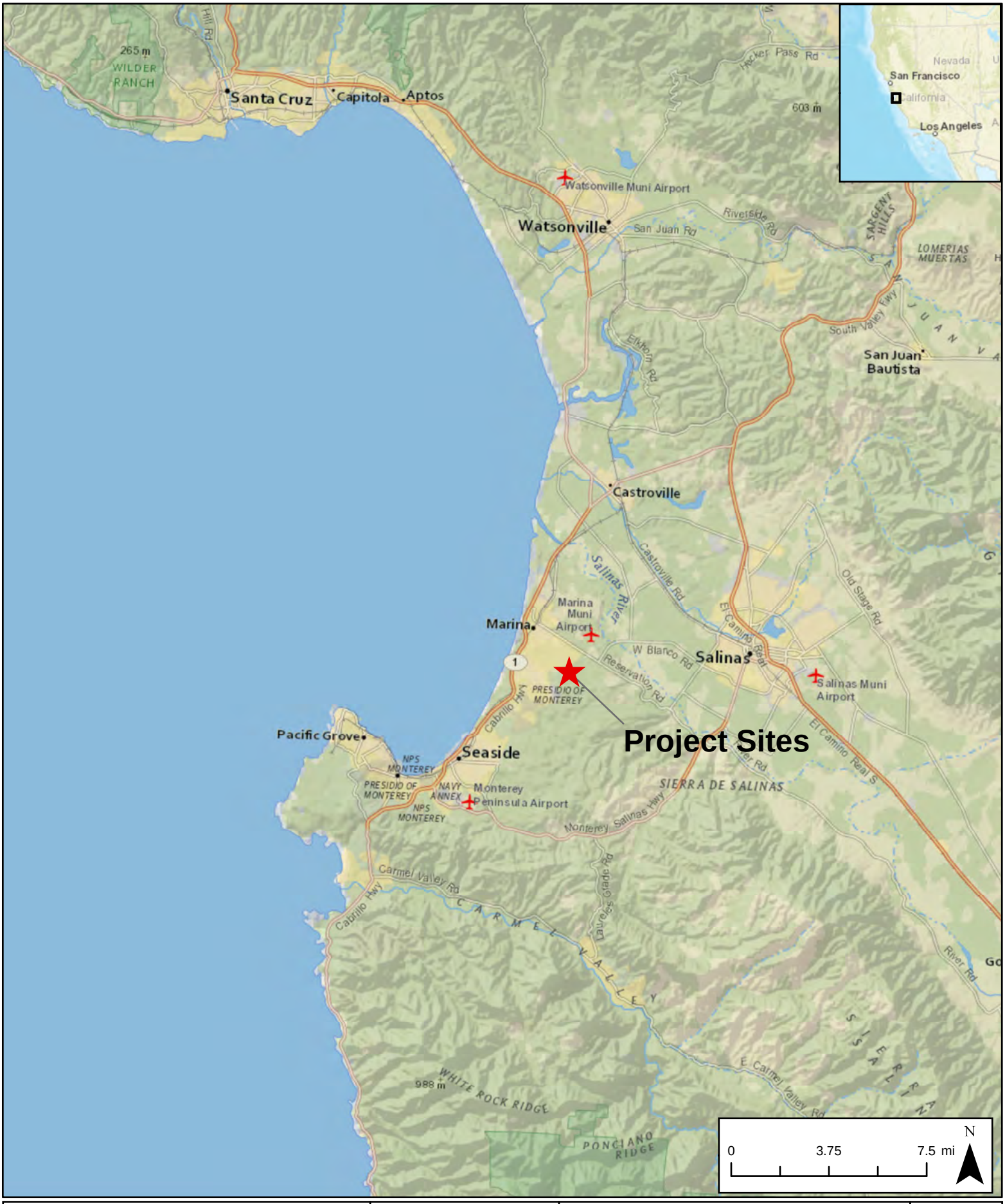
This Initial Study has been prepared to evaluate the potential environmental effects associated with the A1/A2 Reservoirs and B/C BPS Project (project or proposed project), located on the former Fort Ord in the City of Marina, Monterey County, California (**Figure 1**). This document has been prepared in accordance with the California Environmental Quality Act (CEQA), Public Resources Code §21000 et. seq., and the State CEQA Guidelines, California Code of Regulations (CCR) §15000 et. seq.

An Initial Study is an informational document prepared by a lead agency to determine if a project may have a significant effect on the environment (CEQA Guidelines §15063, subd. (a)). If there is substantial evidence that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) must be prepared, in accordance with CEQA Guidelines §15064(a). However, if the lead agency determines that revisions in the project plans or proposals made by, or agreed to by, the applicant mitigate the potentially significant effects to a less-than-significant level, a Negative Declaration (ND) or Mitigated Negative Declaration (MND) may be prepared instead of an EIR (CEQA Guidelines §15070, subd. (b)). The lead agency prepares a written statement describing the reasons a proposed project would not have a significant effect on the environment and, therefore, why an EIR need not be prepared. This Initial Study conforms to the content requirements under CEQA Guidelines §15071.

The MCWD (or District) is acting as the lead agency pursuant to CEQA Guidelines §15050(a). The District is a special district, established in 1960, that provides potable water and wastewater collection services to the City and the former Fort Ord. MCWD serves approximately 33,000 residents through 10,000 connections (LAFCO, 2019). As the lead agency, the District prepared an Initial Study pursuant to CEQA Guidelines §15063, §15070, and §15152.

This document will also serve as a basis for soliciting comments and input from members of the public and public agencies regarding the proposed project. This Initial Study will be circulated for agency and public review during a 30-day public review period pursuant to CEQA Guidelines §15073. During the public review period comments concerning the analysis contained in the Draft IS/MND should be sent to: Mike Wegley, MCWD, 11 Reservation Road, Marina, CA 93933; or via email at MWegley@mcwd.org or facsimile at (831) 883-5995. Comments received by the District on the Initial Study will be reviewed and considered as part of the deliberative process in accordance with CEQA Guidelines §15074.

The following section is consistent with the requirements of CEQA Guidelines §15124 to the extent that it is applicable to the project. This section contains a detailed description of the historical background and context, project location, project components and relevant project characteristics, project goals and objectives, and applicable regulatory requirements.



Title: **Regional Map**	Date: 9/15/2020 Scale: 1 inch = 5 miles Project: 2019-20	Monterey | San Jose **Denise Duffy and Associates, Inc.** Environmental Consultants Resource Planners 947 Cass Street, Suite 5 Monterey, CA 93940 (831) 373-4341	Figure 1

D:\GIS\GIS_Projects\2019-20 A-Tanks Botanical Surveys\IS Maps\Final\Regional Project Map.mxd

2.2 PROJECT BACKGROUND

The MCWD is a County Water District organized and operating under the County Water District Law, Water Code §30000. The MCWD is located on the coast of Monterey Bay at the northwest end of the Salinas Valley and occupies a service area of about 4.5 square miles. The District was formed in 1960 and provides potable water, wastewater collection, and reclaimed water services within the City of Marina and the Ord Community, located on the former Fort Ord military base. In 1992, the District joined Monterey One Water (M1W) (formerly the Monterey Regional Water Pollution Control Agency) and connected to the Regional Treatment Plant. In 2018, the District conveyed approximately 2,200 acre-feet of sewage to M1W for treatment.

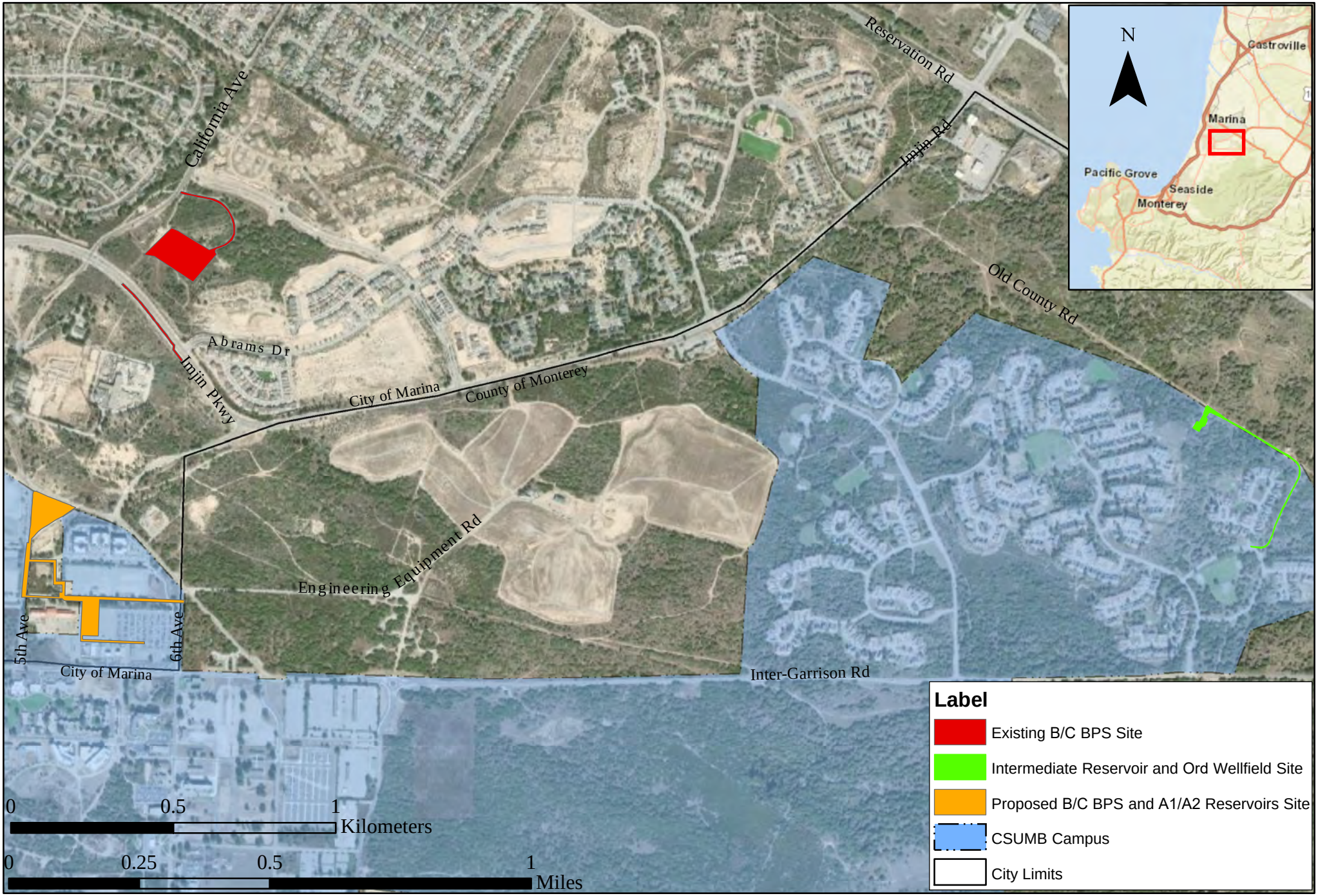
In 2006, the MCWD prepared the 2006 Marina Water System Master Plan (2006 Master Plan) that identified capacity deficiencies in the existing water system and recommended improvements to alleviate existing deficiencies and serve future developments. The MCWD prepared another Water System Master Plan in 2020 (2020 Master Plan), updating the 2006 Master Plan, to plan for future domestic water system infrastructure for the projected buildout of the MCWD. The MCWD's 2020 Master Plan identifies several capital improvement projects needed in the immediate future, including the proposed project. The purpose of the proposed A1/A2 Reservoirs is to provide operational, fire, and emergency water storage for Zone A in the former Fort Ord community and Central Marina. Currently, Zone A in the former Fort Ord has no storage and is fed from Zone B through pressure reducing stations. Zone A in Central Marina has minimal gravity storage from the existing Intermediate Reservoir located in the former Fort Ord. Reservoir 2 in Central Marina sits below the hydraulic grade line (HGL) of Zone A, and, thus, requires a booster pump station to feed the distribution system.

2.3 PROJECT LOCATION

The proposed project, described below, is located at three distinct locations on the former Fort Ord within the City of Marina, in Monterey County, California (**Figure 2**). Photos of the project sites are provided in **Figures 3a** and **3b**, and further described as follows:

Proposed A1/A2 Reservoirs And B/C BPS

The proposed new reservoirs and BPS would be located within a 1.6-acre easement on the CSUMB campus, in an existing paved parking lot (APN 031-101-033-000). The site is immediately east of the City's Public Works Corporation Yard (APN 031-101-038-000). The site is generally flat and paved, except for the northern end, which contains a vegetated slope with eucalyptus and pine trees, sloping down to a lower paved lot (outside the easement limit). A gravel road running east-west once existed (now overgrown) approximately one quarter of the way up the slope, at elevation 187 feet North American Vertical Datum (NAVD). There is an additional 0.59-acre pipeline easement, connecting the north end of the 1.6-acre easement to 6th Avenue. This site is bounded to the north by a vacant paved parking lot with student housing (CSUMB Promontory) located immediately beyond, to the east by open space, the CSUMB Visual and Public Art Center and Inter-Garrison road to the south, and the City's Corp Yard to the west.



Title:

Project Location Map

Date: 12/9/2020

Scale: 1 inch = 1,000 feet

Project: 2019-20

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Figure 2

View of south side of proposed A1/A2 Reservoirs and B/C BPS site, looking west.

View of north side of proposed A1/A2 Reservoirs and B/C BPS site, looking west.

View of vegetation along middle of the proposed A1/A2 Reservoirs and B/C BPS site, looking west.

Title:

Site Photos

Date 12/14/2020

Scale N/A

Project 2019-20

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Figure

3a

View of existing Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Site, looking south.

View of existing Intermediate Reservoir and surrounding vegetation, looking north.

View of existing B/C BPS, looking west.

View of existing Sand Tank, looking west.

Title:

Site Photos

Date	12/14/2020
Scale	N/A
Project	2019-20

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Figure

3b

Regional access to the A1/A2 Reservoirs and B/C BPS site is provided from State Route (SR) 1 onto Imjin Parkway and then to California (5th) Avenue. The site is located north of Inter-Garrison Road between 5th and 6th Avenues, and south of 8th Street.

Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building

The Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building are co-located on a 0.63-acre easement along Old County Road. The site is surrounded on the north and east by open space, and on the south and west by residential development (CSUMB housing). The City's General Plan designates the parcel as Habitat Preserve and Other Open Space.[1] Regional access to this site is provided from Reservation Road onto Imjin Parkway, which intersects Old County Road. District Operator access is from Wainwright Drive via a driveway easement.

Existing B/C BPS

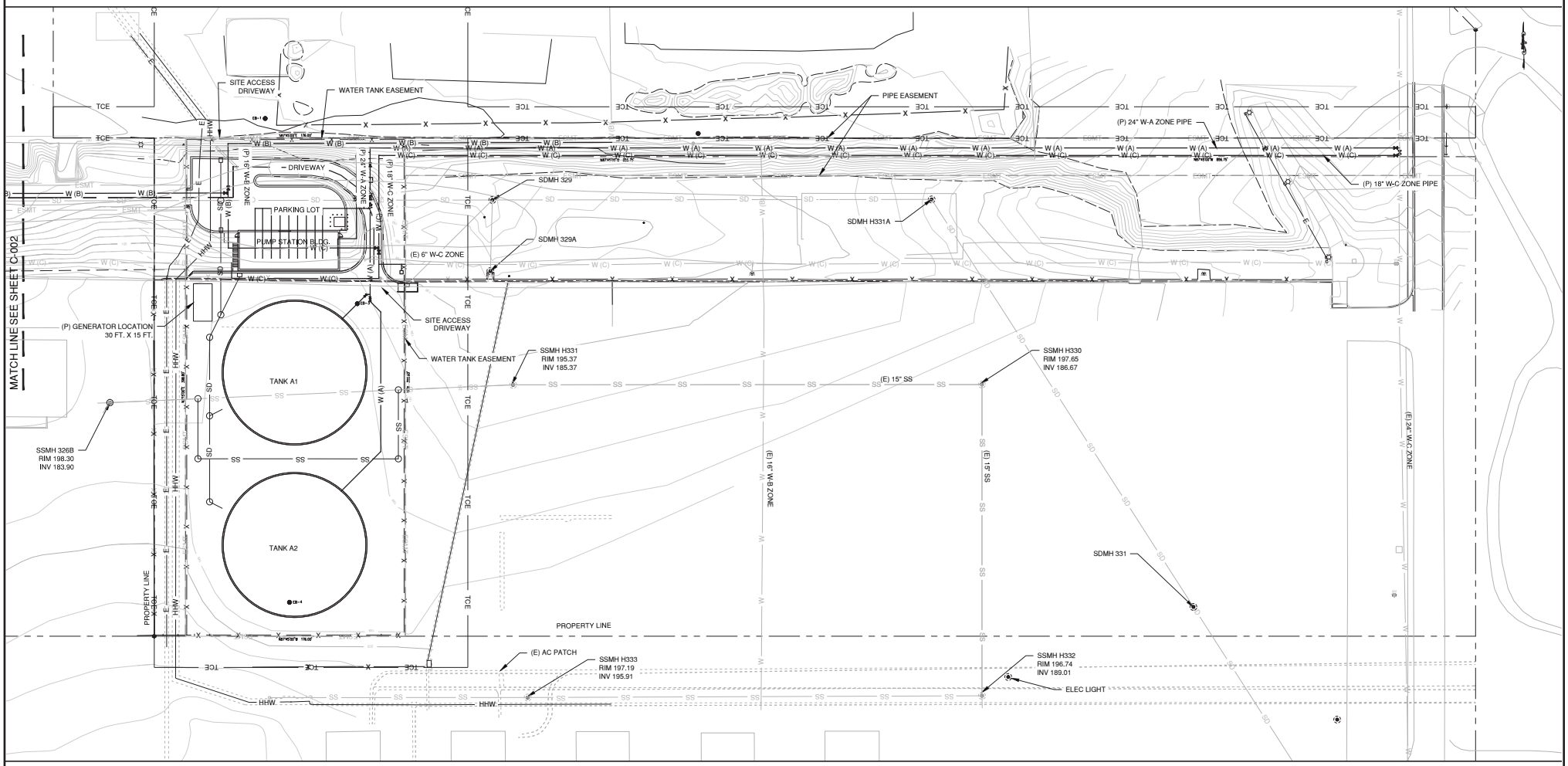
The existing B/C BPS is located on the former Fort Ord within the Sea Haven Specific Plan Area (formerly Marina Heights) on a 3.79-acre easement southeast of the intersection of California Avenue and Marina Heights Drive on APN 031-271-010-000 (owned by the City). The site is a partially developed parcel consisting of the existing B/C BPS, Sand Tank, and associated infrastructure surrounded by vegetation and various tree species. The site is bordered by residential development to the north and east, Imjin Parkway to the south, and California Avenue and residential development to the west. The site is designated by the City's General Plan as Parks and Recreation. Regional access to this site is provided from SR 1 or Reservation Road onto Imjin Parkway or California Avenue.

2.4 PROJECT DESCRIPTION

Overview

As identified in the 2006 and 2020 Master Plans, the proposed additional storage and associated improvements are necessary to meet the future demand of the former Fort Ord Community. The proposed project would include the construction of a new B/C BPS and two A1/A2 reservoirs (**Figure 4**). The new B/C BPS would pump water from the A1/A2 Reservoirs to the existing B and C pressure zone reservoirs and distribution system. The station would have a capacity of 3,300 gallons per minute (gpm) to Zone B and 6,000 gpm to Zone C, with one redundant pump for each zone. A portion of the C-Zone transmission main from the existing BPS would be converted to an A-Zone transmission main to supply the new reservoirs. This would require adding a new pipeline in Imjin Parkway and adjusting valves at the existing pump station to connect the wellfield transmission mains to the C-Zone transmission main. The existing diesel-electric emergency generator will be relocated from the existing B/C BPS to the new BPS site. The proposed project would also include an upgrade to the existing Ord Wellfield disinfection system, consisting of adding a flow meter upstream of the current dosing location, adding a residual chlorine analyzer downstream of the dosing location, and modifying the dosing pumps and controller inside the existing building (**Figure 5**). An enlarged site plan and elevations are shown on **Figures 6** and **7**, respectively.

[1] The Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building site is located within the unincorporated County, with the wellfield pipeline on University of California property and tank and fenced yard on CSUMB property. However, the site is within the City's Sphere of Influence and, therefore, considered within the City's jurisdiction.



NOTE:
COORDINATE HAUL ROADS, WORK/STORAGE AREA, AND PARKING WITH CSUMB.

Source: Schaaf & Wheeler, December 2020

Title: A1/A2 Reservoirs and B/C BPS Site Plan

Date 4/27/2020
Scale 1"=40'
Project 2019.20

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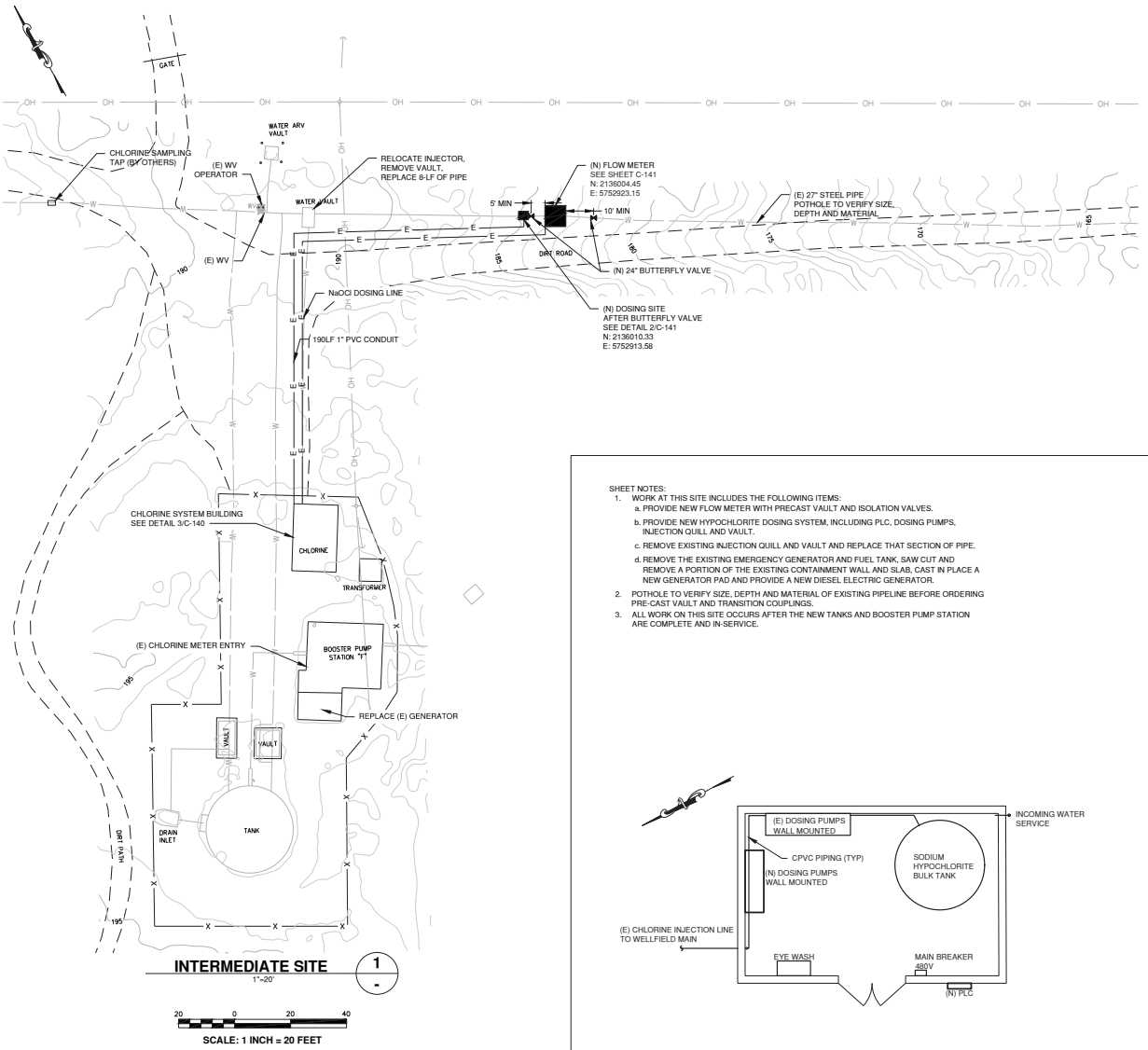
Figure 4



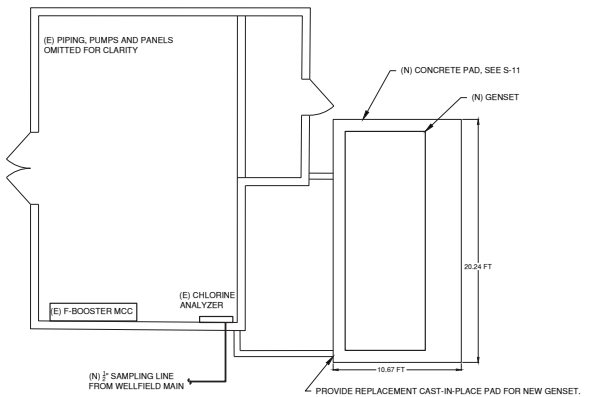
INTERMEDIATE SITE 1
1"=20'

SHEET NOTES:

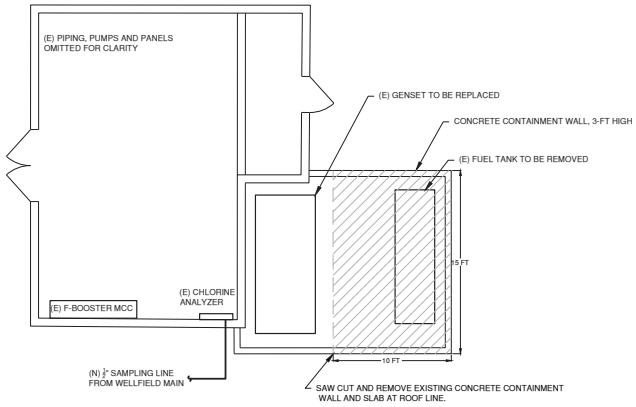
1. WORK AT THIS SITE INCLUDES THE FOLLOWING ITEMS:
   a. PROVIDE NEW FLOW METER WITH PRECAST VAULT AND ISOLATION VALVES.
   b. PROVIDE NEW HYPOCHLORITE DOSING SYSTEM, INCLUDING PLC, DOSING PUMPS, INJECTION QUILL AND VAULT.
   c. REMOVE EXISTING INJECTION QUILL AND VAULT AND REPLACE THAT SECTION OF PIPE.
   d. REMOVE THE EXISTING EMERGENCY GENERATOR AND FUEL TANK, SAW CUT AND REMOVE A PORTION OF THE EXISTING CONTAINMENT WALL AND SLAB, CAST IN PLACE A NEW GENERATOR PAD AND PROVIDE A NEW DIESEL ELECTRIC GENERATOR.
2. POTHOLE TO VERIFY SIZE, DEPTH AND MATERIAL OF EXISTING PIPELINE BEFORE ORDERING PRE-CAST VAULT AND TRANSITION COUPLINGS.
3. ALL WORK ON THIS SITE OCCURS AFTER THE NEW TANKS AND BOOSTER PUMP STATION ARE COMPLETE AND IN-SERVICE.

1. LOCATIONS APPROXIMATE. ADJUST EQUIPMENT LAYOUT AS NEEDED.
2. PROVIDE (N) CONDUIT AND INJECTION LINE FROM BUILDING TO INJECTION VAULT.

CHLORINATION SYSTEM 3
NTS



F BOOSTER GENSET 5
NTS



F BOOSTER DEMO 4
NTS

Source: Schaaf & Wheeler, December 2020

Title: # Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Site Plan

Date 1/4/2021
Scale 1"=20"
Project 2019.20

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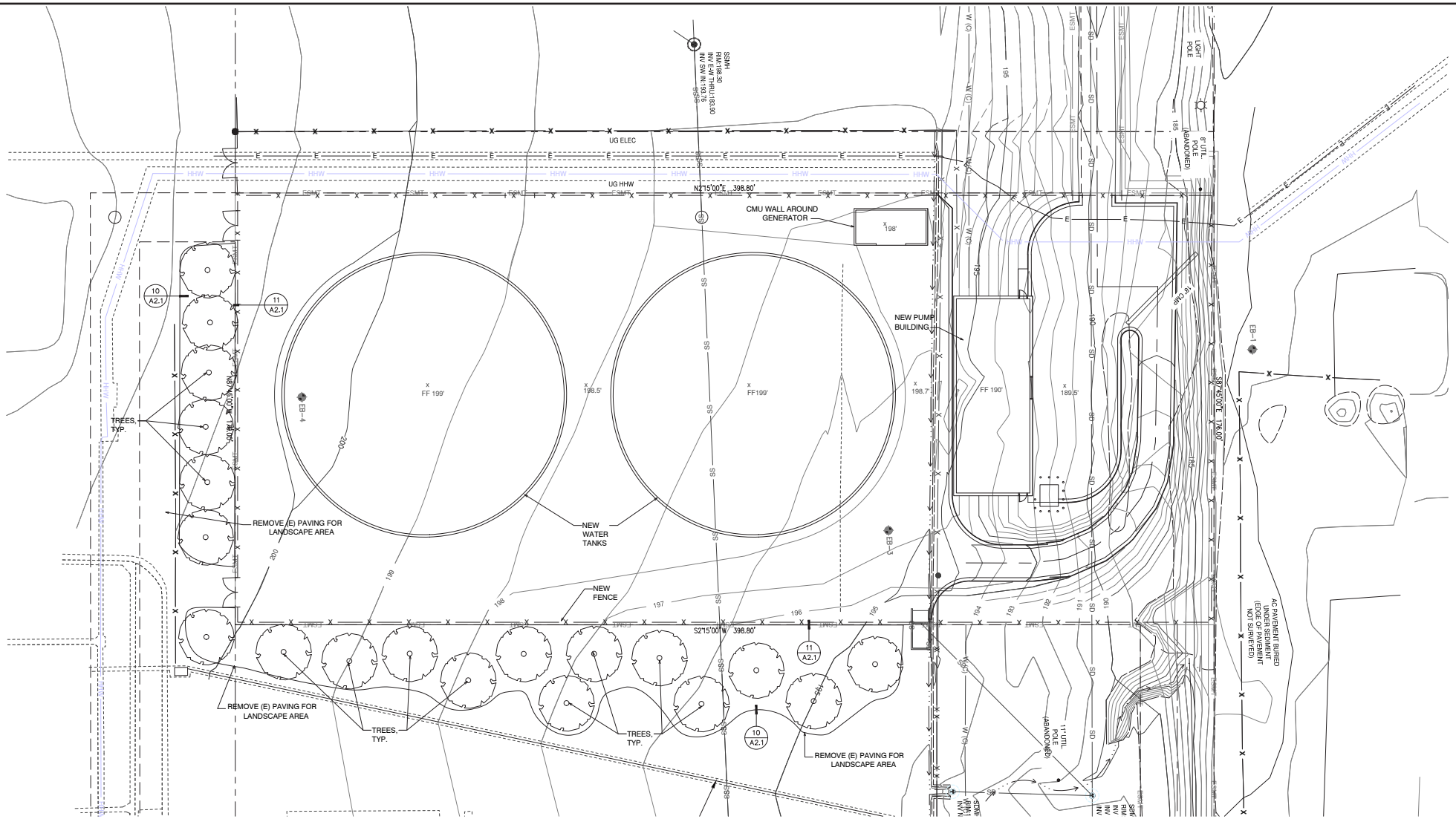
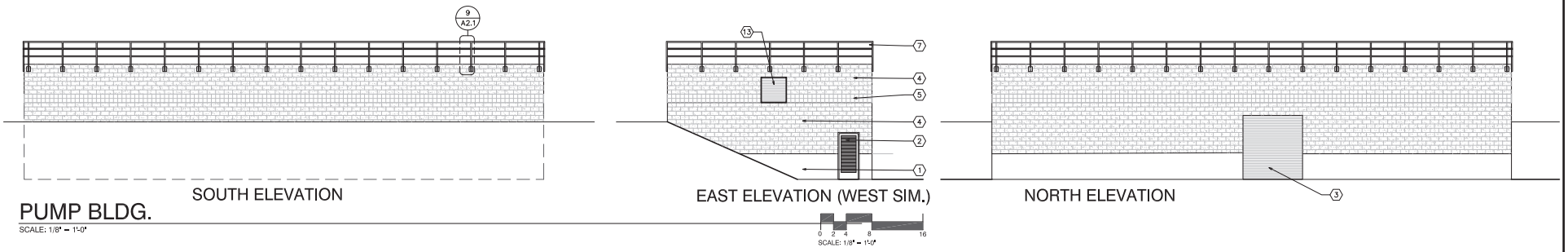
Figure 5



Source: The Paul Davis Partnership, LLP, December 2020

Title: A1/A2 Reservoirs and B/C BPS Conceptual Site Plan	Date 1/4/2021 Scale 1"=20' Project 2019.20	Monterey | San Jose **Denise Duffy and Associates, Inc.** Environmental Consultants Resource Planners 947 Cass Street, Suite 5 Monterey, CA 93940 (831) 373-4341	Figure 6



SPLIT-FACE COLOR OPTIONS

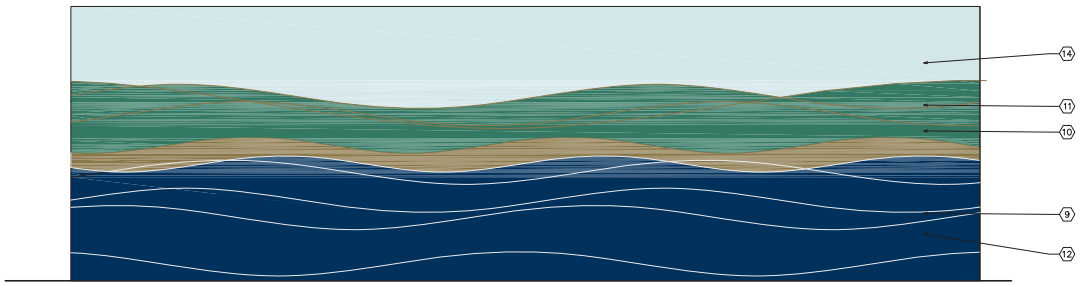
NATURAL GRAY LW SPLIT-FACE (ORCO or equal)

PORTOLA MW -SPLIT-FACE (ORCO or equal)

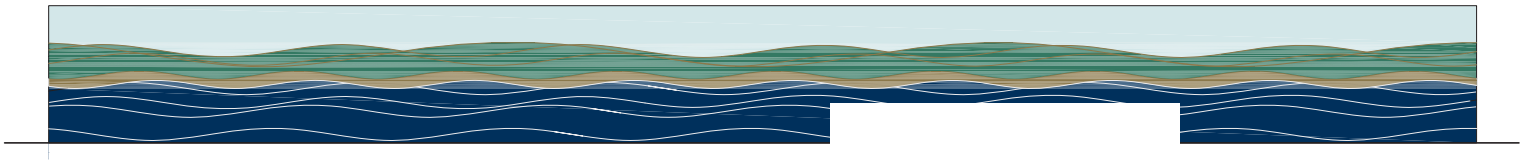
SHEET NOTES

1. CONCRETE
2. PAINTED HM DOOR WITH LOUVERS
3. PAINTED ROLLUP DOOR
4. CMU WALL- 8 x 16 SPLIT FACED, TAN COLORED
5. CMU WALL- 8 x 16 SINGLE SCORED, GROUND TEXTURE
6. -
7. METAL GUARD RAIL - SEE 9/A2.1 & STRUCTURAL DRAWINGS.
8. FENCE ; SEE 11/A2.1
9. COLOR 1: PMS 540 BAY BLUE
10. COLOR 2: PMS METALLIC 871 GOLDEN SAND
11. COLOR 3: PMS 341 VALLEY GREEN
12. SINE CURVE ACCENTS: WHITE ON COLOR 1 BACKGROUND, COLOR 2 ON COLOR 3 BACKGROUND
13. LOUVER 48" W x 48" H
14. COLOR 4: SHERWIN WILLIAMS 6784 BRAVO BLUE

VERIFY COLORS WITH OWNER AND CSUMB REPRESENTATIVE PRIOR TO PAINTING



ELEVATION SCALE: 1/8" = 1'-0"
PATTERN SHOWN FLAT
0 2 4 8 16
SCALE: 1/8" = 1'-0"



UNWRAPPED ELEVATION SCALE: 1/16" = 1'-0"
0 4 8 16 32
SCALE: 1/16" = 1'-0"

TANKS
SCALE: VARIES

Source: The Paul Davis Partnership, LLP, December 2020

Title: A1/A2 Reservoirs and B/C BPS Elevations

Date 1/4/2021
Scale 1"=16'
Project 2019.20

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Figure 7

The existing B/C BPS station was constructed prior to 1960 and much of the equipment is nearing the end of its service life. The 1.0-million-gallon (MG) concrete forebay (i.e., the Sand Tank) has developed a crack and is no longer operating at full capacity. Once the proposed project is completed, the existing B/C BPS and Sand Tank can be demolished, and the easement quitclaimed back to the City of Marina (**Figure 8**).

The following discussion provides a more detailed description of key project elements, including grading requirements, construction, fencing and visual considerations, and landscaping and tree removal.

A1/A2 Reservoirs And B/C BPS Site

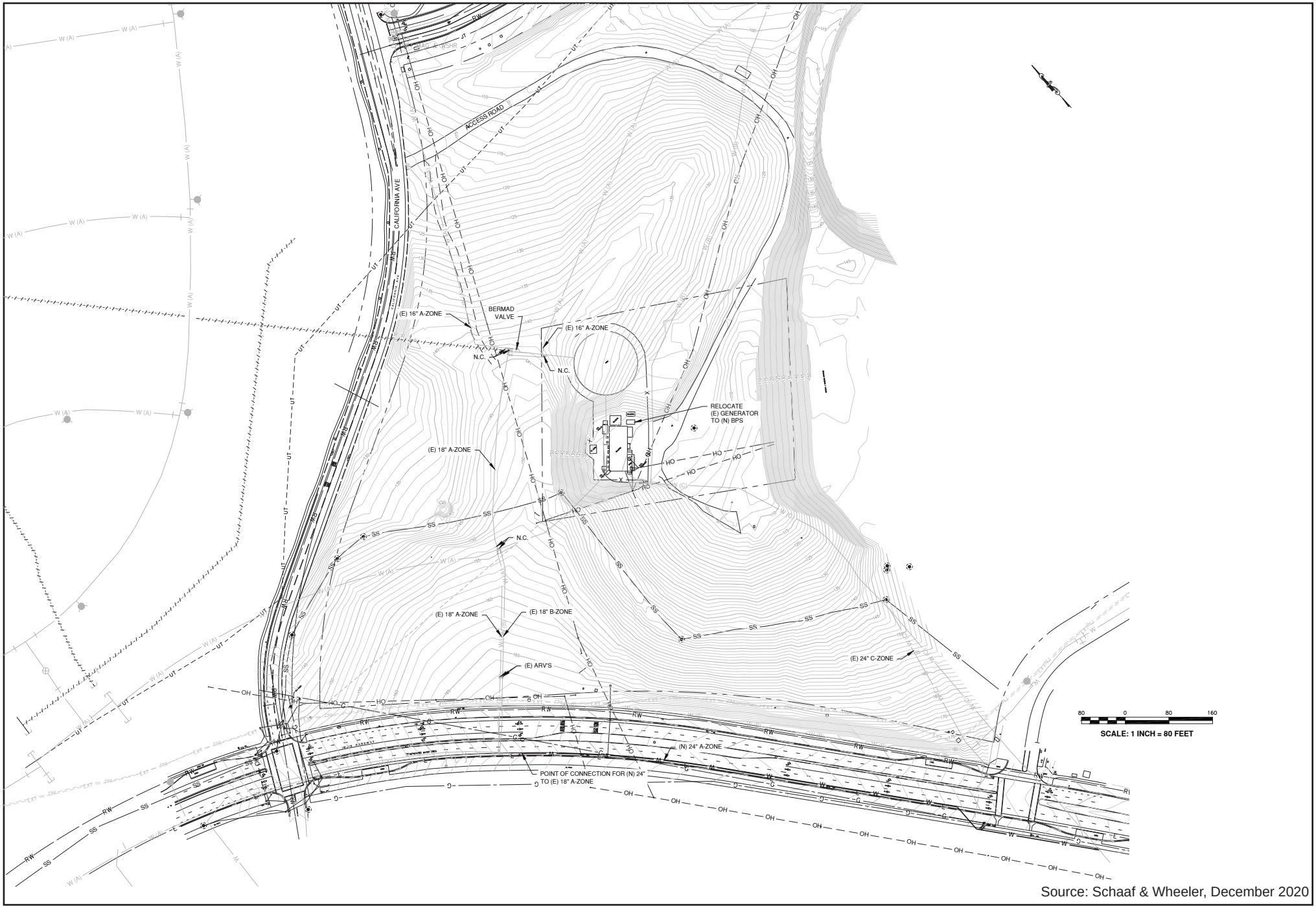
The 2020 Master Plan estimates the future maximum daily demand to be 16.5 million gallons per day (MGD), with 4.4 MGD in the A-Zone. The plan recommends developing 4.3 MG of total storage in the A-Zone. Reservoir 2 is maintained in the system but is considered to only have 1.1 MG of available storage as the forebay of the Central Marina BPS. The plan recommends the A1/A2 reservoirs to be 1.6 MG each.

The proposed tanks would be welded steel per American Water Works Association (AWWA) Standard D100, with concrete ring foundations. Each tank would be equipped with two ground-level manway hatches, a ladder with safety cage and fall protection system (harness rail), a locking roof hatch, a screened roof vent, an internal overflow drain pipe, and an ultrasonic level sensor.

The proposed tanks would be 36 feet tall at the roof peak and have a diameter of 114 feet. The A-Zone hydraulic gradient would be maintained at the current 221-feet NGVD (223.8-ft NAVD). The tank pad elevation of 199 feet NAVD is proposed based on site topography. The proposed site slopes from elevation 200 feet in the southwest to elevation 195 feet in the northwest. Grading the site for the northern tank would affect the existing surface drainage and require new storm drain inlets. In addition, several existing underground utilities cross the site and would require relocation.

Within the Ord Community, the A-Zone has a higher HGL of 236 feet, fed from PRV-24 and PRV-28. This setting would require adjusting once the new system comes online. The current wellfield controls are based on the water level in the Intermediate Reservoir, located on Old County Road. Part of the proposed project involves updating the MCWD's SCADA system to use the water level in the new A reservoirs for wellfield control (please refer to *INTERMEDIATE RESERVOIR, F BOOSTER PUMP STATION, AND ORD WELLFIELD CHLORINATION BUILDING* discussion below for more details*)*. The Intermediate Reservoir would then serve only as a forebay tank for the F BPS, which supplies the eastern portion of the C-Zone. The altitude valve at the Intermediate Reservoir would maintain the water level in that tank. The SCADA effort includes updating the radio paths to allow the wells to communicate directly with the new A1/A2 reservoirs and not rely on relaying through the Intermediate Reservoir.

The new B/C BPS would be constructed adjacent to the new A1/A2 reservoirs on the CSUMB campus on an existing parking lot off 6th Avenue south of 8th Street. A portion of the C-Zone transmission main from the existing BPS would be converted to an A-Zone transmission main to supply the new reservoirs. This would require adding a new 24-inch pipeline in Imjin Parkway and adjusting valves at the existing pump station to use an existing 18-inch pipeline to connect the wellfield transmission mains to the aforementioned C-Zone transmission main. The pipeline would connect the existing A-Zone main in Imjin Parkway



Source: Schaaf & Wheeler, December 2020

Title:

Existing B/C BPS and Sand Tank Site Transition Plan

Date	1/4/2021
Scale	1"=80'
Project	2019.20

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Figure 8

into the 24-inch main at the intersection of Imjin Parkway and Abrams Drive. The pipeline would be located in the outside travel lane. The 2020 Master Plan determined pumping capacities for the B/C BPS to be 3,200 gpm to Zone B and 5,000 gpm to Zone C. The MCWD has requested that the station have a firm capacity of 3,300 gpm to Zone B and 6,000 gpm to Zone C, with one redundant pump for each zone.

Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building

The proposed project would involve various improvements at the existing Intermediate Reservoir and Ord Wellfield Chlorination Building. The proposed project would include updates to the existing SCADA system, replace the altitude valve, replace the emergency generator and recoat the Intermediate Reservoir. Improvements on the Ord Community wellfield disinfection system at the Chlorination Building include adding a flow meter on the wellfield main, and variable speed drives on the dosing pumps.

The proposed project would include updating the Ord Community wellfield disinfection system. Sodium hypochlorite (NaOCl) is currently injected into the 24-inch wellfield pipeline just upstream of the Intermediate Reservoir. The current system has five dosing pumps, one matched to each well. When a well pump is running, the matching dose pump runs concurrently. This method results in varying dosages into the pipeline since the well production rates vary based on the groundwater level and the system HGL. The system would be updated to add a flow meter on the wellfield main and varying speed drives on the dosing pumps so that the dosage can be matched to the actual flow rate in the wellfield transmission main.

Existing B/C Zones BPS

The B-Zone BPS has a firm capacity of 3,200 gpm with one 1,600 gpm pump in reserve. The C-Zone BPS has a firm capacity of 2,400 gpm with one 1,000 gpm pump in reserve. The existing B/C BPS is centrally located within an older portion of the Fort Ord wellfield (1940-1970 era), with multiple pipelines radiating out from the station. Some of these pipelines have been removed and some have been abandoned in place. There are two 16-inch pipelines that connect the wellfield to the BPS converge at the Bermad valve, which is located in a pipeline easement outside the BPS easement. These wellfield pipelines are planned to be replaced in the future with a 24-inch pipeline located in California Avenue and Imjin Parkway.

After the proposed project is completed, the existing B/C BPS and Sand Tank may be demolished, and the easement quitclaimed back to the City. However, any future demolition and/or decommissioning activities are not included as part of the proposed project since the timing and project-specific activities are unknown at this time. Construction activities at the Existing BPS site would involve the relocation of a generator from the existing building and installation of a new pipeline within the Imjin Parkway and California Avenue right-of-way (ROW) (i.e., within existing pavement).

Construction

Ground disturbance for construction of the reservoirs and B/C BPS would be approximately 1.6 acres and 0.59 acres for pipeline trenching. Construction activities would include excavation to install foundations, precast concrete manholes, drainage inlets, meter vaults, and pipelines, pavement cutting for pipeline trenches, pipeline installation using lifting equipment and trench boxes, trench and excavation backfilling and compaction, cast-in-place concrete work for foundations, manhole bases and equipment pads, and street paving. The system transition would require installing tees and valves on existing water transmission mains, filling and testing the new water tanks, and then testing and commissioning the new booster pump station. Construction equipment would include, but would not be limited to, tracked excavator, roller

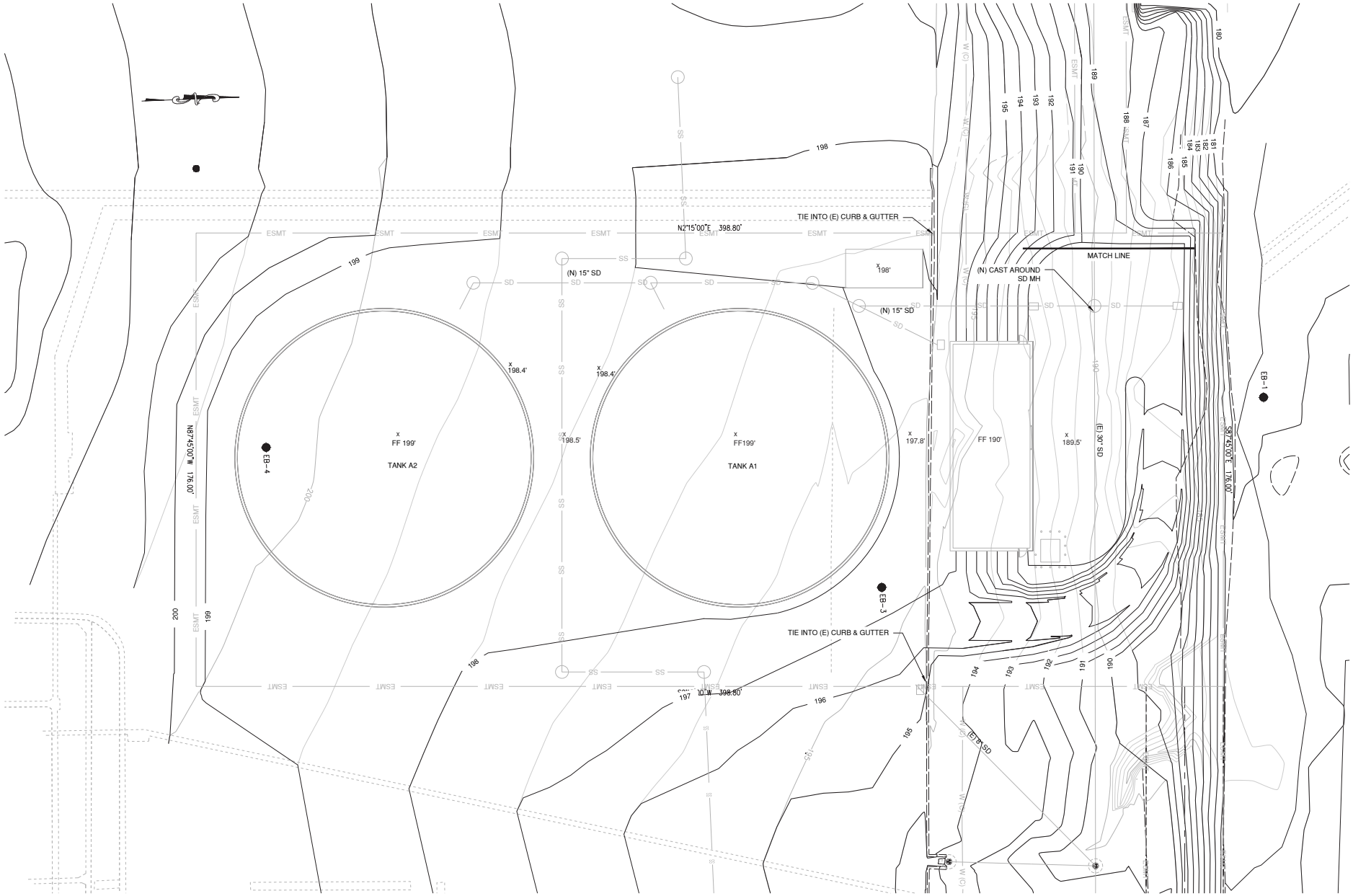
compactor, loader, crane, asphalt paving equipment, various smaller vehicles, and welders for tank construction. The pipeline easement and the sloped portion of the facility easement contain eucalyptus and pine trees which must be removed to allow construction. Work within roads would require traffic control and flagmen. The overall proposed project construction would take 24 months to complete. The reservoirs and B/C BPS may be constructed and tested without interrupting the existing water system, except for making the pipeline connections.

The tank pads at the reservoir and B/C BPS site would be over-excavated and re-compacted following the recommendations of the geotechnical report (please refer to Section 5.2.7, Geology and Soils) (**Figure 9**). The existing site is on compacted fill, and, therefore, the required over-excavation is less than 10 feet in depth. The project site would be filled to provide two tank pads at an elevation of 199 feet (NAVD). The existing site drainage is to the northeast, with an existing oil-water separator located just east of the facility easement. Grading for the tank pads would intercept surface flow coming from the City's Corporation Yard, and new gravity storm sewer and inlets would be installed on the west side of the facility easement. The majority of the easement area is paved, and the only added impervious area would be the pump station building and access road.

Site access to the reservoirs and B/C BPS site for construction would be through the existing parking lots north and east of the site. The City is agreeable to allow routine access across their adjacent Corporation Yard along the storm drain pipeline alignment for long-term access to the reservoirs and B/C BPS site. Due to the grade change and location of the City's security gate, construction access would start at the gate next to the existing Promontory lift station, proceed south along the paved roadway, and turn east onto a new driveway that follows the alignment of the existing 30-inch storm drain.

Ground disturbance for construction activities at the Intermediate Reservoir, F BPS, and Ord Wellfield Chlorination Building would be less than 1,000 sf to install valves and vaults, run new conduits, and add a service tap, primarily within the existing dirt and gravel roadways. The remaining improvements would occur within developed areas and would not require ground disturbance (i.e., replace generator and altitude valve, recoat water tank, and update SCADA system). Construction equipment would include, but would not be limited to, trenching equipment, loader, various smaller vehicles, and welders. Work within the road would not require traffic control or flagmen since no unauthorized vehicles are allowed. Portions of this site work would occur concurrently with the other proposed project components. The chlorination system modifications would occur after the new reservoirs are completed and operational.

No new separate construction access roads would be needed. During construction, two round trip truck trips per day are expected. The largest traffic day would be concrete delivery for tank and building foundations, which anticipates 20 ready-mix delivery trucks. Most days, eight to 20 employees are expected on the construction site per day depending on the activity. Concrete foundation placement would require up to 20 employees for approximately four to five days.



NOTE:
MAINTAIN A MINIMUM SLOPE OF 3:1 (H:V)

Source: Schaaf & Wheeler, December 2020

Title: Grading Plan

Date 1/4/2021
Scale 1"=20'
Project 2019.20

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Figure 9

Fencing and Visual Considerations

The easement agreement with CSUMB requires the design to include "reasonable architectural treatments" for the proposed reservoirs. The proposed height of the reservoirs is comparable to a three-story building, and, although other buildings of that height occur on the campus, none are in the immediate project area. Adjacent to the site but not on campus property, the City Corporation Yard Building is taller than the proposed height of the reservoirs.

Campus staff has suggested several treatment options, as listed below (**Figure 10**). The visual treatment for the tanks would be determined during final project design, but would involve one or more of the options below.

- Screening the proposed tanks and site with trees, and
- Painting the proposed tanks to provide a "land and sky" appearance.

Campus staff has also requested removing the proposed chain link fence around the reservoir and B/C BPS site. Instead of chain link, CSUMB staff is recommending a rigid steel security fence with tightly spaced bars and outward-curving pickets, similar to the security fence at the Department of Defense (DOD) Center on Gigling Road (**Figure 10**). Fences of this type are powder coated steel with line posts every 10 feet and panels affixed with security-head bolts, which require a special tool for removal. Gates may be swinging or sliding.

The proposed pump building would be partially hidden, but the exposed portions would be subject to review by Campus Planning Staff. A concrete masonry unit building with muted colors is proposed in order to make the building blend with its surroundings. The proposed generator would be in a visible location, partially screened from view by the proposed water tanks. A screening wall may be installed on the north side of the generator, which faces the existing and proposed future housing units. A screening wall would serve as an additional sound buffer in that direction. The enclosure may also be painted to match the other site elements (i.e., tanks and pump building).

Landscaping & Tree Removal

The pipeline easement and the sloped portion of the facility easement at the A1/A2 reservoirs and B/C BPS site contain eucalyptus, oak, and pine trees, as well as one cypress tree, which must be removed to allow construction (**Figure 11**). Due to the number of pipelines within the site, replanting trees inside the facility easement would not be practical as the roots could damage the pipelines.

While the majority of the reservoir and B/S BPS site would be paved, the areas outside the fence line are being dedicated for replanting trees. Establishment watering of the replanting areas may occur by hand using a hose and/or by a surface-laid irrigation system. A permanent irrigation system would not be required.

Photo 1: Example of textured surface.

Photo 2: Example of tree screening and “tree line and sky” painted mural.

Photo 3: Example fence and gate at Department of Defense Center.

Source: Schaaf & Wheeler, September 2019

Title: Visual Considerations

Date 11/22/19
Scale N/A
Project 2019.20

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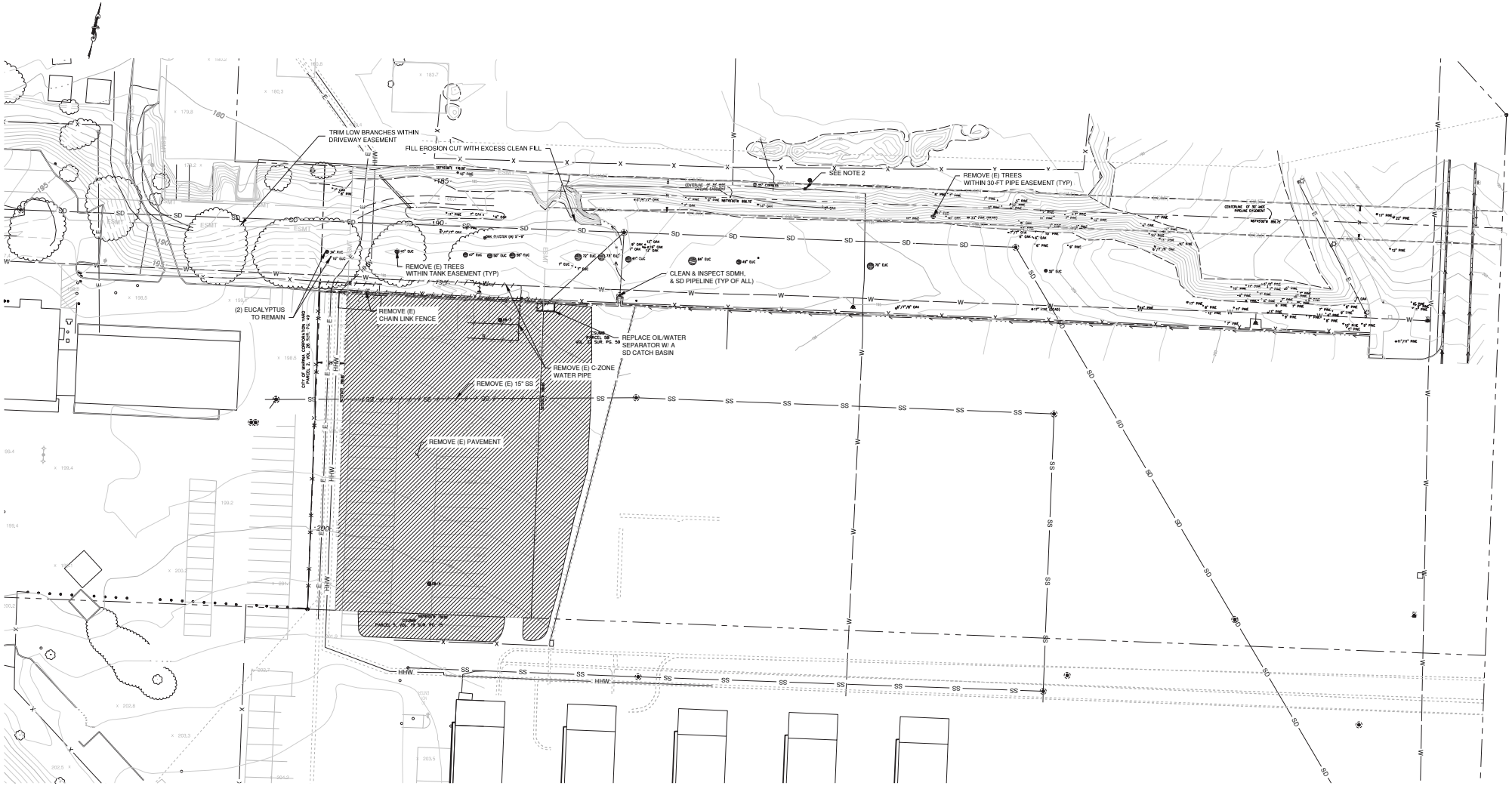
Figure 10



Source: Schaaf & Wheeler, December 2020

Title:

Demolition Plan

Date	1/4/2021
Scale	1”=40”
Project	2019.20

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Figure
11

Operation & Maintenance

Operational activities would consist of the maintenance of the project sites, and would include one pick-up truck daily, and up to five additional single-vehicle visits per month. Additionally, six larger truck trips per year would be required for pump motor maintenance and generator fueler.

2.5 PROJECT APPROVALS

This Initial Study is an informational document for both agency decision-makers and the public. The MCWD is the Lead Agency responsible for adoption of this IS/MND. Below is a general list of agencies that may have jurisdiction over the proposed project. This list is not considered exhaustive and additional agencies and/or jurisdictions may have permitting authority.

REGIONAL AND STATE AGENCIES

- Regional Water Quality Control Board: National Pollution Discharge Elimination System (NPDES) and General Construction Permit
- California State University Monterey Bay (CSUMB): Encroachment Agreement

LOCAL AGENCIES

- Monterey Bay Air Resource District: Permit for Emergency Generator
- City of Marina: Facility Easement, Road Right-of Way/Encroachment, Ordnance Ordinance

3. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- ☐ Aesthetics
- ☐ Agriculture and Forestry Resources
- ☐ Air Quality
- ☑ Biological Resources
- ☑ Cultural Resources
- ☐ Geology and Soils
- ☐ Greenhouse Gas Emissions
- ☑ Hazards and Hazardous Materials
- ☐ Hydrology and Water Quality
- ☐ Land Use
- ☐ Mineral Resources
- ☐ Noise
- ☐ Population and Housing
- ☐ Public Services
- ☐ Recreation
- ☐ Transportation
- ☑ Tribal Cultural Resources
- ☑ Utilities and Service Systems
- ☑ Mandatory Findings of Significance

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4. DETERMINATION

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☑ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature

1/5/2021
Date

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5. ENVIRONMENTAL EVALUATION

This Initial Study evaluates the following resource sections within **Section 5.2. Environmental Setting and Impacts:** aesthetics, agricultural and forestry resources, air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use, mineral resources, noise, population/housing, public services, recreation, transportation, tribal resources, utilities and service systems, and wildfire.

5.1 EVALUATION OF ENVIRONMENTAL IMPACTS

The following describes how the proposed project's impacts to resource areas will be analyzed in this Initial Study in accordance with CEQA. Each resource section includes: 1) existing setting and applicable regulatory background, 2) CEQA impact checklist for the resource area, and 3) impact discussion in response to the questions in the checklist and mitigation where warranted. The impact discussion will identify the level of environmental effect from the proposed project. An explanation or discussion is required for all answers to the resource impact checklist as follows.

1. A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project would not expose sensitive receptors to pollutants, based on project-specific screening analysis).

2. All answers must take into account the whole action involved, including offsite as well as onsite, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3. Once the lead agency has determined that a particular environmental impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant based on the thresholds. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4. "Less Than Significant with Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less-Than-Significant Impact." The lead agency must describe the mitigation measures and briefly explain how they reduce the effect to a less-than-significant level mitigation measures.

5. Supporting Information Sources: A source list will be attached, and other sources used, or individuals contacted will be cited in the discussion.

6. The explanation of each issue will identify:

    a. The significance criteria or threshold, if any, used to evaluate each question; and

    b. The mitigation measure identified, if any, to reduce the impact to less than significant.

5.2 ENVIRONMENTAL SETTING AND IMPACTS

The following section describes the environmental setting and identifies the environmental impacts anticipated from implementation of the proposed project. The criteria provided in the CEQA environmental checklist was used to identify potentially significant environmental impacts associated with the project.

5.2.1 AESTHETICS

Setting

The proposed project sites are located in primarily developed areas. None of the project sites are located in visually sensitive areas designated by the City's General Plan or CSUMB 2007 Master Plan. The new pipeline at the Existing B/C BPS site would occur within the existing roadways and would not be visible to the public. Similarly, at the Intermediate Reservoir site, the proposed improvements are associated with existing infrastructure and structures and would not be visible to the public.

The proposed reservoirs and new B/C BPS would involve new facilities on the CSUMB campus. The proposed tanks would be limited to a maximum height of 36 feet and diameter of 114 feet. The easement agreement with CSUMB requires the design to include "reasonable architectural treatments" for the proposed reservoirs. The proposed height of the reservoirs is comparable to a three-story building, and, although other buildings of that height occur on the campus, none are in the immediate project area. The operation of the new B/C BPS would require new exterior lighting.

The State Scenic Highways Program is designed to protect and enhance the natural scenic beauty of California highways and adjacent corridors through special conservation treatment. SR 1 is located approximately one mile west from the nearest project site, and this section of SR 1 is not designated as scenic; however, it is listed as eligible for scenic highway designation by the California Scenic Highway Mapping System (Caltrans, 2018). The proposed project locations are inland from SR 1 and are not visible from due to distance and topography.

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
AESTHETICS. Would the project:					
a) Have a substantial adverse effect on a scenic vista? (Source: 1, 2, 3, 4)				X	1, 2, 3, 4, 5
b) Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway? (Source: 1, 2, 3, 4, 5)				X	1, 2, 3, 6
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality? (Source: 1, 2)			X		1, 2, 3

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area? (Source: 1, 2)			X		1, 2, 3

Explanation

a) **No Impact**. A scenic vista is generally characterized as a viewpoint that provides expansive views of a highly valued landscape for the benefit of the general public. As discussed above, the proposed project sites are not located within any designated scenic vistas. As a result, the proposed project would not impact scenic vistas.

b) **No Impact**. As discussed above, the proposed project sites are not visible from any designated state scenic highways. Therefore, no impact to scenic resources within a state scenic highway would occur.

c) **Less-Than-Significant Impact**. With the exception of the Intermediate Reservoir site, the proposed facilities would be located in urbanized areas. The Intermediate Reservoir site is located adjacent to residential uses and open space, and generally non-urbanized. The proposed improvements at this site would involve primarily existing facilities within an existing easement and would not result in the construction new facilities and structures that would substantially degrade the existing visual character or quality of public views in the area.

The proposed activities at the Existing BPS site would involve the relocation of a generator inside the existing building and installation of a new pipeline within the Imjin Parkway and California Avenue right-of-way (ROW) (i.e., within existing pavement). The proposed improvements at this site would involve primarily existing facilities within an existing easement and would not result in the construction new facilities and structures that would substantially degrade the existing visual character or quality of public views in the area.

The proposed reservoirs and new B/C BPS would involve new facilities on the CSUMB campus. The proposed tanks would be limited to a maximum height of 36 feet and diameter of 114 feet. The easement agreement with CSUMB requires the design to include "reasonable architectural treatments" for the proposed reservoirs. The proposed height of the reservoirs is comparable to a three-story building, and, although other buildings of that height occur on the campus, none are in the immediate project area. Adjacent to the site but not on campus property, the City Corporation Yard Building is taller than the proposed height of the reservoirs.

Campus staff has suggested several treatment options, as listed below (**Figure 10**). The visual treatment for the tanks would be determined during final project design, but would involve one or more of the options below.

- Screening the proposed tanks and site with trees, and
- Painting the proposed tanks to provide a "land and sky" appearance.

Campus staff has also requested removing the proposed chain link fence around the reservoir and B/C BPS site. Instead of chain link, CSUMB staff is recommending a rigid steel security fence with tightly spaced bars and outward-curving pickets, similar to the security fence at the Department of Defense (DOD) Center on Gigling Road (**Figure 10**). Fences of this type are powder coated steel with line posts every 10 feet and panels affixed with security-head bolts, which require a special tool for removal. Gates may be swinging or sliding.

The proposed pump building would be partially hidden, but the exposed portions would be subject to review by Campus Planning Staff. A concrete masonry unit building with muted colors is proposed in order to make the building blend with its surroundings. The proposed generator would be in a visible location, partially screened from view by the proposed water tanks. A screening wall may be installed on the north side of the generator, which faces the existing and proposed future housing units. A screening wall would serve as an additional sound buffer in that direction. The enclosure may also be painted to match the other site elements (i.e., tanks and pump building).

Implementation of the proposed project would result in impacts to trees within CSUMB campus boundaries at the A1/A2 reservoirs and B/C BPS site; tree removal is not proposed at the other two project sites. The pipeline easement and the sloped portion of the facility easement at the A1/A2 reservoirs and B/C BPS site contain eucalyptus, oak, and pine trees, as well as one cypress tree, which must be removed to allow construction (**Figure 12**). Due to the number of pipelines within the site, replanting trees inside the facility easement would not be practical as the roots could damage the pipelines (**Figure 13**).

CSUMB has established a tree restoration program for impacts to coast live oak and other trees resulting from projects that take place on campus. This program requires that for trees with a four-inch diameter at breast height (dbh) or greater removed, a minimum of two coast live oak trees would be replanted in the identified restoration area on campus. The implementation of this program is required for all projects that would result in impacts to trees. Therefore, as a feature of the project design, two coast live oak trees would be replanted for every tree with a greater than four-inch dbh removed. In addition, while the majority of the reservoir and B/S BPS site would be paved, the areas outside the fence line are being dedicated for replanting trees. Establishment watering of the replanting areas may occur by hand using a hose and/or by a surface-laid irrigation system. A permanent irrigation system would not be required. The replanting specifications would be required in final project plans.

With the incorporation of the visual treatments into final design, replacement and replanting of impacted trees, and required review and approval by CSUMB Planning Staff, potential impacts to the visual character of this site are less-than-significant.

Construction activities would include the presence of construction vehicles, equipment and materials, stockpiles, and exposed soils. Construction activities at each of the project sites would result in a short-term, temporary impact to the visual character of the sites. Therefore, construction impacts to the visual character of the sites are less than significant.

For these reasons, construction and operation of the proposed project would result in a less-than-significant impact to the visual quality of the site.

Existing BPS Site Vegetation Communities

Date: 12/15/2020

Scale: 1 inch = 300 feet

Project: 2019-20

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Figure 12

Proposed B/C BPS and A1/A2 Reservoirs Site Vegetation Communities

Date: 12/15/2020

Scale: 1 inch = 300 feet

Project: 2019-20

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Figure 13

d) **Less-than-Significant Impact**. The proposed reservoirs and B/C BPS would include new exterior lighting. However, all proposed exterior lighting would be downward-facing, shielded to direct light downwards to ensure that lighting does not spill over onto nearby properties, and consistent with local lighting ordinances. In addition, the proposed project does not propose to introduce materials into the design that would create substantial glare. Therefore, the proposed project would have a less-than-significant impact on light and glare.

Conclusion: The project would have a less-than-significant impact on aesthetics.

5.2.2 AGRICULTURAL AND FORESTRY RESOURCES

Setting

In California, agricultural land is given consideration under CEQA. According to Public Resources Code §21060.1, "agricultural land" is identified as prime farmland, farmland of statewide importance, or unique farmland, as defined by the U.S. Department of Agriculture land inventory and monitoring criteria, as modified for California:

- Prime Farmland (P) comprises the best combination of physical and chemical features able to sustain long-term agricultural production. Irrigated agricultural production is a necessary land use four years prior to the mapping date to qualify as Prime Farmland. The land must be able to store moisture and produce high yields.
- Farmland of Statewide Importance (S) possesses similar characteristics to Prime Farmland with minor shortcomings, such as less ability to hold and store moisture and more pronounced slopes.
- Unique Farmland (U) has a production history of propagating crops with high-economic value.
- Farmland of Local Importance (L) is important to the local agricultural economy. Local advisory committees and a county specific Board of Supervisors determine this status.
- Grazing Land (G) is suitable for browsing or grazing of livestock.

The Monterey County Important Farmlands Map classifies the land containing the proposed reservoir and BPS site as "Urban and Built Up Land" and the proposed Intermediate Reservoir and Ord Community Wellfield as "Other Land." CEQA also requires consideration of impacts on lands that are under Williamson Act contract. The project sites do not contain lands under Williamson Act contract (DOC, 2016).

CEQA requires the evaluation of forest and timber resources where they are present. The project sites do not contain any forest land as defined in Public Resources Code section 12220(g), timberland as defined by Public Resources Code section 4526, or property zoned for Timberland Production as defined by Government Code section 51104(g).

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
AGRICULTURAL AND FOREST RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:					
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? (Source: 2, 6)				X	1, 2, 3, 7
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract? (Source: 2, 6)				X	1, 2, 3, 4, 5
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? (Source: 2, 6)				X	1, 2, 3, 7
d) Result in the loss of forest land or conversion of forest land to non-forest uses? (Source: 2, 6)				X	1, 2, 3, 4, 7
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use? (Source: 2, 6)				X	1, 2, 3, 4, 7

Explanation

a, b) **No Impact**. The project sites are designated as "Other Land" or "Urban of Built Up Land" on the Important Farmlands Map for Monterey County and does not contain any prime farmland, unique farmland, farmland of statewide importance (farmland), or lands under Williamson Act contract. As a result, the proposed project would not convert farmland to a non-agricultural use, nor conflict with existing zoning for agricultural use or a Williamson Act contract.

c, d) **No Impact**. The proposed project would not impact forest resources or result in the loss or conversion of forest land since the project site does not contain any forest land as defined in Public Resources Code section 12220(g), timberland as defined by Public Resources Code section 4526, or property zoned for Timberland Production as defined by Government Code section 51104(g).

e) **No Impact**. As per the discussion above, the proposed project would not involve changes in the existing environment which, due to their location or nature, could result in conversion of farmland or agricultural land, since none are present on this property. The proposed project would involve the new water facilities and improvements to existing water facilities, and would not convert any land for other use.

Conclusion: The proposed project would have no impact on agricultural and forest resources.

5.2.3 AIR QUALITY

Setting

The Federal Clean Air Act and the California Clean Air Act mandate the control and reduction of specific air pollutants. Under these Acts, the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board have established ambient air quality standards for specific "criteria" pollutants, designed to protect public health and welfare. Primary criteria pollutants include carbon monoxide (CO), reactive organic gases (ROG), nitrogen oxides (NO_X), particulate matter (PM_{10}), sulfur dioxide (SO_2), and lead (Pb). Secondary criteria pollutants include ozone (O_3), and fine particulate matter ($PM_{2.5}$).

The project site is located within the North Central Coast Air Basin (NCCAB), which is comprised of Santa Cruz, San Benito, and Monterey Counties, and is regulated by the Monterey Bay Air Resources District (MBARD, formally known as Monterey Bay Unified Air Pollution Control District).

The U.S. EPA administers the National Ambient Air Quality Standards (NAAQS) under the Federal Clean Air Act. The U.S. EPA sets the NAAQS and determines if areas meet those standards. Violations of ambient air quality standards are based on air pollutant monitoring data and evaluated for each air pollutant. Areas that do not violate ambient air quality standards are considered to have attained the standard. The NCCAB is in attainment for all NAAQS and for all California Ambient Air Quality Standards (CAAQS) except O_3 and PM_{10}. The primary sources of O_3 and PM_{10} in the NCAAB are from automobile engine combustion. To address exceedance of these CAAQS, the MBARD has developed and implemented several plans including the 2005 Particulate Matter Plan, the 2007 Federal Maintenance Plan, and the 2012-2015 Air Quality Management Plan (AQMP), a revision to the 2012 Triennial Plan. NCCAB Attainment Status to National and California Ambient Air Quality can be found in **Table 1** below.

Table 1.
North Central Coast Air Basin Attainment Status Summary as of January 2015

Pollutant	State Standards[1]	National Standards
Ozone (O_3)	**Nonattainment[2]**	Attainment / Unclassified[3]
Inhalable Particulates (PM_{10})	**Nonattainment**	Attainment
Fine Particulates ($PM_{2.5}$)	Attainment	Attainment / Unclassified[4]
Carbon Monoxide (CO)	Attainment	Attainment / Unclassified
Nitrogen Dioxide (NO_2)	Attainment	Attainment / Unclassified[5]
Sulfur Dioxide (SO_2)	Attainment	Attainment[6]
Lead	Attainment	Attainment / Unclassified[7]

Notes:
1) State designations based on 2010 to 2012 air monitoring data.
2) Effective July 26, 2007, the ARB designated the NCCAB a nonattainment area for the state ozone standard, which was revised in 2006 to include an 8-hour standard of 0.070 ppm.
3) On March 12, 2008, EPA adopted a new 8-hour ozone standard of 0.075 ppm. In April 2012, EPA designated the NCCAB attainment/unclassified based on 2009-2011 data.
4) This includes the 2006 24-hour standard of 35 µg/m3 and the 2012 annual standard of 12 µg/m^3.
5) In 2012, EPA designated the entire state as attainment/unclassified for the 2010 NO2 standard.
6) In June 2011, the ARB recommended to EPA that the entire state be designated as attainment for the 2010 primary SO2 standard. Final designations to be addressed in future EPA actions.
7) On October 15, 2008 EPA substantially strengthened the national ambient air quality standard for lead by lowering the level of the primary standard from 1.5 µg/m3 to 0.15 µg/m^3. Final designations were made by EPA in November 2011.
8) Nonattainment designations are highlighted in Bold.

Plans to attain these standards already accommodate the future growth projections available at the time these plans were prepared. Any development project capable of generating air pollutant emissions

exceeding regionally-established criteria is considered significant for purposes of CEQA analysis, whether or not such emissions have been accounted for in regional air planning. Furthermore, any project that would directly cause or substantially contribute to a localized violation of an air quality standard would generate substantial air pollution impacts. The same is true for a project that generates a substantial increase in health risks from toxic air contaminants or introduces future occupants to a site exposed to substantial health risks associated with such contaminants.

Sensitive receptors are more susceptible to the effects of air pollution than the general population. Land uses that are considered sensitive receptors include residences, schools, and health care facilities. Sensitive receptors in the vicinity consist of residential uses ranging from 350 to 500 feet from the project sites.

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan? (Source: 1, 2, 7, 8)			X		1, 2, 3, 9
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard? (Source: 1, 2, 7, 8)			X		1, 2, 3, 8
c) Expose sensitive receptors to substantial pollutant concentrations? (Source: 1, 2, 7, 8)			X		1, 2, 3
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? (Source: 1, 2, 7, 8)			X		1, 2, 3, 8

Explanation

a) **Less-Than-Significant Impact**. CEQA Guidelines §15125(b) requires that a project is evaluated for consistency with applicable regional plans, including the AQMP. As stated above, the MBARD has developed and implemented several plans to address exceedance of state air quality standards, including the MBARD 2012-2015 AQMP. The MBARD is required to update their AQMP once every three years; the most recent update was approved in March 2017. This plan addresses attainment of the state ozone standard and federal air quality standard. The AQMP accommodates growth by projecting growth in emissions based on population forecasts prepared by the Association of Monterey Bay Area Governments (AMBAG) and other indicators.

The proposed project would not result in a substantial increase in employment, nor would the proposed project result in increased population growth. The proposed project would be consistent with the MBARD 2012-2015 AQMP. In addition, as noted in Response b, below, the proposed project would not result in a significant increase in emissions. For these reasons, implementation of the proposed project is not anticipated to result in a substantial increase in either direct or indirect emissions that would conflict with or obstruct implementation of the AQMP; this impact is considered less than significant.

b) **Less-Than-Significant Impact.** Grading and filling during construction could result in impacts to air quality. Site disturbance activities could result in short-term, localized decrease in air quality due to the generation of particulate emissions (PM_{10}). The MBARD 2008 CEQA Air Quality Guidelines contains standards of significance for evaluating potential air quality effects of projects subject to the requirements of CEQA (see Table 5-1, pg. 5-14, of the MBARD 2008 CEQA Guidelines). According to MBARD, a project would violate an air quality standard and/or contribute to an existing or projected violation if it would:

- Emit (from all sources, including exhaust and fugitive dust) less than;
  - 137 pounds per day of oxides of nitrogen (NOx)
  - 137 pounds per day of reactive organic gases (ROG)
  - 82 pounds per day of respirable particulate matter (PM_{10})
  - 55 pounds per day of fine particulate matter ($PM_{2.5}$)
  - 550 pounds per day carbon monoxide (CO)

Construction. According to the MBARD's criteria for determining construction impacts, a project would result in a potentially significant impact if it would result in 8.1 acres of minimal earthmoving per day or 2.2 acres per day with major grading and excavation. Construction of the proposed reservoir and B/C BPS facilities would involve a maximum of 800 CY of cut and 3,000 CY of fill, with 2,000 net import of fill, to be graded total, and, therefore, the proposed project is below the threshold. Construction activities at the other two sites would involve minimal grading and earthwork, far below the threshold. In addition, construction at each of the project sites would implement standard construction Best Management Practices (BMPs) related to dust suppression, which would include: 1) watering active construction areas; 2) prohibiting grading activities during periods of high wind (over 15 mph); 3) covering trucks hauling soil; and 4) covering exposed stockpiles. The implementation of BMPs would further ensure that potential construction-related emissions would be minimized. Since the proposed project is under the threshold for construction air quality impacts, this impact is considered to be less than significant.

Operation. Based on preliminary modeling, the MBARD establishes screening criteria for development projects which provide conservative indication of whether a development could result in a potentially significant impact on ozone. These are levels at which indirect sources and area sources could potentially emit 137 lb/day or more of VOC or NO_X. Per Table 5-4 of the MBARD 2012 CEQA Guidelines, industrial developments of 1,040,000 sq. ft. or more in size would create indirect emission sources with potentially significant impacts related to ozone and ozone precursors. The proposed project would result in the construction of approximately 60,000 sq ft of new facilities. Therefore, the proposed project is substantially below the screening criteria.

Operation of the proposed project would not result in a new or substantially more severe significant impact due to air quality emissions during operations. The proposed project is a replacement BPS and reservoir. The pumps are being relocated from the existing BPS in the Ord Community to the replacement BPS. Thus, the replacement BPS and pipeline would be consistent with the existing use and would not increase in operational emissions. The proposed project would also involve limited maintenance visits, resulting in vehicle trips; however, these trips would be consistent with the existing use. Based upon the low level of operational emissions and consistency of use,

operation of the proposed replacement BPS and pipeline would not result in emissions that would cause a new or substantially more severe impact based on an exceedance or violation of the applicable air quality standards or result in a cumulatively considerable net increase of any criteria pollutants.

Project construction and operation would not result in a significant air quality impact. As stated above, all impacts would be below applicable MBARD thresholds of significance, including thresholds for ozone precursors. As there are no significant impacts, project construction and operation would not result in a cumulatively considerable net increase in any criteria pollutant. Air quality impacts associated with the project would result in a less-than-significant impact.

c) **Less-Than-Significant Impact**. A "sensitive receptor" is generally defined as: any residence including private homes, condominiums, apartments, or living quarters; education resources such as preschools and kindergarten through grade twelve (k-12) schools; daycare centers; and health care facilities such as hospitals or retirement and nursing homes. Sensitive receptors in the vicinity consist of residential uses ranging from 350 to 500 feet from the project sites. The MBARD's 2008 CEQA Air Quality Guidelines state that a project would have a significant impact to sensitive receptors if it would cause a violation of any CO, PM_{10} or toxic air contaminant standards at an existing or reasonably foreseeable sensitive receptor.

As stated above in Response b, the proposed project would implement standard air quality BMPs and emissions of CO resulting from construction of the proposed project are below applicable MBARD thresholds of significance. The proposed project would not exceed any MBARD thresholds, including CO and PM_{10}. Compliance with applicable MBARD regulations also include, but are not limited to, Rule 402,[2] which would minimize potential nuisance impacts to occupants of nearby land uses. For these reasons, construction activities would be considered to have a less-than-significant impact to sensitive receptors. Additionally, implementation of the proposed project would not result in the installation of any major stationary or mobile sources of emissions. Operational activities of the project would have a less-than-significant impact to nearby receptors as emission are minimal and consistent with the zoning of the property.

d) **Less-Than-Significant Impact**. There may be intermittent odors from construction associated with diesel exhaust and exposed sewer manholes that could be noticeable at times. However, given the limited construction duration and distance from sensitive receptors, potential intermittent odors are not anticipated to result in odor complaints and would not affect a substantial number of people.

Conclusion: The proposed project would have a less-than-significant impact on air quality.

[2] MBARD Rule 402 "Nuisance" states, "A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. The provisions of this rule shall not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals."

5.2.4 BIOLOGICAL RESOURCES

Setting

The analysis presented in this section is from information contained in the Biological Resources Report prepared for the proposed project by Denise Duffy & Associates dated December 2020 (**Appendix A**). The Biological Resources Report describes existing biological resources within and surrounding the project sites, identifies any special-status species and sensitive habitats within and adjacent to the project sites, assess potential impacts that may occur to biological resources, and recommends appropriate avoidance, minimization, and mitigation measures necessary to reduce those impacts to a less-than-significant level.

DD&A conducted surveys of within study areas at each of the project sites in April and May 2019. Details, methods and data sources used for the botanical survey and reconnaissance-level wildlife habitat surveys can be found in **Appendix A**.

Vegetation communities mapped within the study areas include ruderal/disturbed, maritime chaparral, coast live oak woodland, and coastal scrub (**Figures 14-17**). In addition, the majority of the study areas are developed. Maritime chaparral habitat is identified as a sensitive habitat on the California Department of Fish and Wildlife's (CDFW's) *California Natural Communities List* (Sandmat manzanita chaparral *Arctostaphylos pumila* provisional shrubland alliance).

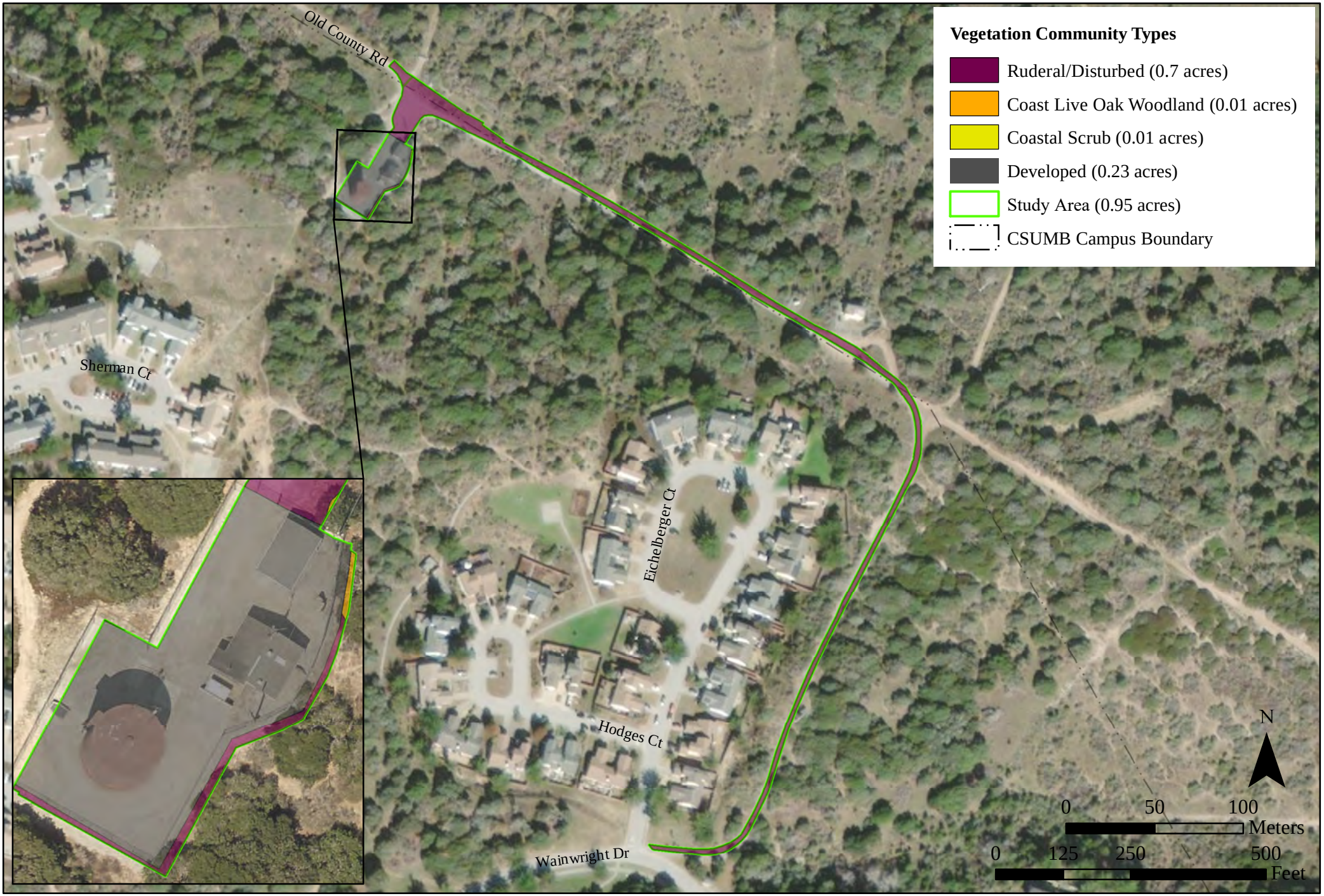
Several special-status species are known or have the potential to occur within the study areas based on observations, presence of appropriate habitat, and known occurrences within the vicinity (**Figures 14-17**). All other species evaluated have a low potential to occur, are assumed unlikely to occur, or were determined not present within the study areas for the species-specific reasons presented in **Appendix A**.

Table 2 identifies the potential for special-status wildlife species to occur within each of the study areas. **Table 3** lists the special-status plant species that were observed during these surveys. For the portion of the Intermediate Reservoir and Ord Wellfield study area that was not surveyed, **Table 4** identifies species with a moderate to high potential to occur within the unsurveyed area.

Table 2. Potential for Special-Status Wildlife Species Occurrence within the Study Areas			
Species	**Proposed B/C BPS Study Area**	**Existing BPS Study Area**	**Intermediate Reservoir and Ord Wellfield Study Area**
Monterey dusky-footed woodrat	Low	High	High
Monterey ornate shrew	Low	Moderate	High
California tiger salamander	Unlikely	Unlikely	Moderate
Northern California legless lizard	High	High	High
Coast horned lizard	Moderate	Moderate	Moderate
Coast Range newt	Moderate	Moderate	Moderate
Nesting raptors and other protected avian species	High	High	High
Bold indicates a Fort Ord HMP Species (please refer to Approach to Analysis for information on the HMP).			

Table 3. Special-Status Plant Species Observed within the Study Areas						
Species	**Area of Occurrence**					
	Proposed B/C BPS Study Area		**Existing BPS Study Area**		**Intermediate Reservoir and Ord Wellfield Study Area**	
	Area	***Individuals***	***Area***	***Individuals***	***Area***	***Individuals***
Monterey ceanothus	1,045 ft²	1	16,947 ft²	-	-	-
Monterey spineflower	-	-	-	-	282 ft²	9
Sand gilia	-	-	14 ft²	-	-	-
Sandmat manzanita	-	-	16,947 ft²	-	-	-
Bold indicates a Fort Ord HMP Species (please refer to Approach to Analysis for information on the HMP).						

Table 4. Potential Presence of Special-Status Plant Species within the Unsurveyed Portion of the Intermediate Reservoir and Ord Wellfield Study Area	
Species	**Potential Occurrence**
Sandmat manzanita	Moderate
Fort Ord spineflower	Moderate
Sand Gilia	Moderate
Monterey spineflower	High
Bold indicates a Fort Ord HMP Species (please refer to Approach to Analysis for information on the HMP)	



Intermediate Reservoir and Ord Wellfield Site Vegetation Communities

Date: 12/15/2020
Scale: 1 inch = 200 feet
Project: 2019-20

Monterey | San Jose
Denise Duffy and Associates, Inc.
Environmental Consultants Resource Planners
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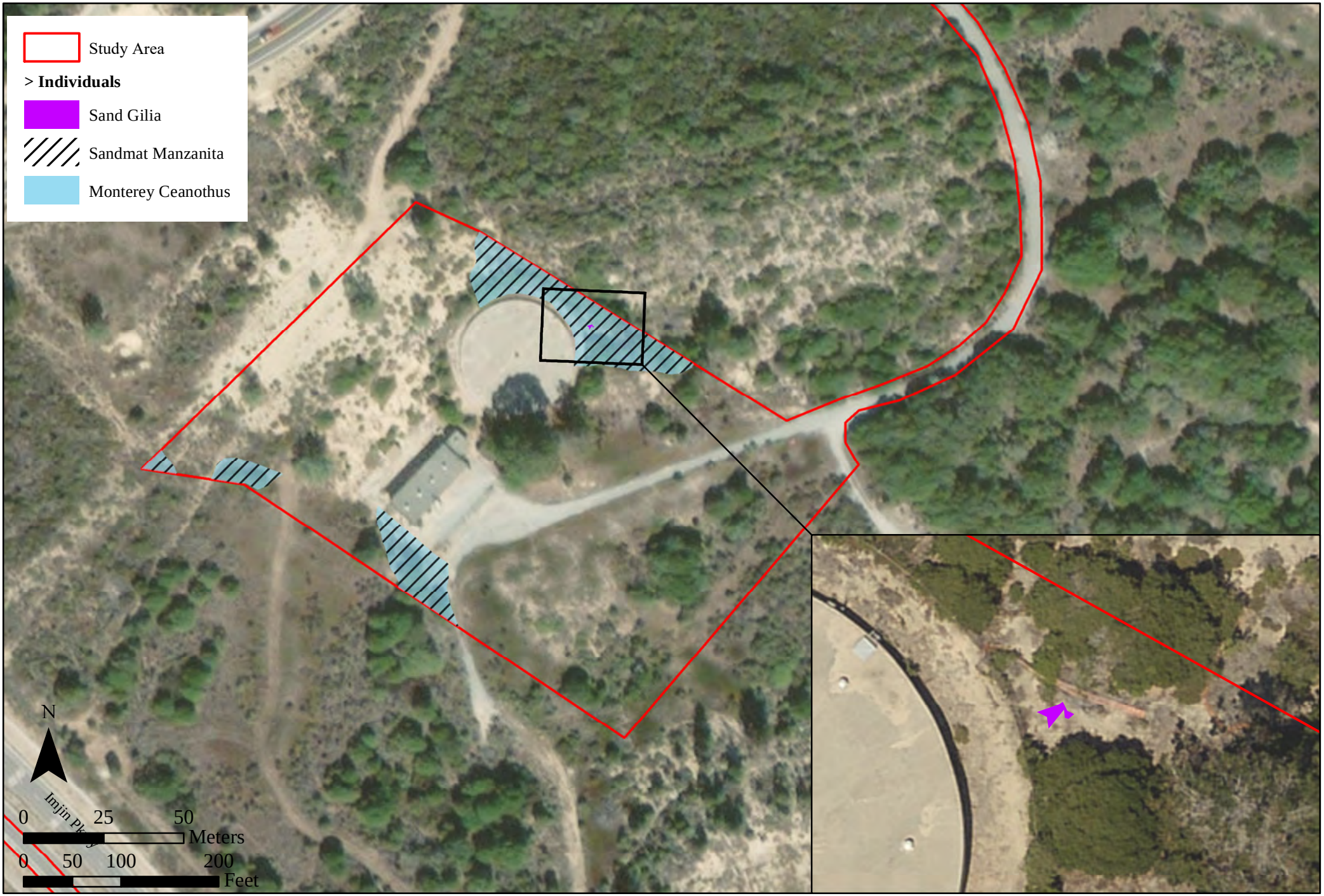
Figure 14



Existing BPS Site
Special-Status Plant Species Map

Date: 12/15/2020

Scale: 1 inch = 100 feet

Project: 2019-20

Monterey | San Jose
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Figure 15

Proposed B/C BPS and A1/A2 Reservoirs Site Special-Status Plant Species Map

Date: 12/15/2020
Scale: 1 inch = 80 feet
Project: 2019-20

Monterey | San Jose
Denise Duffy and Associates, Inc.
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Figure 16

Intermediate Reservoir and Ord Wellfield Site Special-Status Plant Species Map

Date: 12/15/2020
Scale: 1 inch = 100 feet
Project: 2019-20

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Figure 17

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
BIOLOGICAL RESOURCES. Would the project:					
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? (Source: 1, 2, 9)		X			1, 2, 3, 10
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service? (Source: 1, 2, 9)				X	1, 2, 3, 10
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? (Source: 1, 2, 9)				X	1, 2, 3, 10
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? (Source: 1, 2, 9)			X		1, 2, 3, 10
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? (Source: 1, 2, 9)			X		1, 2, 3, 10
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? (Source: 1, 2, 9)				X	1, 2, 3, 10

Approach to Analysis

Fort Ord Habitat Management Plan

The U.S. Army's decision to close and dispose of the Fort Ord military base was considered a major federal action that could affect listed species under the ESA. In 1993, the Service issued a Biological Opinion (BO) on the disposal and reuse of former Fort Ord requiring that a habitat management plan be developed and implemented to reduce the incidental take of listed species and loss of habitat that supports these species. The Fort Ord Habitat Management Plan (HMP) was prepared to assess impacts on vegetation and wildlife resources and provide mitigation for their loss associated with the disposal and reuse of former Fort Ord.

The HMP establishes guidelines for the conservation and management of species and habitats on former Fort Ord lands by identifying lands that are available for development, lands that have some restrictions with development, and habitat reserve areas. The intent of the plan is to establish large, contiguous habitat conservation areas and corridors to compensate for future development in other areas of the former base. The HMP identifies what type of activities can occur on each parcel at former Fort Ord; parcels are designated as "development with no restrictions," "habitat reserves with management requirements," "habitat corridors," or "habitat reserves with development restrictions." The HMP sets the standards to assure the long-term viability of the former Fort Ord's biological resources in the context of base reuse so

that no further mitigation should be necessary for impacts to species and habitats considered in the HMP. This plan has been approved by U.S. Fish and Wildlife Service (Service); the HMP, deed restrictions, and Memoranda of Agreement between the Army and various land recipients provide the legal mechanism to assure HMP implementation. It is a legally binding document, and all recipients of former Fort Ord lands are required to abide by its management requirements and procedures.

The HMP anticipates some losses to special-status species and sensitive habitats as a result of redevelopment of the former Fort Ord. With the designated reserves and corridors and habitat management requirements in place, the losses of individuals of species and sensitive habitats considered in the HMP are not expected to jeopardize the long-term viability of those species, their populations, or sensitive habitats on former Fort Ord. Recipients of disposed land with restrictions or management guidelines designated by the HMP will be obligated to implement those specific measures through the HMP and through deed covenants.

However, the HMP does not provide specific authorization for incidental take of federal or state listed species to existing or future non-federal land recipients under the federal Endangered Act (ESA) or California Endangered Species Act (CESA). As such, impacts to federal and state listed species require acquisition of a Section 7 or 10 ITP from the Service and/or a Section 2081 ITP from the CDFW.

The project sites are located within designated "development" parcels. Parcels designated as "development" have no management restrictions. However, the 2017 Programmatic BO and HMP require the identification of sensitive botanical resources within the development parcels that may be salvaged for use in restoration activities in reserve areas. In addition, the HMP requires that land recipients prepare and implement Resource Management Plans (RMP) and Borderland Management Plans (BMP) for specified parcels within their respective jurisdictions.

Impact Analysis

The following impact analysis addresses direct and indirect impacts that may result from implementation of the proposed project. Direct impacts are those effects of a project that occur at the same time and place of project implementation, such as removal of habitat from ground disturbance. Indirect impacts are those effects of a project that occur either later in time or at a distance from the project location but are reasonably foreseeable, such as loss of excessive erosion caused by vegetation removal. Direct and indirect impacts can also vary in duration and result in temporary, short-term, and long-term effects on biological resources. A temporary effect would occur only during the activity. A short-term effect would last from the time an activity ceases to some intermediate period of approximately one to five years (i.e., repopulation of habitat following restoration). A long-term or permanent effect would last longer than five years after an activity ceases. Long-term effects may include the ongoing maintenance and operation of a project or may result in a permanent change in the condition of a resource, in which case it could be considered a permanent impact.

The project sites are located within parcels designated as "development" under the approved Fort Ord HMP (Parcel Numbers L24, S1.1.2, E4.5, E2c.4.1.1, and S1.2.1). As described above, parcels designated as "development" have no development restrictions or habitat management requirements. However, the 2017 Programmatic BO and HMP require the identification of sensitive botanical resources within these parcels that may be salvaged for use in restoration activities in reserve areas. Within all parcels, the HMP recommends preservation of native vegetation and HMP species habitat outside of areas identified for

development. Impacts to HMP species and habitats occurring within the designated development parcels were anticipated and mitigated through the establishment of habitat reserves and corridors and the implementation of habitat management requirements within habitat reserve parcels on former Fort Ord.

The HMP species that are known or have a moderate to high potential to occur within the study areas include Monterey ornate shrew, California tiger salamander (CTS), Northern California legless lizard, sandmat manzanita, Monterey spineflower, sand gilia, and Monterey ceanothus. With the designated habitat reserves and corridors and habitat management requirements of the HMP in place, the loss of these species is not expected to jeopardize the long-term viability of these species and their populations on the former Fort Ord. This is such because the recipients of disposed land with development restrictions or habitat management requirements under the HMP are obligated to implement those specific measures through the HMP and deed covenants. In addition to the HMP species identified, impacts to maritime chaparral habitat are also addressed in the HMP and, therefore, impacts to this habitat are also considered mitigated through the implementation of the HMP based on the same conclusions. The proposed project is:

1. Located within designated "development" parcels;
2. Required to comply with the habitat management restrictions identified in the HMP; and
3. Would not result in any additional impacts to HMP species and habitats beyond those anticipated in the HMP.

The City and CSUMB are required to implement HMP requirements in accordance with the deed covenants that apply to the project sites. The HMP and 2017 Programmatic BO require the identification of sensitive biological resources within development parcels that may be salvaged for use in restoration activities in habitat reserve areas. In addition, the HMP requires that land recipients prepare and implement RMPs and BMPs for specified parcels within their respective jurisdictions. While the proposed project would occur in designated development parcels, the City and CSUMB are required to have approved RMPs and BMPs for the specified parcels in their jurisdiction in order to be considered in compliance with the HMP. If the City and CSUMB are in compliance with the HMP and 2017 Programmatic BO, impacts to these special-status species are considered less than significant and no additional mitigation measures for these HMP species would be required.[3] However, if the City and/or CSUMB are not in compliance with the HMP and 2017 Programmatic BO, then impacts to HMP species may be considered significant and additional mitigation measures may be required.

However, as described above, the HMP does not exempt existing or future land recipients from the federal and state requirements of ESA and CESA. Of the HMP species known or with the potential to occur within the study areas, there are two federal and/or state listed species that would require take authorization from the resource agencies (Service and/or CDFW) if impacts would occur as a result of the proposed project: sand gilia, federal endangered and state threatened; and CTS, federal and state threatened. Therefore, although these species are HMP species, the take of these species is prohibited under the ESA and/or CESA. Development resulting in take of these species would need to be authorized by the Service and/or CDFW through the issuance of incidental take permits from the applicable agency to avoid violation under the ESA and/or CESA.

[3] With the exception of species that require take authorization.

Where suitable habitat exists within the study areas, the proposed project has the potential to impact special-status species that were not addressed in the HMP. The non-HMP species that are known or have a moderate to high potential to occur within and may be impacted by the project include: Fort Ord spineflower, Monterey dusky-footed woodrat, coast horned lizard, coast range newt, and nesting raptors and other protected avian species.

Explanation

a) **Less-Than-Significant Impact with Mitigation.**

Existing BPS Study Area

HMP Special-Status Species

The Existing BPS study area is located within HMP parcels E4.3.11 and E4.5, which are designated as "development." Five HMP special-status species are known or have the potential to occur within the study area at the Existing BPS study area: Monterey ceanothus, sand gilia, and sandmat manzanita, Monterey ornate shrew, and Northern California legless lizard.

Construction activities at the Existing BPS study area would involve the relocation of a generator inside the existing building and installation of a new pipeline within the Imjin Parkway and California Avenue ROW (i.e., within existing pavement). No vegetation removal or disturbance would occur and impacts to these species would be avoided. Any future demolition and/or decommissioning activities at this site are not included as part of the proposed project. Therefore, no impacts to the five HMP special-status species would occur.

Non-HMP Special-Status Species

Suitable habitat for two non-HMP special-status species is present within the Existing BPS study area: the Monterey dusky-footed woodrat, coast horned lizard, and Coast Range newt. Additionally, nesting raptors and other protected avian species may occur. However, construction activities at the Existing BPS study area would involve the relocation of a generator inside the existing building and installation of a new pipeline within the Imjin Parkway and California Avenue road ROW (i.e., within existing pavement). No vegetation removal or disturbance would occur and impacts to these species would be avoided. As discussed above, any future demolition and/or decommissioning activities at this site are not included as part of the proposed project. Therefore, no impacts to non-HMP special-status species would occur.

Proposed BPS Study Area

HMP Special-Status Species

The Proposed B/C BPS study area is located within HMP parcels L5.8.1, L5.8.2, and S1.5.2, which are designated as "development." One HMP plant species (Monterey ceanothus) is known to occur within the Proposed B/C BPS study area. Additionally, one HMP wildlife species (Northern California legless lizard) has a high potential to occur within the undeveloped areas of the study area at this site.

Within the study area, Monterey ceanothus was observed at the intersection of 5th Avenue and 8th Street outside the existing percolation pond. However, no construction activities are proposed

within or adjacent to the percolation pond. No vegetation removal or disturbance would occur and impacts to this species would be avoided. The proposed project would involve adding a flow-spitting manhole in 5th Avenue within existing pavement, to prevent surcharging the storm drain if an overflow should occur during a large rain event. If such an event occurred, the pond has sufficient capacity to capture an overflow without directly or indirectly affecting the Monterey ceanothus, which are located along the top perimeter of the pond. Therefore, no impacts to this species would occur.

Suitable habitat for the Northern California legless lizard is present within the vegetated areas that would be impacted by construction of the A1/A2 reservoirs and B/C BPS. Construction activities could result in impacts to this species, including loss of individuals, soil compaction, dust, loss of habitat, erosion, and introduction and spread of non-native, invasive species. This is a potentially significant impact.

As described in the "Approach to Analysis" section, impacts to special-status species addressed in the HMP within development parcels are considered less than significant if the City and/or CSUMB are in compliance with the HMP and 2017 Programmatic BO. The 2017 Programmatic BO and HMP require the identification of sensitive botanical resources within the development parcels that may be salvaged for use in restoration activities in reserve areas. In addition to the salvage requirements, although the proposed project would occur in designated development parcels, the City and/or CSUMB are required to have approved RMPs and BMPs for the identified parcels in their jurisdiction in order to be considered in compliance with the HMP. If the City and/or CSUMB are in compliance with the requirements of the HMP and 2017 Programmatic BO, impacts to the Northern California legless lizard within the Proposed B/C BPS study area would be less than significant and no additional mitigation is required.

However, in the event that the City and/or CSUMB are not in compliance with the HMP and 2017 Programmatic BO, **Mitigation Measures BIO-1** through **BIO-3** have been identified to mitigate for potential impacts to the Northern California legless lizard. These measures include implementing construction best management practices, monitoring, and invasive species controls, would reduce potentially significant impacts to this species to a less-than-significant level. Implementation of **Mitigation Measures BIO-1** through **BIO-3** would reduce potentially significant impacts to the Northern California legless lizard in the event that the City and/or CSUMB are not in compliance with the HMP and 2017 Programmatic BO.

Therefore, potential impacts to HMP special-status species at the Proposed BPS study area would be reduced to a less-than-significant level with implementation of **Mitigation Measures BIO-1** through **BIO-3**.

Non-HMP Special-Status Species

Suitable habitat for two non-HMP special-status species is present within the Proposed B/C BPS study area: the coast horned lizard and Coast Range newt. Additionally, nesting raptors and other protected avian species may be present. Project implementation could result in direct impacts to individuals and loss of habitat for these species. Construction-related activities (e.g., removal of vegetation, equipment noise, vibration) could also result in raptor and protected avian species nest abandonment. These are potentially significant impacts.

Implementation of **Mitigation Measures BIO-1** through **BIO-4**, which avoid and minimize impacts through implementing construction best management practices, monitoring, invasive species controls, and pre-construction surveys would reduce potentially significant impacts to these species to a less-than significant-level.

Therefore, potential impacts to non-HMP special-status species at the Proposed BPS study area would be reduced to a less-than-significant level with implementation of **Mitigation Measures BIO-1** though **BIO-4**.

Intermediate Reservoir and Ord Wellfield Study Area

HMP Special-Status Species

The Intermediate Reservoir and Ord Wellfield study area is located within HMP parcel S1.2.1, which is designated as "development." Three HMP wildlife species (i.e., Monterey ornate shrew, CTS, and Northern California legless lizard) have a moderate to high potential to occur within suitable habitat in the study area at this site.

However, construction activities at the Intermediate Reservoir and Ord Wellfield study area would primarily occur within existing developed and ruderal/disturbed areas. Ground disturbance for construction activities at the Intermediate Reservoir, F BPS, and Ord Wellfield Chlorination Building would be less than 1,000 sf to install valves and vaults, run new conduits, and add a service tap, primarily within the existing dirt and gravel roadways. The remaining improvements would occur within developed areas and would not require ground disturbance (i.e., replace generator and altitude valve, recoat water tank, and update SCADA system).

As a result, potential impacts to suitable habitat for HMP wildlife species would be avoided and impacts to these HMP wildlife species would be less than significant. However, because CTS is listed under ESA and CESA, **Mitigation Measure BIO-5**, which requires construction surveys and monitoring, is identified to further reduce potential impacts to this species and avoid take under Section 10 and Section 2081 of the ESA and CESA.

One HMP plant species (Monterey spineflower) was identified within the study area during the surveys in 2019; however, two additional HMP plant species (sandmat manzanita and sand gilia) have a moderate potential to occur within the unsurveyed portion of the study area. Construction activities could result in impacts to these species, including loss of individuals, soil compaction, dust, loss of habitat, erosion, and introduction and spread of non-native, invasive species. This is a potentially significant impact.

Mitigation Measure BIO-6 would be implemented to identify the presence of Monterey spineflower, sandmat manzanita, and sand gilia within unsurveyed portion of the Intermediate Reservoir and Ord Wellfield study area. If these HMP plant species are identified, implementation of **Mitigation Measure BIO-6** would reduce potential impacts to a less-than-significant level by requiring pre-construction surveys, salvage, avoidance, compliance with the CESA (as applicable), and replacement of impacted plant species at a 1:1 ratio and implementation of a Rare Plant Restoration Plan (if not in compliance with the HMP and 2017 Programmatic BO).

As described in the "Approach to Analysis" section, impacts to special-status species addressed in the HMP within development parcels are considered less than significant if the City is in compliance with the HMP and 2017 Programmatic BO. The 2017 Programmatic BO and HMP require the identification of sensitive botanical resources within the development parcels that may be salvaged for use in restoration activities in reserve areas. Implementation of **Mitigation Measure BIO-7** would ensure compliance with the salvage requirements identified in the HMP and 2017 Programmatic BO. In addition to the salvage requirements, although the proposed project would occur in designated development parcels, the City is required to have approved RMPs and BMPs for the identified parcels in their jurisdiction in order to be considered in compliance with the HMP. If the City is in compliance with the requirements of the HMP and 2017 Programmatic BO, impacts to HMP species within the Intermediate Reservoir and Ord Wellfield study area would be less than significant and no additional mitigation is required.[4]

However, in the event that the City is not in compliance with the requirements of the HMP and 2017 Programmatic BO, **Mitigation Measure BIO-8** has been identified to mitigate for potential impacts to Monterey spineflower (as well as sandmat manzanita and sand gilia, if determined present and would be impacted by the proposed project). This measure includes replacement of impacted plant species at a 1:1 ratio and implementation of a Rare Plant Restoration Plan. Implementation of **Mitigation Measure BIO-8** would reduce potentially significant impacts to Monterey spineflower (as well as sandmat manzanita and sand gilia, if determined present and would be impacted by the proposed project) in the event that the City is not in compliance with the HMP and 2017 Programmatic BO.

In addition, although sand gilia is a HMP species, it is also listed under the ESA and CESA. The HMP does not exempt existing or future land recipients from the federal and state requirements of ESA and CESA and impacts to this species would be considered a significant impact even with implementation of **Mitigation Measures BIO-9** and **BIO-10**. As described in Section 2.5 "Regulatory Setting," if there is the potential for incidental take of a state listed plant species, take of the listed species can be authorized through the incidental take permit process. Therefore, if the proposed project would result in impacts to sand gilia, the MCWD would be required to comply with the CESA by retaining an incidental take permit from the CDFW.

Implementation of **Mitigation Measures BIO-1** through **BIO-3** have been identified to reduce potentially significant impacts to the Northern California legless lizard; however, these HMP species would also benefit from the implementation of these measures. These measures would reduce construction-related impacts through a combination of protective measures during all phases of construction, education, monitoring, and invasive species controls and further reduce impacts to these species.

Therefore, potential impacts to HMP special-status species resulting from proposed activities within the Intermediate Reservoir and Ord Wellfield study area would be reduced to a less-than-significant level with implementation of **Mitigation Measures BIO-5** through **BIO-10**. Implementation of **Mitigation Measures BIO-1** through **BIO-3** would further reduce impacts to these species.

[4] With the exception of species that require take authorization.

Non-HMP Special-Status Species

Suitable habitat for the following non-HMP special-status species is present within the Intermediate Reservoir and Ord Wellfield study area: Monterey dusky-footed woodrat, coast horned lizard, and coast range newt. Additionally, nesting raptors and other protected avian species have the potential to occur.

However, construction activities at the Intermediate Reservoir and Ord Wellfield study area would primarily occur within existing developed and ruderal/disturbed areas and is not proposed within suitable habitat for Monterey dusky-footed woodrat, coast horned lizard, and coast range newt. Ground disturbance for construction activities at the Intermediate Reservoir, F BPS, and Ord Wellfield Chlorination Building would be less than 1,000 sf to install valves and vaults, run new conduits, and add a service tap, primarily within the existing dirt and gravel roadways. The remaining improvements would occur within developed areas and would not require ground disturbance (i.e., replace generator and altitude valve, recoat water tank, and update SCADA system). As a result, potential impacts to suitable habitat for Monterey dusky-footed woodrat, coast horned lizard, and coast range newt would be avoided and impacts would be less than significant.

No trees or other suitable nest habitat are proposed for disturbance or removal at the Intermediate Reservoir and Ord Wellfield study area. However, construction-related activities (e.g., removal of vegetation, equipment noise, vibration) adjacent to trees and other suitable nesting habitat could result in raptor and protected avian species nest abandonment. This is a potentially significant impact. Implementation of **Mitigation Measures BIO-4** which requires pre-construction surveys would reduce potentially significant impacts to nesting raptors and other protected avian species to a less-than-significant level.

Mitigation Measure BIO-6 would be implemented to identify the presence of Fort Ord spineflower within unsurveyed portion of the Intermediate Reservoir and Ord Wellfield study area. If this species is identified, implementation of **Mitigation Measure BIO-6** would reduce potential impacts to a less-than-significant level by requiring pre-construction surveys, avoidance, and replacement of impacted plant species at a 1:1 ratio and implementation of a Rare Plant Restoration Plan.

Implementation of **Mitigation Measures BIO-1** through **BIO-3** have been identified to reduce potentially significant impacts to the Northern California legless lizard; however, these species would also benefit from the implementation of these measures. These measures would reduce construction-related impacts through a combination of protective measures during all phases of construction, education, monitoring, and invasive species controls and further reduce impacts to these species.

Therefore, potential impacts to non-HMP special-status species resulting from proposed activities within the Intermediate Reservoir and Ord Wellfield study area would be less than significant with implementation of Mitigation Measures BIO-4 and BIO-6. Implementation of **Mitigation Measures BIO-1** through **BIO-3** would further reduce impacts to these species.

Mitigation Measure BIO-1: Construction Best Management Practices

The following best management practices will be implemented during all identified phases of construction (i.e., pre-, during, and post-) to reduce impacts to special-status plant and wildlife species:

- A qualified biologist will conduct an Employee Education Program for the construction crew prior to any construction activities. The qualified biologist will meet with the construction crew at the onset of construction at the project site to educate the construction crew on the following: 1) the appropriate access route(s) in and out of the construction area and review project boundaries; 2) how a biological monitor will examine the area and agree upon a method which will ensure the safety of the monitor during such activities, 3) the special-status species that may be present; 4) the specific mitigation measures that will be incorporated into the construction effort; 5) the general provisions and protections afforded by the Service and CDFW; and 6) the proper procedures if a special-status species is encountered within the project site.
- Protective fencing shall be placed prior to and during construction to keep construction equipment and personnel from impacting vegetation outside of work limits. A biological monitor shall supervise the installation of protective fencing and monitor at least once per week until construction is complete to ensure that the protective fencing remains intact.
- Trees and vegetation not planned for removal or trimming shall be protected prior to and during construction to the maximum extent possible through the use of exclusionary fencing, such as hay bales for herbaceous and shrubby vegetation, and protective wood barriers for trees. Only certified weed-free straw shall be used, to avoid the introduction of non-native, invasive species. A biological monitor shall supervise the installation of protective fencing and monitor at least once per week until construction is complete to ensure that the protective fencing remains intact.
- Grading, excavating, and other activities that involve substantial soil disturbance will be planned and implemented in consultation with a qualified hydrologist, engineer, or erosion control specialist, and will utilize standard erosion control techniques to minimize erosion and sedimentation to native vegetation adjacent to the project site (pre-, during, and post-construction).
- Following construction, disturbed areas will be restored to pre-project contours to the maximum extent possible and revegetated using locally-occurring native species and native erosion control seed mix, per the recommendations of a qualified biologist.
- To protect against spills and fluids leaking from equipment, the project proponent shall require that the construction contractor maintains an on-site spill plan and on-site spill containment measures that can be easily accessed.
- No firearms will be allowed on the project site at any time.
- All food-related and other trash will be disposed of in closed containers and removed from the project area at least once a week during the construction period, or more often if trash is attracting avian or mammalian predators. Construction personnel will not feed or otherwise attract wildlife to the area.

Mitigation Measure BIO-2: Construction-Phase Monitoring

MCWD shall retain a qualified biologist to monitor all ground disturbing construction activities (i.e., vegetation removal, grading, excavation, or similar activities) associated with the project to protect any special-status species encountered. Any handling and relocation protocols of special-status wildlife species will be determined in coordination with CDFW prior to any ground disturbing activities and will be conducted by a qualified biologist with appropriate scientific collection permit. After ground disturbing project activities are complete, the qualified biologist will train an individual from the construction crew to act as the on-site construction biological monitor. The construction biological monitor will be the contact for any special-status wildlife species encounters, will conduct daily inspections of equipment and materials stored on site and any holes or trenches prior to the commencement of work, and will ensure that all installed fencing stays in place throughout the construction period. The qualified biologist will then conduct regular scheduled and unscheduled visits to ensure the construction biological monitor is satisfactorily implementing all appropriate mitigation protocols. Both the qualified biologist and the construction biological monitor must work through the State Inspector to cease construction contractor work and/or redirect project activities to ensure protection of resources and compliance with all environmental permits and conditions of the project. The qualified biologist and the construction monitor shall complete a daily log summarizing activities and environmental compliance throughout the duration of the project. The log will also include any special-status wildlife species observed and relocated.

Mitigation Measure BIO-3: Non-Native, Invasive Species Controls

The following measures will be implemented to reduce the introduction and spread of non-native, invasive species:

- Any landscaping or replanting required for the project will not use species listed as noxious by the California Department of Food and Agriculture (CDFA) or invasive by the California Invasive Plant Council (Cal-IPC).
- Bare and disturbed soil will be landscaped with CDFA recommended seed mix or plantings from locally adopted species to preclude the invasion on noxious weeds in the project site.
- Construction equipment will be cleaned of mud or other debris that may contain invasive plants and/or seeds and inspected to reduce the potential of spreading noxious weeds, before mobilizing to arrive at the construction site and before leaving the construction site.
- All non-native, invasive plant species will be removed from disturbed areas prior to replanting.

Mitigation Measure BIO-4: Pre-Construction Surveys for Nesting Raptors and Avian Species

Construction activities that may directly (e.g., vegetation removal) or indirectly (e.g., noise/ground disturbance) affect nesting raptors and avian species will be timed to avoid the breeding and nesting season. Specifically, vegetation and/or tree removal can be scheduled after September 16 and before January 31. Alternatively, a qualified biologist will be retained by the project applicant to conduct pre-construction surveys for nesting raptors and other

protected avian species within 500 feet of proposed construction activities if construction occurs between February 1 and September 15. Pre-construction surveys will be conducted no more than 14 days prior to the start of construction activities during the early part of the breeding season (February through April) and no more than 30 days prior to the initiation of these activities during the late part of the breeding season (May through August). Because some bird species nest early in spring and others nest later in summer, surveys for nesting birds may be required to continue during construction to address new arrivals, and because some species breed multiple times in a season. The necessity and timing of these continued surveys will be determined by the qualified biologist based on review of the final construction plans and in coordination with the CDFW, as needed.

If raptors or other protected avian species nests are identified during the pre-construction surveys, the qualified biologist will notify the project applicant and an appropriate no-disturbance buffer will be imposed within which no construction activities or disturbance should take place (generally 500 feet in all directions for raptors; other avian species may have species-specific requirements) until the young of the year have fledged and are no longer reliant upon the nest or parental care for survival, as determined by a qualified biologist.

Mitigation Measure BIO-5: California Tiger Salamander Avoidance Measures

The following measures will be implemented to avoid impacts to CTS at the Intermediate Reservoir and Ord Wellfield site:

- A Service and CDFW-approved biologist will monitor initial ground disturbing construction activity for a sufficient amount of time to train an individual to act as the on-site construction monitor. This would typically take two days. The determination of when the construction monitor is sufficiently trained to act independently shall be made by the qualified biologist and may be less or more than two days. The construction monitor will have attended the training described below. Both the Service and CDFW-approved biologist and the construction monitor will have the authority to stop and/or redirect project activities to ensure protection of resources and compliance with all environmental permits and conditions of the project. The construction monitor is not authorized to capture or handle CTS. The construction monitor will complete a daily log summarizing activities and environmental compliance.
- Before ground disturbing work activities begin each day, the construction monitor will conduct a pre-construction survey and inspect under construction equipment and materials to look for CTS. If a CTS is found during these checks or during construction, the construction monitor will halt work that may affect the animal until the Service and CDFW-approved biologist is notified. The Service and CDFW-approved biologist will notify the Service and CDFW of any CTS encounters within 48 hours. The MCWD will consult with the Service and CDFW to ensure compliance with the ESA and CESA and obtain any necessary permits.
- A Service and CDFW-approved biologist will train all project staff regarding habitat sensitivity, identification of special-status species, and required practices before the start of construction. The training will include a brief review of the biology of the covered species, the general measures that are being implemented to conserve these species as they

relate to the project, guidelines to avoid impacts to these species during the construction period, the penalties for non-compliance, and the boundaries of the project area. A fact sheet or other supporting materials containing this information will be prepared and distributed. Upon completion of training, employees will sign a form stating that they attended the training and understand all the conservation and protection measures. Educational programs will be conducted for new personnel before they join construction activities. The crew foreman will be responsible for ensuring that all crew members comply with the guidelines.

- Work will be postponed if chance of rain is greater than 70% based on the NOAA National Weather Service forecast or within 48 hours following a rain event greater than 0.1 inch. If an unpredicted rainfall event commences while construction activities are in progress, the applicant will suspend all work activities and equipment and personnel will be demobilized. Equipment may be moved to a designated staging area until work is allowed to resume. The designated area will be a hard surface devoid of small mammal burrows. A Service and CDFW-approved biologist would survey the project site immediately before resuming project activities.
- The project site and driveway will be closed to all construction activities and traffic one half hour before sunset and will not begin prior to one half hour after sunrise.
- All construction-related vegetative debris (e.g., larger brush, tree limbs, tree trunks) will be hauled offsite daily for disposal.
- To prevent inadvertent entrapment of CTS during construction, all excavated, steep-walled holes or trenches more than two (2) feet deep will be covered at the close of each working day with plywood or similar materials. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If holes or trenches are too large to be covered, the construction crew will place adequate means of escape (earthen ramps not more than 2:1 slope, wooden boards, etc.) to allow animals to exit.
- During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.
- All refueling, maintenance, and staging of equipment and vehicles will occur at least 100 feet from water bodies and in a location from where a spill would not drain directly toward aquatic habitat (e.g., on a slope that drains away from the water). The construction monitor will ensure contamination of habitat does not occur during such operations. Prior to the onset of work, the contractor will ensure that a plan is in place for prompt and effective response to any accidental spills. All workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.
- Only tightly woven fiber netting or similar material may be used for erosion control at the project site. Coconut coir matting is an acceptable erosion control material. No plastic

mono-filament matting will be used for erosion control, as this material may ensnare wildlife, including.

Mitigation Measure BIO-6: Pre-Construction Special-Status Plant Surveys

A qualified biologist shall be retained to conduct pre-construction surveys for sandmat manzanita, Monterey spineflower, Fort Ord spineflower, and sand gilia within the unsurveyed portion of the Intermediate Reservoir and Ord Wellfield site. The surveys shall be conducted during the appropriate identification period(s) to determine presence or absence, according to USFWS, CDFW, and CNPS protocol. The biologist shall prepare a report that provides the results of the survey, and, if found the number and locations of individuals/populations identified.

- If no special-status plant species are identified, no further mitigation is necessary.
- If special-status HMP plant species are identified, **Mitigation Measures BIO-7** through **BIO-10** shall be implemented, as appropriate.
- If special-status non-HMP plant species are identified, impacts to these individuals or populations shall be avoided through project design and modification to the extent feasible. If avoidance is not feasible, a Rare Plant Restoration Plan shall be prepared by a qualified biologist and implemented. The plan shall include, but is not limited to, the following:
    - A description of the baseline conditions of the work site, including locations and densities of the special-status plant species present;
    - Procedures to control and/or eliminate non-native invasive species within the work site;
    - A detailed description of on-site and/or off-site restoration areas, salvage of seed and/or soil bank, plant salvage, seeding and planting specifications, including increased planting ratio to ensure the 1:1 success ratio; and
    - A monitoring program that describes annual monitoring efforts which incorporate success criteria and contingency plans if success criteria are not met.

Mitigation Measure BIO-7: HMP Plant Species Salvage

Prior to construction, salvage efforts for HMP species that do not require take authorization from the USFWS or CDFW will be evaluated by a qualified biologist in coordination with the to further reduce impacts per the requirements of the HMP and 2017 Programmatic BO. Where salvage is determined feasible and proposed, seed collection should occur from plants within the development site and/or topsoil should be salvaged within occupied areas to be disturbed. Seeds should be collected during the appropriate time of year for each species by qualified biologists. The collected seeds and topsoil should be used to revegetate temporarily disturbed construction areas and reseeding and restoration efforts on- or off-site, as determined appropriate by the qualified biologist and MCWD. For HMP species that require take authorization from the USFWS or CDFW, any additional salvage measures identified in the take authorization(s) shall be followed.

Mitigation Measure BIO-8: HMP and 2017 Programmatic BO Compliance

If the City and/or CSUMB are not in compliance with the HMP and the 2017 Programmatic BO, impacts to sandmat manzanita and Monterey spineflower shall be replaced at a 1:1 success ratio for the acreage or individuals impacted (depending on species impacted) and a Rare Plant Restoration Plan shall be prepared by a qualified biologist and implemented. The plan shall include, but is not limited to, the following:

- A description of the baseline conditions of the habitats within the work site, including the presence of any special-status species, their locations, and densities;
- Procedures to control and/or eliminate non-native invasive species within the work site;
- Provisions for ongoing training of facility maintenance personnel to ensure compliance with the requirements of the plan;
- A detailed description of on-site and/or off-site restoration areas, salvage of seed and/or soil bank, plant salvage, seeding and planting specifications, including increased planting ratio to ensure the 1:1 success ratio; and
- A monitoring program that describes annual monitoring efforts which incorporate success criteria and contingency plans if success criteria are not met.

Mitigation Measure BIO-9: Federal and State Listed Plant Species Avoidance

Federal and state listed plant species shall be avoided to the greatest extent feasible. Individuals or populations that will not be impacted by the project shall be protected prior to and during construction to the maximum possible through the use of exclusionary fencing and/or flagging. A biological monitor will supervise the installation of protective fencing/flagging and monitor at least once per week until construction is complete to ensure that the protective fencing/flagging remains intact.

Mitigation Measure BIO-10: CESA Compliance

The MCWD will comply with the CESA and obtain necessary take authorizations if sand gilia is identified in the unsurveyed portion at the Intermediate Reservoir and Ord Wellfield site during the pre-construction surveys required in **Mitigation Measure BIO-6** and it is determined that avoidance is not feasible and the project may result in take, as defined in the CESA.

The MCWD will obtain an incidental take permit from CDFW prior to take occurring at the site. Permit requirements typically involve preparation and implementation of a mitigation plan and mitigating impacted habitat at a 3:1 ratio through preservation and/or restoration. The MCWD would be required to retain a qualified biologist to prepare the mitigation plan, which will include, but is not limited to, identifying avoidance and minimization measures; mitigation strategy, including a take assessment, compensatory mitigation lands, and success criteria; and funding assurances. MCWD would be required to implement the approved mitigation plan and any additional permit requirements.

b) **No Impact.** Maritime chaparral is the only habitat listed as sensitive on the CDFW's *California Natural Communities List* that occurs within the Existing BPS study area. As described above,

construction activities at the Existing BPS site would involve the relocation of a generator inside the existing building and installation of a new pipeline within the Imjin Parkway and California Avenue ROW (i.e., within existing pavement). No vegetation removal or disturbance would occur and impacts to these species would be avoided. Any future demolition and/or decommissioning activities at this site are not included as part of the proposed project. Therefore, no impacts to maritime chaparral would occur.

c) **No Impact.** There are no state or federally protected wetlands present within or adjacent to the study areas. Therefore, no impact would occur.

d) **Less-Than-Significant Impact.** Wildlife movement corridors are pathways or habitat linkages that connect discrete areas of natural open space otherwise separated or fragmented by topography, changes in vegetation, and other natural or man-made factors, such as urbanization. The fragmentation of natural habitat creates isolated "islands" of vegetation that may not provide sufficient area or resources to accommodate sustainable populations for a number of species, and, therefore, adversely affect both genetic and species diversity. Corridors often partially or largely mitigate the adverse effects of fragmentation by 1) allowing animals to move between remaining habitats to replenish depleted populations and increase the gene pool available; 2) providing escape routes from fire, predators, and human disturbances, thus reducing the risk that catastrophic events (e.g., fire and disease) would result in population or species extinction; and 3) serving as travel paths for individual animals moving throughout their home range in search of food, water, mates, and other needs, or for dispersing juveniles in search of new home ranges.

The 2010 Monterey County General Plan EIR identified a number of significant wildlife movement corridors and linkages within the vicinity of the former Fort Ord, including Linkage 308: Fort Ord – Ventana; Linkage 322: Highway 68 Western Crossing; Linkage 350: Sierra de Salinas – Toro Peak; Linkage 339: Salinas Valley Floor; and Linkage 378: Salinas River – Pinnacles National Monument (County of Monterey, 2010). Of particular importance for wildlife movement from the former Fort Ord lands to outlying areas are Linkages 308 and 322. Specifically, Linkage 322 runs along El Toro Creek in the southeastern portion of former Fort Ord and through a large, bridge undercrossing Highway 68. This corridor has been identified as a significant wildlife corridor for mammals, amphibians, and reptiles moving between former Fort Ord lands and connecting to the Sierra de Salinas and Santa Lucia Ranges.

The HMP considered conservation area connectivity as an essential component of the design of the conservation areas and corridors within the former Fort Ord. The HMP created conservation areas and corridors with the purpose of linking the plant and animal populations in the northern portion of the former base at the Marina Municipal Airport to the populations in the south to the Fort Ord National Monument and the El Toro Creek undercrossing of Highway 68. The implementation of the HMP preserves over 18,500 acres of a variety of habitats supporting a variety of common and special-status plant species, and maintains a north-south wildlife corridor across the former Fort Ord lands to connect with the primary, significant wildlife linkages.

The Existing BPS and Proposed B/C BPS sites are not located within any of the significant wildlife movement corridors or linkages identified above. These sites are located in the City of Marina, and in part within CSUMB, and are surrounded by new and remnant housing developments at California Avenue and Imjin Parkway, structures associated with CSUMB, and roadways. As such,

although portions of these sites are undeveloped, these areas are currently isolated from other undeveloped areas and provide little use as a corridor for wildlife movement. The implementation of the proposed project would involve impacts to vegetative communities at these project sites; however, the proposed project would impact only a small percentage of natural habitat within the former Fort Ord. The HMP preserves approximately 18,500 acres of large, contiguous areas of wildlife habitat that will remain on the former Fort Ord and will be preserved in perpetuity. Therefore, the proposed activities within the Existing BPS and Proposed B/C BPS sites would not disconnect, fragment, or otherwise impeded wildlife movement in the primary, significant wildlife movement corridors in the area. This is a less-than-significant impact.

The Intermediate Reservoir and Ord Wellfield site is located within City's jurisdiction within an existing MCWD easement, partially surrounded by housing with existing security fencing that prevent people and large wildlife species, such as deer, from entering the site. Small wildlife that are able to pass over or through the fencing, such as birds, rodents, and reptiles, may utilize the undeveloped areas as habitat while moving through the site. The implementation of the proposed project would involve minimal impacts to vegetative communities at the Intermediate Reservoir and Ord Wellfield site; however, the proposed project would impact only a small percentage of wildlife habitat within the former Fort Ord. The HMP preserves approximately 18,500 acres of large, contiguous areas of wildlife habitat that will remain on the former Fort Ord and will be preserved in perpetuity. Therefore, the proposed activities within the Intermediate Reservoir and Ord Wellfield site would not disconnect, fragment, or otherwise impeded wildlife movement in the primary, significant wildlife movement corridors in the area. This is a less-than-significant impact.

As a result, the development of the proposed project would not disconnect, fragment, or otherwise impeded wildlife movement in the primary, significant wildlife movement corridors between the former Fort Ord lands and other lands. This is a less-than-significant impact. No mitigation is required.

e) **Less-than-Significant Impact**. Implementation of the project would result in impacts to trees within CSUMB campus boundaries at the Proposed BPS site; tree removal is not proposed at the other two project sites. CSUMB has established a tree restoration program for impacts to coast live oak and other trees resulting from projects that take place on campus. This program requires that for trees with a four-inch dbh or greater removed, a minimum of two coast live oak trees would be replanted in the identified restoration area on campus. The implementation of this program is required for all projects that would result in impacts to trees. Therefore, as a feature of the project design, two coast live oak trees would be replanted for every tree with a greater than four-inch dbh removed. The replanting specifications would be required in final project plans. Therefore, the potential to conflict with the CSUMB tree restoration program is less than significant. Trees within and adjacent to the project sites not planned for removal will be protected prior to and during construction through the implementation of exclusionary fencing as required in **Mitigation Measure BIO-1**.

f) **Less-Than-Significant Impact.** The project sites are not located within an approved HCP or NCCP area. However, the project sites are located within the Fort Ord HMP boundaries and is designated for development (with no restrictions). As described in the "Approach to Analysis," the

proposed project is consistent with the approved HMP. This is a less-than-significant impact and no mitigation is required.

Conclusion: The proposed project would have a less-than-significant impact on biological resources with implementation of the mitigation measures identified above.

5.2.5 CULTURAL RESOURCES

Setting

Evidence from coastal areas of Monterey County suggests settlement by at least 5,000 B.C. and possibly earlier. According to the City's General Plan, several areas of the City contain significant archaeological resources associated with occupation and settlement of the area. The City's General Plan has identified areas of moderate to high archaeological sensitivity in the City, these areas include: 1) the terraces and benches along the Salinas River; 2) the peripheries of vernal pools; and 3) coastal beaches.

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
CULTURAL RESOURCES. Would the project:					
a) Cause a substantial adverse change in the significance of a historical resource as defined in CEQA 15064.5? (Source: 1, 2, 10)				X	1, 2, 3, 4, 11
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA 15064.5? (Source: 1, 2, 10)		X			1, 2, 3, 4, 11
c) Disturb any human remains, including those interred outside of formal cemeteries? (Source: 1, 2, 10)		X			1, 2, 3, 4, 11

Explanation

a) **No Impact.** No listed or known potential National Register of Historic Places and/or California Register of Historical Resources are located in or adjacent to the proposed Area of Potential Effects (APE). No other significant or potentially significant local, state or federal cultural resources/historic properties, landmarks, points of interest, etc. have been identified in or adjacent to the project APE. Therefore, no impacts would result to historical resources as defined in CEQA 15064.5.

b, c) **Less-Than-Significant Impact with Mitigation.** The construction of the proposed project would occur within primarily developed and paved areas. Any archaeological resources would likely have been unearthed at the time of original disturbance to the site. Further, the City's General Plan does not identify any archaeologically significant sites within the vicinity of any of the proposed project sites. No known archaeological resources or human remains have been documented at the proposed project sites. However, no subsurface testing for buried archaeological resources was completed, and, therefore, there is the possibility of inadvertently uncovering human remains during

construction. The potential inadvertent discovery of archaeological resources and/or human remains and potential inadvertent damage or disturbance during construction is considered a potentially significant impact. This impact can be mitigated to a less-than-significant level with the implementation of **Mitigation Measure CR-1 and CR-2**.

Mitigation Measure CR-1

If archaeological materials or features are discovered at any time during construction, work shall be halted within 50 meters (150 ft.) of the find until it can be evaluated by a qualified professional archaeologist (defined as one who is certified by the Society of Professional Archaeologists). If the find is determined to be significant, appropriate mitigation measures shall be formulated and implemented.

Mitigation Measure CR-2

If human remains are discovered at any time during construction, work shall be halted within 50 meters (150 ft.) of the find.

- The contractor shall call the Monterey County Coroner and await the Coroner's clearance. If the coroner determines the remains are Native American, the Coroner shall contact the Native American Heritage Commission (NAHC) within 24 hours.
- NAHC shall notify the most likely descendent.
- The Native American descendent, with permission of the landowner or representative, may inspect the site of the discovery and recommend the means for treating or disposing with appropriate dignity the human remains and any associated grave goods.
- The Native American descendent shall complete their inspection and make their recommendation within 24 hours of their notification by the Native American Heritage Commission. The recommendation may include the removal and analysis of human remains and associated items; preservation of the Native American human remains and associated items in place; relinquishment of Native American human remains and associated items to the descendants for treatment; or other culturally appropriate treatment. If the NAHC is unable to identify a descendent or the descendent identified fails to make a recommendation within 24 hours, the landowner shall reinter the human remains and items associated with the Native American burials with appropriate dignity on the property in a location not subject to further subsurface disturbance.
- If the landowner and Native American descendent reach agreement on the appropriate procedure, the landowner shall follow this procedure.
- If the landowner and Native American descent cannot reach agreement, the parties shall consult with the Native American Heritage Commission. The landowner shall consider and, if agreeable, follow the identified procedure.
- If the landowner and Native American descendant cannot reach agreement after consultation, the Native American human remains shall be reinterred on the property with appropriate dignity.

Conclusion: The proposed project would have a less-than-significant impact on cultural resources with implementation of the mitigation measures identified above.

5.2.6 ENERGY

Setting

Starting in 2018, all PG&E customers within Monterey, San Benito, and Santa Cruz Counties were automatically enrolled in Central Coast Community Energy (3CE) (formally Monterey Bay Community Power). 3CE is a locally-controlled public agency providing carbon-free electricity to residents and businesses. Formed in February 2017, 3CE is a joint powers authority, and is based on a local energy model called community choice energy. 3CE partners with PG&E, which continues to provide billing, power transmission and distribution, customer service, grid maintenance services and natural gas services to Monterey County. 3CE's standard electricity offering, is carbon free and is classified as 30 percent renewable. Of the electricity provided by 3CE in 2018, 40 percent was hydroelectric, and 30 percent was solar and wind (eligible renewables) (3CE, 2019).

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
6. ENERGY. Would the project:					
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? (Source: 1, 2)			X		1, 2, 3
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? (Source: 1, 2)			X		1, 2, 3

Explanation

a) **Less-Than-Significant Impact**. Since the proposed project would involve a replacement BPS and A1/A2 reservoir, the energy use consumed by the proposed project would be generally consistent with the previous usage of the existing BPS and reservoir. The replacement system would only consist of electricity consumption; no natural gas usage is proposed. A discussion of the project's effect on energy use is presented below.

Construction. The anticipated construction schedule assumes that the proposed project would be completed over a period of approximately 24 months. The construction phase would require energy for the manufacture and transportation of building materials, preparation of the site (e.g., excavation, and grading), and the actual construction of project components. Petroleum-based fuels such as diesel fuel and gasoline would be the primary sources of energy for these tasks. The construction energy use has not been determined at this time. However, the proposed project would not cause inefficient, wasteful, or unnecessary consumption of energy as the construction schedule and process is already designed to be efficient in order to avoid excess monetary costs. Equipment and fuel are not typically used wastefully during construction due to the added expenses associated

with renting, maintaining, and fueling the equipment. Hand tools would be used when possible in order to avoid use of heavy machinery. Furthermore, energy used required to complete construction would be limited and short-term.

Operational. Operation of the proposed new facilities would consume energy primarily for operation of the pumps and lighting. Since the proposed project would involve a replacement BPS and A1/A2 reservoir, the energy use consumed by the proposed project would be generally consistent with the previous usage of the existing BPS and reservoir. The proposed project does not anticipate a significant increase in energy use. As a result, implementation of the proposed project would not result in a substantial environmental impact on energy resources. The proposed project would not result in an increase in traffic to/from the site as traffic required for maintenance activities associated with the proposed project would be consistent with the existing usage. Therefore, implementation of the proposed project would not result in a substantial increase on transportation-related energy use.

Based on the discussion above, the proposed project would not result in potentially significant environmental impact, during operation or construction, due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation.

b) **Less-Than-Significant Impact**. The construction and operation of the proposed project would have a less-than-significant impact due to energy usage and efficiency and, thus, would not conflict with local or state plans for energy efficiency. Furthermore, design of the proposed replacement BPS would use minimal energy (i.e., no natural gas and minimal electricity for pumps and lighting). As a result, the project would comply with existing state energy standards and would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Conclusion: The project would have less-than-significant impacts related to energy use.

5.2.7 GEOLOGY AND SOILS

Setting

A Geotechnical Report was prepared for the proposed A1/A2 Reservoirs and B/C BPS by Cornerstone Earth Group (August 26, 2019) (**Appendix B**). The proposed activities at the Existing BPS site would involve the relocation of a generator inside the existing building and installation of a new pipeline within the Imjin Parkway and California Avenue right-of-way (ROW) (i.e., within existing pavement). The proposed project would include updates to the existing SCADA system, replace the altitude valve, and recoat at the Intermediate Reservoir. Improvements on the Ord Community wellfield disinfection system at the Chlorination Building include adding a flow meter on the wellfield main, and variable speed drives on the dosing pumps. Typically, these types of activities do not necessitate a geotechnical investigation due to the limited ground disturbance required and nature of proposed updates to existing structures. As a result, this section focuses on the geotechnical analysis of the proposed new reservoirs and B/C BPS.

Subsurface Conditions

Subsurface soils in the lower parking lot to the north of the landscape berm encountered during subsurface explorations consists of dense poorly graded sand to a depth of nine feet, underlain by medium dense poorly graded sand with silt, underlain by very dense poorly graded sand to the maximum depth explored of 30

feet beneath the surface. Subsurface soils in the upper parking lot to the south of the landscape berm encountered during subsurface explorations consists of dense to very dense poorly graded sand, underlain by medium dense poorly graded sand with silt. The subsurface soils are silty and poorly graded sands with about 16 percent or less fines passing the No. 200 sieve. These soils are non-plastic and have very low expansion potential. Detailed descriptions of the subsurface materials are provided in boring logs presented in **Appendix B**.

Groundwater

During subsurface exploration, groundwater was not encountered in current borings drilled to a maximum depth of 51 ½ feet below existing grades. Additionally, groundwater was not encountered in the previous 2007 borings to a maximum depth of 76 ½ feet below sites grades. Groundwater levels are not currently mapped at the site by the State of California. The GeoTracker website was reviewed regarding groundwater depths in the site area. Based on this review, there is no available data within the site area. Fluctuations in groundwater levels occur due to many factors including seasonal fluctuation, underground drainage patterns, regional fluctuations, and other factors. Based on the available data, it is anticipated that depth to groundwater to be greater than 50 feet beneath the site.

Assessment of Potential Geologic Hazards

Localized Faulting. The site is not located within a currently delineated State of California Alquist-Priolo Earthquake Fault Zone. No known active faults have been identified on the site or project towards the site; thus, the potential for future surface fault rupture at the site is considered to be low.

Flood Hazard. The Federal Emergency and Management Administration (FEMA) maintain a collection of Flood Insurance Rate Maps (FIRM), which cover the entire U.S. These maps identify those areas which may be subjected to 100-year and 500-year cycle floods. Based on review of these maps, the site is in an area zoned as Zone X, described as an "Area of minimal flood hazard."

Liquefaction and Seismic Settlement. The term liquefaction describes a phenomenon in which saturated, cohesionless or very low plasticity soils temporarily lose shear strength (liquefy) due to increased pore water pressures induced by strong, cyclic ground motions during an earthquake. Structures founded on or above potentially liquefiable soils may experience bearing capacity failures due to the temporary loss of foundation support, vertical settlements (both total and differential), and/or undergo lateral spreading. The factors known to influence liquefaction potential include age, soil type, relative density, grain size, plasticity, confining pressure, depth to groundwater, and the intensity and duration of the seismic ground shaking. Liquefaction is most prevalent in young loose to medium dense, non-plastic coarse-grained soils below the groundwater table. The site is not currently mapped by the State of California but is within a zone mapped as having a low liquefaction potential. The subsurface soils at the site are not considered susceptible to liquefaction or significant seismically-induced settlement due to the depth of groundwater and density of the soils at depth.

Lateral Spreading. Lateral spreading is horizontal/lateral ground movement of relatively flat-lying soil deposits towards a free face such as an excavation, channel, or open body of water, typically lateral spreading is associated with liquefaction of one or more subsurface layers near the bottom of the exposed slope. As failure tends to propagate as block failures, it is difficult to analyze and estimate where the first tension crack will form. The potential for liquefaction to occur at the site is very low; therefore, the potential for lateral spreading is also very low.

Tsunami and Seiche. The site is not mapped within a State-designated tsunami inundation area. The site is approximately 11/3 miles inland from the Monterey Bay shoreline and is approximately 180 to 200 feet above mean sea level; therefore, the potential for inundation due to tsunami or seiche is considered low.

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
GEOLOGY AND SOILS. Would the project:					
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:					
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. (Source: 1, 2, 3, 11)			X		1, 2, 3, 12
ii) Strong seismic ground shaking? (Source: 1, 2, 3, 11)			X		1, 2, 3, 12
iii) Seismic-related ground failure, including liquefaction? (Source: 1, 2, 3, 11)			X		1, 2, 3, 12
iv) Landslides? (Source: 1, 2, 3, 11)			X		1, 2, 3, 12
b) Result in substantial soil erosion or the loss of topsoil? (Source: 1, 2, 3, 11)			X		1, 2, 3, 12
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? (Source: 1, 2, 3, 11)			X		1, 2, 3, 12
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property? (Source: 1, 2, 3, 11)			X		1, 2, 3, 12
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? (Source: 1, 2, 3, 11)				X	1, 2, 3, 12
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? (Source: 1, 2, 3, 11)				X	1, 2, 3, 12

Explanation

ai) **Less-Than-Significant Impact**. The project sites are not located within a State of California Earthquake Fault Hazard Zone and no known active faults cross the site. The project sites are not mapped within an Alquist-Priolo Earthquake Fault Zone. Potential effects associated with the rupture of known faults are discussed separately below; please refer to Response a.ii for more information. This represents a less-than-significant impact.

aii) **Less-Than-Significant Impact**. Although the project sites are not located within a State of California Earthquake Fault Hazard Zone and no known active faults cross the site, the project sites are located in a seismically active region. The reservoir tanks are to be designed and constructed in accordance with AWWA D100-11 and the pump station is to be designed and constructed in accordance with the 2019 California Building Code (CBC). Furthermore, the proposed project would be constructed to standard engineering and seismic safety design techniques. The proposed project would be designed and constructed in accordance with all state, federal, and other laws, rules, regulations to avoid or minimize potential direct or indirect damage from seismic ground shaking. In addition, the proposed project does not include habitable structures thereby further reducing the risk of loss, injury, or death. This is considered a less-than-significant impact.

aiii) **Less-Than-Significant Impact**. The project sites are located in an area of low liquefaction potential. As described above, the project sites may be subject to strong ground shaking in the event of a major earthquake and would be required to incorporate the recommendations provided by the geotechnical investigation. The proposed project would be designed and constructed in accordance with all state, federal, and other laws, rules, regulations to avoid or minimize potential direct or indirect damage from seismic related ground failure, including liquefaction. This is considered a less-than-significant impact.

aiv) **Less-than-Significant Impact**. The project sites have no appreciable vertical relief and is mapped by the City's General Plan as in an area of low landslide potential. The potential for landslides is low and this is considered a less-than-significant impact. See also aiii) above.

b) **Less-Than-Significant Impact**. The sands encountered at the project site consist of fine to medium sands with fine contents generally less than 15 percent. These types of soils are highly subject to erosion from wind and water. All exposed surfaces would be vegetated or otherwise protected from erosion.

The proposed project would be subject to the requirements of the Regional Water Quality Control Board (RWQCB) National Pollution Discharge Elimination System (NPDES) Program General Storm Water Permit, which includes the preparation of a Storm Water Pollution Prevention Plan (SWPPP), as outlined in Section 5.2.10, Hydrology and Water Quality, for construction activities disturbing one acre or more. Any temporary erosion related to construction would be minimized through the implementation of standard construction phase best management practices (BMPs) related to erosion. Erosion control measures and associated BMPs would be consistent with the recommended measures contained in the California Stormwater Best Management Practices Handbooks. Applicable measures may include the following:

- Stockpiling and disposing of demolition debris, concrete, and soil.
- Protecting existing storm drain inlets and stabilizing disturbed areas.
- Hydroseeding/re-vegetating disturbed areas.
- Minimizing areas of impervious surfaces.
- Implementing runoff controls (e.g., percolation basins and drainage facilities).
- Properly managing construction materials.

- Managing waste, aggressively controlling litter, and implementing sediment controls.
- Limiting grading to the minimum area necessary for construction and operation of the project.

Compliance with City and state requirements, and the above BMPs would ensure that construction activities associated with the proposed project would not cause substantial soil erosion under CEQA and potential erosion related impacts would be reduced to a less-than-significant level.

c) **Less-Than-Significant Impact**. The potential for lateral spreading, subsidence, or liquefaction, which could damage proposed structures, is considered low at the project sites. Impacts associated with these soil and geotechnical hazards would be minimized by applying appropriate engineering and construction techniques. This would reduce any potentially significant geotechnical impacts to a less-than-significant level.

d) **Less-Than-Significant Impact**. The proposed project sites may contain expansive soils, which could damage proposed structures on the sites. Impacts associated with expansive soils or other soil hazards would be minimized by applying appropriate engineering and construction techniques. This would reduce any potentially significant geotechnical impacts to a less-than-significant level.

e) **No Impact**. The proposed project does not propose any septic tanks or alternative wastewater disposal system.

f) **No Impact**. There are no known paleontological resources or unique geologic features on the project site. The project sites are not listed within an area identified as containing paleontological resources nor are they located in close proximity to any known paleontological resources. The proposed project would not impact any paleontological resources since none are known in the project area.

Conclusion: The proposed project would have a less-than-significant impact on geology and soils.

5.2.8 GREENHOUSE GAS EMISSIONS

Setting

Various gases in the earth's atmosphere, classified as atmospheric greenhouse gases (GHGs), play a critical role in determining the earth's surface temperature. Solar radiation enters the atmosphere from space and a portion of the radiation is absorbed by the earth's surface. The earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, the radiation that otherwise would have escaped back into space is retained, resulting in a warming of the atmosphere known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect, or climate change, are carbon dioxide (CO_2), methane (CH_4), O_3, water vapor, nitrous oxide (N_2O), and chlorofluorocarbons (CFCs). Human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for enhancing the greenhouse effect. In California, the transportation sector is the largest emitter of GHGs.

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
GREENHOUSE GAS EMISSIONS. Would the project:					
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? (Source: 1, 2)			X		1, 2, 3
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases? (Source: 1, 2)			X		1, 2, 3

Explanation

a) **Less-Than-Significant Impact**. Implementation of the proposed project would contribute GHG emissions that are associated with global climate change. GHG emissions attributable to future development would be primarily associated with increases of CO_2 and, to a lesser extent, other GHG pollutants, such as CH_4 and N_2O. The major sources of GHG emissions associated with the project include emissions during construction and mobile sources.

The project is located in the NCCAB, where air quality is regulated by MBARD. Neither the state, MBARD, nor Monterey County have adopted GHG emissions thresholds or a GHG emissions reduction plan that would apply to the project. However, it is important to note, that other air districts within the State of California have adopted recommended CEQA significance thresholds for GHG emissions. For instance, on March 28, 2012 the San Luis Obispo Air Pollution Control District (SLOAPCD) approved thresholds of significance for the evaluation of project-related increases of GHG emissions. The SLOAPCD's significance thresholds include both qualitative and quantitative threshold options, which include a qualitative threshold that is consistent with the AB 32 scoping plan measures and goals and a quantitative bright-line threshold of 1,150 metric tons of carbon dioxide equivalent (MTCO2e) per year. The GHG significance thresholds are based on AB 32 GHG emission reduction goals, which take into consideration the emission reduction strategies outlined in the California Air Resources Board's Scoping Plan. Development projects located within these jurisdictions that would exceed these thresholds would be considered to have a potentially significant impact on the environment which could conflict with applicable GHG-reduction plans, policies and regulations. Projects with GHG emissions that do not exceed the applicable threshold would be considered to have a less-than-significant impact on the environment and would not be anticipated to conflict with AB 32 GHG emission reduction goals. Given that the MBARD has not yet adopted recommended GHG significance thresholds, the above thresholds were relied upon for evaluation of the proposed project.

As discussed in Section 5.2.3, Air Quality, above, operation and construction of the proposed project would not exceed established thresholds for air quality emissions. The proposed project would replace the existing facilities and would not significantly increase operational energy demand beyond existing use. The proposed project would generate temporary construction-related GHG emissions, with most of the emissions generated during the grading phase of construction, which would be minimal and is not anticipated to generate GHG emissions in excess of the above

thresholds. Construction would generate two round trip truck trips per day. The largest traffic day would be concrete replacement for the buildings, which anticipates 20 ready-mix delivery trucks. Operational activities would consist of the maintenance of the project site, and would include one pick-up truck daily, and up to five additional single-vehicle visits per month. Additionally, six larger truck trip per year would be required for pump motor maintenance and generator fueler. As such, the proposed project would not generate substantial new or altered sources of GHGs emissions. Any potential impacts from GHG generation during construction would be short-term and temporary. As a result, the proposed project is not anticipated to generate GHG, either directly or indirectly, that may have a significant impact on the environment.

b) **Less-Than-Significant Impact**. Neither the state, MBARD, nor Monterey County have adopted GHG emissions thresholds or a GHG emissions reduction plan that would apply to the project. However, as shown above, the proposed project is not expected to generate GHG emissions that would exceed applicable thresholds. The proposed project would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases as described above. This represents a less-than-significant impact.

Conclusion: The proposed project would have a less-than-significant impact related to GHG emissions.

5.2.9 HAZARDS AND HAZARDOUS MATERIALS

Setting

Hazardous materials, as defined by the CCR, are substances with certain physical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed, or otherwise managed. A hazardous waste is any hazardous material that is discarded, abandoned, or slated to be recycled. Hazardous materials and waste can result in public health hazards if improperly handled, released into the soil or groundwater, or through airborne releases in vapors, fumes, or dust. Soil and groundwater having concentrations of hazardous constituents higher than specific regulatory levels must be handled and disposed of as hazardous waste when excavated or pumped from an aquifer.

The proposed project would involve the construction of the proposed A1/A2 Reservoirs and B/C BPS and associated improvements and updates to the Existing B/C BPS site and Intermediate Reservoir site. It would not create new hazards, nor would it handle or release hazardous materials. The project sites are not located within the vicinity of hazardous waste facilities. The project sites are located on the former Fort Ord, and, although the project sites are not specifically identified, the entire former Fort Ord is included on the Federal National Priority List (NPL), also known as the Superfund list. Fort Ord was established in 1917 and closed in 1994. Multiple groundwater plumes exist within the former military base from multiple source areas and consist of chlorinated volatile organic compounds (VOCs). Groundwater plumes exist under each of the proposed project sites. The plumes have been evaluated, monitored, and remediated.

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
HAZARDS AND HAZARDOUS MATERIALS. Would the project:					
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? (Source: 1, 2)		X			1, 2
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? (Source: 1, 2)		X			1, 2
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school? (Source: 1, 2)			X		1, 2
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? (Source: 1, 2)			X		1, 2
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area? (Source: 1, 2)			X		1, 2
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? (Source: 1, 2)				X	1, 2
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires? (Source: 1, 2)			X		1, 2, 4

Explanation

a, b) **Less-Than-Significant Impact with Mitigation.** Construction and operation of the proposed project would not create a significant impact due to routine transport, use, or disposal of hazardous materials. No hazardous materials are anticipated to be stored on site during operation of the proposed project. Construction activities would, however, require the temporary use of hazardous substances, such as fuel for construction equipment, oil, solvents, or paints. In addition, there is also low possibility of a wastewater spill during construction. As a result, the proposed project could result in the exposure of persons and/or the environment to an adverse environmental impact due to the accidental release of a hazardous material. These materials would be handled and stored in compliance with all local, state, and federal regulations pertaining to hazardous materials. In addition, the following mitigation would minimize potential impacts to less than significant.

Mitigation Measure HAZ-1: Spill Prevention and Control Plan

Prior to commencement of construction-related activities, the MCWD or Contractor shall prepare a Spill Prevention and Control Plan that addresses potential impacts associated with

hazardous material usage during construction and operation. The Spill Prevention and Control Plan shall, at a minimum, consist of the following:

- Identify applicable safety and clean-up procedures in the event of a spill.
- Designate construction staging areas where hazardous materials may be stored. All staging areas shall be located outside of sensitive biological areas. Staging areas shall be designed to contain runoff to prevent contaminants (e.g., oil, grease, fuel products, etc.) from draining towards receiving waters and sensitive areas.
- Identify appropriate emergency notification procedures and emergency contacts.
- Designated location where a spill kit shall be maintained on-site throughout the project.
- Identify dedicated storage areas where hazardous material may be stored and/or used during construction

The MCWD or Contractor will be responsible for implementing the Spill Prevention and Control Plan on-site for the duration of construction, and all personnel working on the site would be notified of its location.

With the incorporation of the above mitigation measure, as well as local, state, and federal regulations and agreements, impacts related to accidental release of a hazardous materials would be less than significant.

c) **Less-Than-Significant Impact**. The project sites are located on CSUMB property or within ¼ mile of a school. However, operation of the proposed project would not routinely emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste. This represents a less-than-significant impact.

d) **Less-Than-Significant Impact**. The proposed project is located on the former Fort Ord, which is includes on the Federal National Priority List (NPL), also known as the Superfund list. However, the project sites are not listed on the "Cortese" Hazardous Waste & Substance Sites List compiled pursuant to Government Code Section 65962.5. However, due to the sites historical use as part of a former military installation, construction activities within these areas have the potential to encounter unexploded ordnance which, if not identified and properly handled, could cause injury or death to construction workers.

The project sites have already undergone remediation actions and have been transferred to the local land jurisdictions. In order for any ground disturbance activities to commence, the MCWD and its contractors must comply with the City of Marina Municipal Code Chapter 15.56, Digging and Excavation on the Former Fort Ord. This ordinance establishes special standards and procedures for digging and excavation on those properties in the former Fort Ord military base which are suspected of containing ordnance and explosives (also called munitions and explosives of concern). This ordinance requires that a permit be obtained from the City for any excavation, digging, development, or ground disturbance of any type involving the displacement of ten cubic yards or more of soil. Compliance with existing regulations for construction work at the former Fort Ord would reduce the potential impact of encountering unexploded ordnance by construction workers to less than significant.

e) **Less-than-Significant Impact**. The Intermediate Reservoir site is located approximately ¾ mile southwest of the Marina Municipal Airport; the other two project sites are located over two miles from the airport. However, the proposed updates to the facilities at the Intermediate Reservoir site would not result in a safety hazard or excessive noise for people residing or working in the project area. This represents a less-than-significant impact.

f) **No Impact.** The proposed project would not impede emergency response or evacuation plans, as it is not part of vehicular transportation network used by emergency vehicles. Therefore, no impact would occur.

g) **Less-Than-Significant Impact**. The project sites are not located within a state responsibility area, as designated by the California Department of Forestry and Fire Protection (Cal Fire). While vegetation occurs adjacent to each of the project sites, no habitable structures are proposed (also see Section 5.2.20, Wildfire). This represents a less-than-significant impact.

Conclusion: The proposed project would have a less-than-significant impact related to hazards and hazardous materials with incorporated mitigation measure identified above.

5.2.10 HYDROLOGY AND WATER QUALITY

Setting

The project sites do not contain any natural drainages, waterways, or other aquatic features. The Flood Insurance Rate Maps issued by the Federal Emergency Management Agency (FEMA) indicate that the project sites are located within Zone X (unshaded). Zone X is described as an "Area of minimal flood hazard."

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
HYDROLOGY AND WATER QUALITY. Would the project:					
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality? (Source: 1, 2)		X			1, 2, 3
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? (Source: 1, 2)			X		1, 2, 3
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:			X		1, 2, 3
i) Result in substantial erosion or siltation on- or off-site;			X		1, 2, 12

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;			X		1, 2, 3
iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or			X		1, 2, 3
iv) impede or redirect flood flows? (Source: 1, 2)				X	1, 2, 3
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation? (Source: 1, 2, 3)				X	1, 2, 4
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? (Source: 1, 2)			X		1, 2, 3

Explanation

a) **Less-Than-Significant Impact with Mitigation**. Temporary soil disturbance would occur during construction of the proposed project as a result of earth-moving activities, such as excavation and trenching for utilities, soil compaction and moving, cut and fill activities, and grading. If not managed properly, disturbed soils would be susceptible to high rates of erosion from wind and rain, resulting in sediment transport via stormwater runoff from the project site. Moreover, the proposed project would increase the extent of impervious surfaces on the site thereby potentially generating additional sources of polluted runoff. The types of pollutants contained in runoff would be typical of urban areas, and may include sediments and contaminants such as oils, fuels, paints, and solvents. Additionally, other pollutants, such as nutrients, trace metals, and hydrocarbons, can attach to sediment and be transported to downstream drainages and ultimately into collecting waterways, contributing to degradation of water quality.

As stated above in Section 5.2.7, Geology and Soils, the proposed project would disturb more than one acre of soil. As a result, the proposed project would be required to obtain coverage under the RWQCB NPDES General Storm Water Permit. The permit would require a SWPPP, which contains BMPs for construction and post construction runoff. BMPs that are typically specified within the SWPPP may include, but would not be limited to the following:

- The use of sandbags, straw bales, and temporary de-silting basins during project grading and construction during the rainy season to prevent discharge of sediment-laden runoff into storm water facilities.
- Revegetation as soon as practicable after completion of grading to reduce sediment transport during storms.
- Installation of straw bales, wattles, or silt fencing at the base of bare slopes before the onset of the rainy season (October 15th through April 15th).
- Installation of straw bales, wattles, or silt fencing at the project perimeter and in front of storm drains before the onset of the rainy season (October 15th through April 15th).

Project operation could result in similar water quality effects (e.g. temporary erosion, hazardous material leakages, etc.). Potential water quality effects could occur in connection with on-going operations, including the operation of mechanized equipment, maintenance activities, and increased vehicle access within the site. These activities could cause localized increases in erosion and sedimentation, as well as the accidental release of hazardous materials and chemicals used in facility operation. This represents a potentially significant impact. Mitigation identified in Section 5.2.9, Hazards and Hazardous Materials (**Mitigation Measure HAZ-1: Spill Prevention and Control Plan**) and compliance with the BMPs and applicable regulations discussed in Section 4.2.7., Geology and Soils would minimize potential impacts to a less-than-significant level. Furthermore, the project would comply with applicable regulations and laws to ensure proper discharge into the City's stormwater infrastructure, as described below. Potential water quality impacts from operations would, therefore, be less than significant.

b) **Less-Than-Significant Impact**. Based on the available data, it is anticipated that depth to groundwater to be greater than 50 feet beneath the project vicinity. The proposed project would be a replacement and upgrade to existing facilities, and would not result in an increase in water demand or substantially decrease groundwater supplies. The proposed project sites are primarily developed and paved, and the proposed facilities and improvements would not substantially increase the amount of impervious surfaces that would interfere with groundwater recharge. This represents a less-than-significant impact.

ci) **Less-Than-Significant Impact**. Construction of the project would require grading activities that could result in a temporary increase in erosion affecting the quality of storm water runoff. The project would be required to obtain a NPDES General Construction Activities Permit. The MCWD would develop, implement, and maintain a SWPPP to control the discharge of stormwater pollutants including sediments associated with construction activities. This stormwater permit would be administered by the RWQCB.

The proposed project would not substantially increase the amount of impervious surfaces. However, the construction of the proposed reservoirs and B/C BPS would slightly modify the drainage pattern on-site. Consistent with the regulations and policies described above, the proposed project would follow the standard permit conditions associated with the NPDES Permit.

In conclusion, the proposed project would not substantially alter existing drainage patterns, cause alteration of streams or rivers, or result in substantial erosion or siltation on or off site by complying with the state's Construction Stormwater Permit. This represents a less-than-significant impact.

cii) **Less-Than-Significant Impact**. The proposed project site for the A1/A2 reservoirs and B/C BPS is located on a developed parcel that is currently serving as a parking lot and would not result in a substantial increase in impervious surface. The proposed project would implement a stormwater control plan to manage runoff from the site. Runoff would be collected in the adjacent stormwater detention basin. As a result, the proposed project would have a less-than-significant impact associated with flooding on- or off-site due to increased surface runoff.

ciii) **Less-Than-Significant Impact**. The project proposes to connect to convert the existing C-Zone to an A-Zone transmission main to supply the new reservoirs, therefore, would not provide a source of polluted runoff. The project is not expected to contribute runoff that would exceed the capacity

of existing or planned stormwater drainage systems or result in substantial additional sources of polluted runoff. See also Response ci, above. This represents a less-than-significant impact.

civ) **No Impact**. The project sites are located outside the 100-year floodplain, as mapped by FEMA (site is within Flood Zone X) and would not significantly impede or redirect flood flows. Therefore, no impact would occur.

d) **No Impact**. As described above, the project sites are not located within a 100-year floodplain or flood hazard zone. In addition, the project sites are not located in an area subject to significant seiche or release of pollutants due to project inundation. The project sites are not located within the Tsunami Inundation Zone. The risk associated with tsunamis is, therefore, not considered a potential hazard. Therefore, no impact would occur.

e) **Less-Than-Significant Impact**. The proposed project would be required to comply with the NPDES permit conditions, as well as standard BMPs during construction. As described above, the proposed project would not result in significant water quality or groundwater quality impacts that would conflict or obstruct implementation of a water quality control or sustainable groundwater management plan since, as outlined above.

Conclusion: The proposed project would have a less-than-significant impact on hydrology and water quality with implementation of the mitigation measure identified above.

5.2.11 LAND USE

Setting

The City's General Plan designates the proposed project areas as follows:

- Proposed A1/A2 Reservoirs and B/C BPS site: Public Facilities with a small portion designated as Parks and Recreation;
- Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building site: Habitat Preserve and Other Open Space; and,
- Existing B/C BPS site: Parks and Recreation.

While within city limits, a portion of the proposed A1/A2 Reservoirs and B/C BPS site is located on the CSUMB campus, and the 2007 Master Plan designates the site as Surface Parking.

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
LAND USE AND PLANNING. Would the project:					
a) Physically divide an established community? (Source: 1, 2)				X	1, 2, 3
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? (Source: 1, 2)			X		1, 2, 3, 4, 5

Explanation

a) **No Impact**. The proposed project involves the construction of the proposed reservoirs and B/C BPS, and associated improvements and updates to the Existing B/C BPS site and Intermediate Reservoir site. The proposed activities are located within primarily developed sites and do not involve any barriers that would divide an established community. Therefore, no impact would occur.

b) **Less-Than-Significant Impact**. The proposed project would not conflict with any applicable land use plan, policy, or regulation adopted for the purposes of avoiding and/or mitigating an adverse environmental effect. In addition to the proposed project being consistent with relevant planning documents, the construction of reservoirs and B/C BPS would be consistent with current zoning and land use designations. The proposed project would be required to obtain a number of approvals and permits, listed in Section 2.6 Project Approval and Permits, which would further ensure consistency with applicable regulations. As a result, the proposed project is not anticipated to conflict with any policies adopted for the purposes of avoiding and/or substantially lessening an adverse impact. This represents a less-than-significant impact.

Conclusion: The proposed project would have a less-than-significant impact on land use and planning.

5.2.12 MINERAL RESOURCES

Setting

In accordance with the Surface Mining and Reclamation Act of 1975 (SMARA), the California Geological Survey (CGS) maps the regional significance of mineral resources throughout the state, with priority given to areas where future mineral resource extraction could be precluded by incompatible land use or to mineral resources likely to be mined during the 50-year period following their classification. The CGS delineates Mineral Resource Zones (MRZs) based on their mineral resource potential.

The project site is classified MRZ-2 which applies to areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists of their presence.

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
MINERAL RESOURCES. Would the project:					
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? (Source: 1, 2)			X		1, 2, 3, 4
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan? (Source: 1, 2)			X		1, 2, 3, 4

Explanation

a, b) **Less-Than-Significant Impact**. Although the project site is classified MRZ-2 by the CGS, the project sites are located in developed areas and consistent with the applicable land use designations. Further, implementation of the proposed project would not result in any large-scale development or other activities requiring significant removal of the mineral deposits present. This represents a less-than-significant impact.

Conclusion: The proposed project would have a less-than-significant impact on mineral resources.

5.2.13 NOISE

Setting

In the context of this document, "noise" is defined as unwanted sound. The primary source of existing noise in the proposed project area is traffic on adjacent roadways. Policies in the City's General Plan identify noise standards to avoid conflicts between noise-sensitive uses and noise source contributors. The only significant source of noise in the project area is from traffic along the local roadways.

The project sites are located adjacent to residential uses, and, in the case of the proposed reservoirs and B/C BPS site, located on a campus. Sensitive receptors in the vicinity consist of residential uses ranging from 350 to 500 feet from the project sites.

The City has adopted a noise ordinance (MMC Chapter 9.24), which seeks to control noise by determining time periods when activities are allowed or prohibited. For example, excessive unnecessary or unusually loud construction noise activity before 7:00 a.m. or after 7:00 p.m. daily (except Saturday, Sunday, and holidays when the hours are before 9:00 a.m. and after 7:00 p.m.) are prohibited. The City's Municipal Code does not contain quantitative noise limits.

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
NOISE. Would the project result in					
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? (Source: 1, 2, 3)			X		1, 2, 3, 4
b) Generation of excessive groundborne vibration or groundborne noise levels? (Source: 1, 2)			X		1, 2, 3, 13
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? (Source: 1, 2)			X		1, 2, 3

Explanation

a) **Less-Than-Significant Impact**. The proposed project involves the construction and operation of the proposed reservoirs, B/C BPS, and associated infrastructure improvements at the Existing BPS site and Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building site.

Construction of the proposed project would result in short-term noise increases in the project vicinity. Noise impacts from construction activities depend on the type of construction equipment used, the timing and length of activities, the distance between the noise generating construction activities and receptors, and shielding. Construction of the proposed project is anticipated to require 24 months. Construction equipment would include, but would not be limited to, tracked excavator, backhoe, water truck, concrete trucks, dump trucks, flat-bed delivery trucks, vibratory compacters, asphalt paving equipment, and trailer-mounted bypass pumps.

Typical hourly average construction noise levels could be as loud as 75 - 80 decibels at a distance of $\pm$100 ft from the construction area during active construction periods (DOT, 2006). Noise associated with the construction of the project would be temporary and intermittent, and would be limited to weekdays between the hours of 7:00 a.m. and 7:00 p.m.

The A1/A2 Reservoirs and B/C BPS would be located approximately 400 feet from student housing and would not result in a significant increase in permanent ambient noise levels. Additionally, the generator would require a sound enclosure to reduce ambient noise levels. The improvements at the Existing BPS site and Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building site would be located between 300 and 500 feet from residential uses. However, the proposed improvements would not result in operational noise that would significantly increase the permanent ambient noise in the area. This represents a less-than-significant impact.

b) **Less-Than-Significant Impact**. Construction of the proposed project would generate temporary groundborne vibration. Construction activities would include site clearing and minimal vegetation removal, excavation, grading and trenching, and site preparation work.

Vibration amplitudes are usually expressed as peak particle velocity (PPV) or the velocity of a parcel (real or imaged) in a medium as it transmits a wave. The Federal Transit Authority has published standard vibration levels and peak particle velocities for construction equipment. As stated previously, sensitive receptors in the vicinity of the project consist of residential uses located approximately 300-500 feet from the project sites. **Table 5** identifies anticipated approximate velocity level at 25 ft and PPV for each type of equipment at a distance of 25, 50, and 400 ft.

Table 5
Vibration Velocities for Construction Equipment

Equipment	Approximate Velocity Level at 25ft (VdB)	Approximate PPV at 25ft (inches/second)	Approximate PPV at 50ft (inches/second)	Approximate PPV at 400ft (inches/second)
Pile Driving (sonic)	104	0.644	N/A[1]	0.006
Pile Driver (impact)	112	1.518	N/A[1]	0.015
Large Bulldozers	87	0.089	0.031	0.001
Small Bulldozer	58	0.003	0.001	0.000
Loaded Trucks	86	0.076	0.027	0.001
Jackhammer	79	0.035	N/A[1]	0.000

Note: Data reflects typical vibration level.
Source: U.S. Department of Transportation, *Transportation and Construction Vibration Guidance Manual,* September 2013.

The City does not have any policies regulating construction vibration, and, therefore, for purposes of this analysis, excessive groundborne vibration would be 0.3 PPV (as derived from the California Department of Transportation, 2013. *Transportation and Construction Vibration Guidance Manual*).[5] Ground disturbing activities associated with project grading could involve the operation of large and small bulldozers, vibratory compactors, and loaded trucks. As shown above, the vibration level associated with these types of equipment would attenuate to a maximum of approximately 0.003 inches per second at 25 ft, which would be barely perceptible and would be well under the threshold of 0.3 inches per second. Moreover, sheet-pile shoring may be installed around the lift station excavation using vibratory equipment. As such, vibration associated with the construction of the proposed project would not be excessive. For these reasons, this represents a less-than-significant impact.

c) **Less-than-Significant Impact**. The Intermediate Reservoir site is located approximately ¾ mile southwest of the Marina Municipal Airport; the other two project sites are located over two miles from the airport. The proposed project does not involve the construction of habitable structures or require full-time staff that would expose people residing or working in the project area to excessive noise levels. This represents a less-than-significant impact.

[5] While the proposed project is not subject to Caltrans regulations these groundborne vibration and noise thresholds are commonly used for projects in the State of California.

Conclusion: The proposed project would result in less-than-significant noise impacts.

5.2.14 POPULATION AND HOUSING

Setting

The proposed project involves the construction and operation of the proposed reservoirs, B/C BPS, and associated infrastructure improvements at the Existing BPS site and Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building site.

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
POPULATION AND HOUSING. Would the project:					
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? (Source: 1, 2)				X	1, 2, 3
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? (Source: 1, 2)				X	1, 2, 3

Explanation

a, b) **No Impact**. The proposed project involves the construction and operation of the proposed reservoirs, B/C BPS, and associated infrastructure improvements at the Existing BPS site and Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building site. The proposed project would not constitute a change which would induce substantial population growth in the area, nor would the project affect housing availability, or displace residents. Therefore, no impact to population and housing would occur.

Conclusion: The proposed project would have no impact on population and housing.

5.2.15 PUBLIC SERVICES

Setting

Fire Protection: Fire protection services are provided to the project sites by the Marina Fire Department. The City operates one fire station located at 211 Hillcrest Avenue that is located approximately three miles from the farthest project site by way of surface streets.

Police Protection: Police protection services are provided to the project site by the CSUMB University Police Department, located 0.5 miles west from the project site. Additionally, the City operates one police station which is located at 211 Hillcrest Avenue, which is located approximately three miles from the farthest project site by way of surface streets.

Schools: There are numerous educational facilities in proximity to proposed project, including schools located in the cities of Marina and Seaside. The proposed reservoir and B/C BPS site would be located on CSUMB property.

Parks: The Fort Ord Dunes State Park and the Monterey Bay Coastal Recreational Trail are located approximately 1.5 miles from the nearest project site. In addition, the Intermediate Reservoir site is located adjacent to open space.

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
PUBLIC SERVICES. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: (Source: 1, 2, 3)					
a) Fire protection?			X		1, 2, 3
b) Police protection?			X		1, 2, 3
c) Schools?				X	1, 2, 3
d) Parks?			X		1, 2, 3
e) Other public facilities?				X	1, 2, 3

Explanation

a, b) **Less-Than-Significant Impact**. The proposed project involves the construction and operation of the proposed reservoirs, B/C BPS, and associated infrastructure improvements at the Existing BPS site and Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building site. Although unlikely, University Police or City Police or Fire could be required to respond to construction-related emergency. However, the limited duration of construction and minimal long-term protection needs of the facilities would not result in the need for new or renovated facilities. Furthermore, the proposed project would add emergency and fire water storage in the A-Zone, improving community fire protection. This represents and less-than-significant impact.

c, e) **No Impact**. The proposed project is not considered a project that could induce population growth that would generate new students or impact other public facilities, such as libraries. As a result, the proposed project would have no physical impact on schools or other public facilities and would not require the construction of new or remodeled facilities.

d) **Less-Than-Significant Impact**. The proposed project would not be considered a project that would induce population growth that would impact parks. Therefore, the proposed project would have no physical impacts on parks and would not require the construction of new or remodeled facilities. Please refer to Section 5.2.15 Recreation**,** for further discussion.

Conclusion: The proposed project would have a less-than-significant impact on public services.

5.2.16 RECREATION

Setting

The Fort Ord Dunes State Park and the Monterey Bay Coastal Recreational Trail are located approximately 1.5 miles from the nearest project site. In addition, the Intermediate Reservoir site is located adjacent to open space.

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
RECREATION. Would the project:					
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? (Source: 1, 2)				X	1, 2, 3
b) Include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment? (Source: 1, 2)				X	1, 2, 3

Explanation

a, b) **No Impact**. Operational activities of the proposed project would not increase the use of existing neighborhood parks or require the construction of additional facilities. The proposed project is consistent with the current use and would not induce population growth that would generate new park users. Therefore, no impact to recreational facilities would occur.

Conclusion: The proposed project would have no impact on recreational facilities.

5.2.17 TRANSPORTATION

Setting

Regional access to the A1/A2 Reservoirs and B/C BPS site is provided from SR 1 onto Lighthouse Drive and General Jim Moore Boulevard. The site is located north of Inter-Garrison Road between 5th and 6th Avenues, and south of 8th Street. Regional access to the Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield site is provided from Reservation Road onto Imjin Parkway, which intersects Old County Road. Regional access to the Existing B/C BPS site is provided from SR 1 or Reservation Road onto Imjin Parkway or California Avenue.

Site access to the reservoirs and B/C BPS site would be through the existing parking lot east of the site. The City is agreeable to allow routine access across their adjacent Corporation Yard along the storm drain pipeline alignment for secondary access to the reservoirs and B/C BPS site. No new separate construction access roads would be needed. Work within roads would require traffic control and flagmen.

The installation of the new pipeline in Imjin Parkway and California Avenue at the Existing B/C BPS site would require excavation within City right-of-way. The MCWD would be responsible for obtaining an encroachment permit from the City prior to the start of construction. The encroachment permit would require a traffic control plan.

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
TRANSPORTATION/TRAFFIC. Would the project:					
a) Conflict with program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities? (Source: 1, 2, 3)			X		1, 2, 3
b) Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)? (Source: 1, 2)			X		1, 2, 3
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? (Source: 1, 2)			X		1, 2, 3
d) Result in inadequate emergency access? (Source: 1, 2, 3)			X		1, 2, 3

Explanation

a) **Less-Than-Significant Impact**. The implementation of the proposed project would involve construction of the proposed facilities at the three project locations and routine operation and maintenance activities. The proposed project would result in a temporary increase in traffic during construction. During construction, two round trip truck trips per day are expected. The largest traffic day would be concrete replacement for the buildings, which anticipates 20 ready-mix delivery trucks. Most days, eight to 20 employees are expected on the construction site per day depending on the activity. Concrete foundation placement would require up to 20 employees for approximately four to five days. This amount of traffic is not anticipated to affect current level of service in the area. Additionally, construction activities within roadways would require traffic control and flagmen. Operational activities would consist of the maintenance of the project site, and would include one pick-up truck daily, and up to five additional single-vehicle visits per month. Additionally, six larger truck trips per year would be required for pump motor maintenance and generator fueler. These would not be in excess of maintenance trips associated with the existing system and would not constitute a significant impact. The proposed project is anticipated to generate little to no pedestrian or bicycle traffic, or transit usage, due to the nature of the project (operation and maintenance of facilities), relative isolation of the project sites from population areas, and the lack of pedestrian facilities in the area. The proposed project would not represent a significant impact to pedestrian or bicycle circulation or represent a significant demand for, or impact to transit service. Therefore, the proposed project would not conflict with a program, plan, ordinance, or policy addressing the circulation system. This is a less-than-significant impact.

b) **Less-Than-Significant Impact**. SB 743, which was signed into law by Governor Brown in 2013 and codified in Public Resources Code 21099, tasked the State Office of Planning and Research

(OPR) with establishing new criteria for determining the significance of transportation impacts under CEQA. SB 743 requires the new criteria to "promote the reduction of greenhouse gas emissions, the development of multmodal transportation networks, and a diversity of land uses." SB 743 changes the way that public agencies evaluate the transportation impacts of projects under CEQA, recognizing that roadway congestion, while an inconvenience to drivers, is not itself an environmental impact (see Pub. Resource Code, § 21099, subdivision (b)(2)).

SB 743 changed the CEQA Guidelines statewide beginning on July 1, 2020. The changes to CEQA guidelines will replace congestion-based metrics, such as auto delay and level of service, with Vehicle Miles Traveled (VMT) as the basis for determining significant impacts, unless the guidelines provide specific exceptions.

Page 12 of the OPR VMT Technical Advisory provides "screening thresholds" for the project description that indicate whether a project may have a significant impact. It states that "Screening thresholds such as project size, maps, transit availability, and provision of affordable housing, quickly identify when a project is expected to cause a less-than-significant impact without conducting a detailed study. Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact."

The operation and maintenance activities associated with the proposed project would not result in 110 trips per day, and, therefore, is assumed to result in a less-than-significant transportation impact. The proposed project would not conflict with or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)(2). This is a less-than-significant impact.

c) **Less-Than-Significant Impact**. The proposed project involves the construction and operation of new water facilities within existing easements and ROW. The proposed project would not substantially increase hazards due to a design feature (for example, sharp curves or dangerous intersections) or incompatible uses. Overall, the site plan shows adequate access to the site and operational issues associated with maintenance trips. No additional roads or design features are required. This is a less-than-significant impact.

d) **Less-Than-Significant Impact**. The proposed project would only require minimal maintenance trips. The MCWD would work with the local jurisdictions to assure that emergency vehicle and firefighter access are adequately addressed in the final project design. The impacts to emergency access would, therefore, be less than significant.

Conclusion: The proposed project would have a less-than-significant impact on transportation.

5.2.18 TRIBAL CULTURAL RESOURCES

Setting

California Assembly Bill (AB) 52, in effect since July 2015, provides CEQA protections for tribal cultural resources. All lead agencies approving projects under CEQA are required, if formally requested by a culturally affiliated California Native American Tribe, to consult with such tribe regarding the potential

impact of a project on tribal cultural resources before releasing an environmental document. Under California Public Resources Code §21074, tribal cultural resources include site features, places, cultural landscapes, sacred places, or objects that are of cultural value to a tribe and that are eligible for or listed on the California Register of Historical Resources (CRHR) or a local historic register, or that the lead agency has determined to be of significant tribal cultural value. At the time of preparation of this IS/MND, MCWD had yet to receive any requests for notification from tribes. The project sites are not located in the California Register nor are they included as a historic resource in a local historic register.

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
TRIBAL CULTURAL RESOURCES. Would the project:					
Cause a substantial adverse change in the significance of a tribal cultural resources, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:					1, 2, 3
a) Listed or eligible for listing in the California Register of Historic Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or (Source: 1, 2, 3)			X		1, 2, 3
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe. (Source: 1, 2, 3)		X			1, 2, 3

Explanation

a) **Less-Than-Significant Impact**. As indicated above in Section 5.2.5 Cultural Resources, the proposed project would not result in any adverse impacts to historical resources within the proposed project area, as the proposed project area does not contain any resources that are listed or eligible for listing in the CRHR, or in a local register of historical resources as defined in RPC Section 5020.1(k).

b) **Less-Than-Significant Impact with Mitigation**. No tribal cultural resources or Native American resources have been documented on the project sites. As discussed above in *Section 5.2.5 Cultural Resources*, ground disturbing activities on the site could impact unknown archeological resources including Native American artifacts and human remains. Potential impacts would be reduced to a less-than-significant level with implementation of **Mitigation Measures CR-1** and **CR-2**. In addition, pursuant Public Resources Code Section 21080.3.1, Native American Tribes are required to request notification by the District of potential projects. If consultation is requested, the District shall provide formal written notification to the California Native American tribe or tribes that are

traditionally and culturally affiliated with the project area. The tribe has 30 days of the notification to request consultation to determine if the project may have a significant effect on a tribal cultural resource. Since the District has not received a request for notification by any Native American tribes and the sacred lands search yielded a negative finding, this is considered a less-than-significant impact.

Mitigation Measure TRC-1: Implement Mitigation Measures CR-1 and CR-2.

Conclusion: The proposed project would have a less-than-significant impact on tribal cultural resources with implementation of the mitigation measure identified above.

5.2.19 UTILITIES AND SERVICE SYSTEMS

Setting

Utilities and services are furnished to the project site by the following providers:

- Wastewater Treatment: MCWD;
- Water Service: MCWD;
- Solid Waste: Monterey Regional Waste Management District; and
- Natural Gas & Electricity: 3CE and PG&E.

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
UTILITIES AND SERVICE SYSTEMS. Would the project:					
a) Require or result in the relocation or construction of new or expanded water, or wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? (Source: 1, 2)		X			1, 2, 3
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years? (Source: 1, 2)			X		1, 2, 3
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? (Source: 1, 2)			X		1, 2, 3
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? (Source: 1, 2)			X		1, 2, 3

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste? (Source: 1, 2)			X		1, 2, 3

Explanation

a) **Less-Than-Significant Impact with Mitigation**. The MCWD's 2020 Master Plan identifies several capital improvement projects needed in the immediate future, including the proposed project. The purpose of the proposed A1/A2 Reservoirs is to provide operational, fire, and emergency water storage for Zone A in the former Fort Ord community and Central Marina. Currently, Zone A in the former Fort Ord has no storage and is fed from Zone B through pressure reducing stations. Zone A in Central Marina has minimal gravity storage from the existing Intermediate Reservoir located in the former Fort Ord. Reservoir 2 in Central Marina sits below the hydraulic grade line (HGL) of Zone A, and, thus, requires a booster pump station to feed the distribution system.

The proposed project involves the construction and operation of the proposed reservoirs, B/C BPS, and associated infrastructure improvements at the Existing BPS site and Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building site. However, these facilities would involve the replacement and upgrade of the existing services and would not expand water, wastewater, storm water, or electric power usage beyond that which is already being used. The proposed project would not generate any natural gas or require telecommunication facilities. However, the proposed project does consist of the relocation of wastewater facilities, which may result in potentially significant impacts. Mitigation measures have been identified throughout this Initial Study to reduce any potential impacts resulting from the proposed project to a less-than-significant level.

b) **Less-Than-Significant Impact**. As stated above, the proposed project would not result in an increase in water demand. This represents a less-than-significant impact.

c) **Less-Than-Significant Impact**. The proposed project would not require additional wastewater treatment beyond that which is already being provided for the existing system. This represents a less-than-significant impact to wastewater systems.

d, e) **Less-Than-Significant Impact**. The proposed project would result in a less-than-significant impact in terms of solid waste generation. All construction-related debris would be hauled to the Monterey Regional Waste Management District facility north of the City. The proposed project would not generate additional waste beyond the level. The proposed project would comply with all federal, state, and local statutes and regulations related to solid waste.

Conclusion: The proposed project would have a less-than-significant impact on utilities and service systems.

5.2.20 WILDFIRE

Setting

The project sites are not located within or near a state responsibility area, as designated by Cal Fire (Cal Fire, Fire Hazard Severity Maps, 2007, 2008).

CEQA Thresholds

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
WILDFIRE. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:					
a) Substantially impair an adopted emergency response plan or emergency evacuation plan? (Source: 1, 2, 3, 13)			X		1, 2, 3, 14
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? (Source: 1, 2)				X	1, 2, 3, 14
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? (Source: 1, 2)				X	1, 2, 3, 14
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes? (Source: 1, 2, 3, 11)				X	1, 2, 3, 14

Explanation

a) **Less-Than-Significant Impact**. As stated above in Section 5.2.9 Hazards and Hazardous Materials, the proposed project would not create any barriers to emergency or other vehicle movement as it is not part of vehicular transportation network used by emergency vehicles. Final design would incorporate all Fire Code requirements. The proposed project would not substantially impair an adopted emergency response plan or emergency evacuation plan. This represents a less-than-significant impact.

b) **No Impact**. The proposed project would not exacerbate wildfire risks due to slope, prevailing winds, and other factors due to the proposed project's location away from natural areas that are highly susceptible to wildfire. The project sites are not located within an area of moderate, high, or very high Fire Hazard Severity for the Local Responsibility Area nor does it contain any areas of moderate, high, or very high Fire Hazard Severity for the state responsibility area.

c) **No Impact**. The proposed project would not require the installation or maintenance of associated fire suppression or related infrastructure.

d) **No Impact**. The proposed project would not expose people or structures to significant wildfire risks given its location away from natural areas that are susceptible to wildfire.

Conclusion: The proposed project would result in a less-than-significant impact related to wildfire.

5.2.21 MANDATORY FINDINGS OF SIGNIFICANCE

ENVIRONMENTAL IMPACTS	Potentially Significant Issues	Less-Than-Significant Impact with Mitigation	Less-Than-Significant Impact	No Impact	Checklist Source(s)
MANDATORY FINDINGS OF SIGNIFICANCE. Does the project:					
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? (Source: 1-13)		X			1-14
b) Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of the past projects, the effects of other current projects, and the effects of probable future projects. (Source: 1-13)		X			1-14
c) Have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly? (Source: 1-13)			X		1-14

Explanation

a) **Less-Than-Significant Impact with Mitigation**. Based on the analysis provided in this Initial Study, the proposed project would not have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory. Mitigation measures, standard permit conditions, and regulations are identified for potential impacts of the project on biological and cultural resources to reduce these effects to a less-than-significant level.

b) **Less-Than-Significant Impact with Mitigation**. Based on the analysis provided in this Initial Study, the proposed project would not significantly contribute to cumulative impacts. The potential impacts identified throughout the document would be minimized by implementation of standard permit conditions and mitigation, and would not significantly contribute to cumulative impacts in the area.

c) **Less-Than-Significant Impact**. Based on the analysis provided in this Initial Study, the proposed project would not result in environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly.

Conclusion: The proposed project would have a less-than-significant impact on the environment with the incorporation of mitigation measures and standard permit conditions identified in this document.

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6. DOCUMENT PREPARATION & REFERENCES

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Michael Wegley, P.E., District Engineer

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Appendix A

MCWD A1/A2 RESERVOIRS & B/C ZONES BPS PROJECT BIOLOGICAL RESOURCES REPORT

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MARINA COAST WATER DISTRICT
A1/A2 RESERVOIRS &
B/C ZONES BOOSTER PUMP STATION PROJECT
BIOLOGICAL RESOURCES REPORT

January 2021

Prepared for

Marina Coast Water District

Prepared by

Denise Duffy & Associates, Inc.
947 Cass Street, Suite 5
Monterey, California 93940

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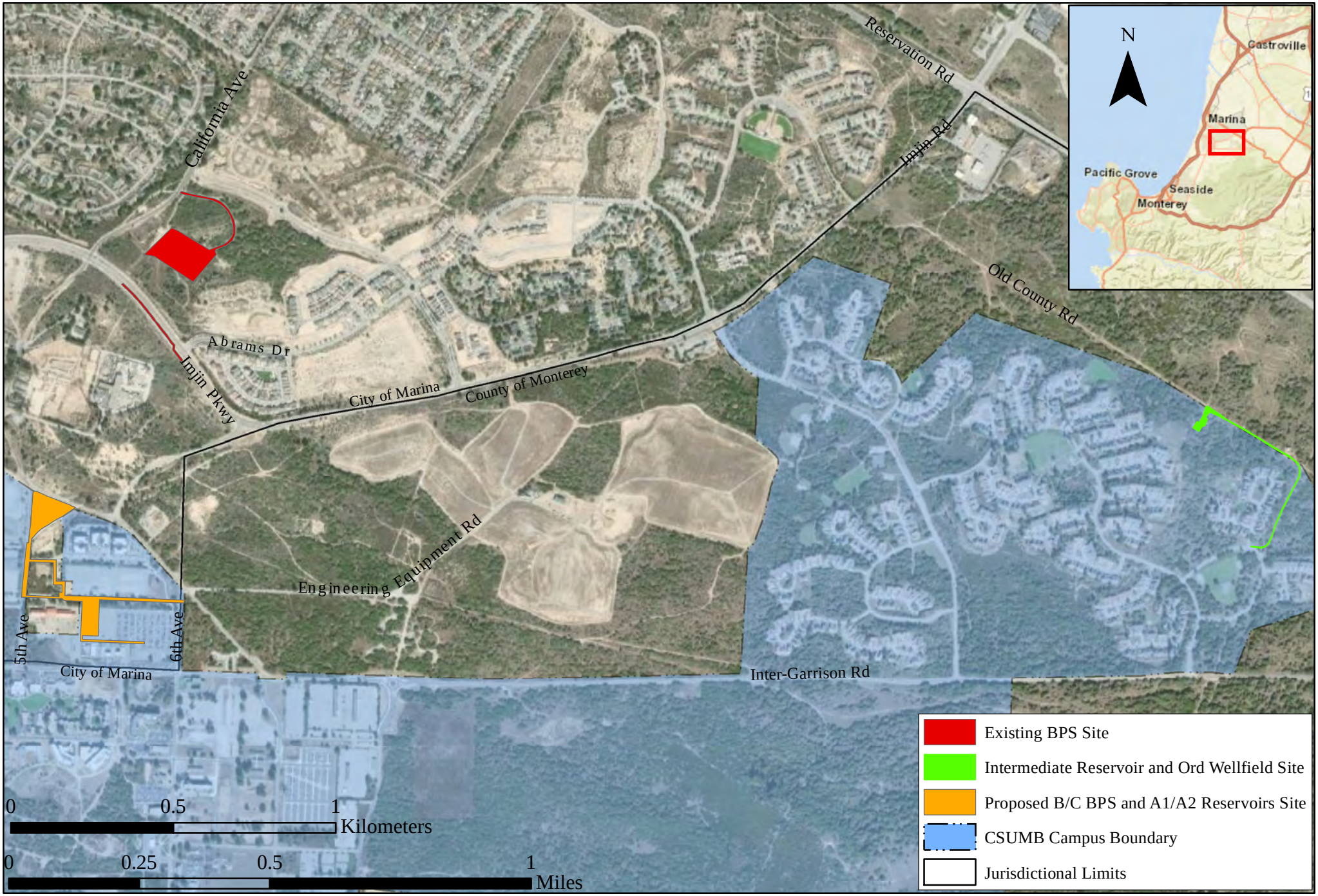
Figures

Tables

1.0 INTRODUCTION

Denise Duffy & Associates, Inc. (DD&A) was contracted by the Marina Coast Water District (MCWD or District) to prepare a Biological Resources Report for the A1/A2 Reservoirs and B/C Zones Booster Pump Station Project (proposed project), located at three distinct project locations within the City of Marina (City) in Monterey County, California (**Figure 1**). Portions of the proposed project are also located within the California State University Monterey Bay (CSUMB) campus. The proposed project involves the relocation and replacement of the existing B/C Zones Booster Pump Station (B/C BPS) and Sand Tank (**Figure 1**) with a new B/C BPS and A1/A2 Reservoirs (reservoirs) (**Figure 1**). In addition, the proposed project includes various associated infrastructure improvements at the Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building (**Figure 1**).

This report describes the existing biological resources within and adjacent to the project sites, including any special-status species or sensitive habitats known or with the potential to occur within and adjacent to the project sites. This report also assesses the potential impacts to biological resources that may result from construction activities and permanent development of project components, and recommends appropriate avoidance, minimization, and mitigation measures necessary to reduce those impacts to a less-than-significant level in accordance with the California Environmental Quality Act (CEQA).



Location Map

Date: 12/15/2020

Scale: 1 inch = 1,000 feet

Project: 2019-20

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Figure 1

1.1 PROJECT LOCATION

The proposed project is located at three distinct project locations within the City limits on the former Fort Ord in Monterey County, California. These locations are as follows:

- The Existing BPS and Sand Tank is located northeast of the intersection of California Avenue and Imjin Parkway (assessor's parcel number [APN] 031-271-016-000) within the City, on a 3.79-acre easement in the Sea Haven (formerly Marina Heights) Specific Plan area (**Figure 2**). A portion of this project site is also located within the Imjin Parkway right-of-way.
- The two proposed A1/A2 Reservoirs (reservoirs) and B/C Zone Booster Pump Station (B/C BPS) would be located within a 1.6-acre easement on the CSUMB campus (**Figure 3**). The project site is situated on an existing paved parking lot on APN 031-101-033-000 near 8th Street and 6th Avenue, east of the City's Public Works Corporation Yard. There is an additional 0.59-acre pipeline easement at this location, which connects the north end of the facility easement to 6th Avenue.
- The existing Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building are co-located on a 0.63-acre easement along Old County Road (**Figure 4**).[1] The 24-inch wellfield pipeline is located within a 15-foot-wide portion of the easement owned by the MCWD, and extends from the building, southeast along Old Country Road, before turning south on (an unnamed) dirt road that extends to Wainwright Drive.

[1] The Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building site is located within the unincorporated County, with the wellfield pipeline on University of California property and tank and fenced yard on CSUMB property. However, the site is within the City's Sphere of Influence and, therefore, considered within the City's jurisdiction.

Existing BPS Site Map

Date: 12/15/2020

Scale: 1 inch = 300 feet

Project: 2019-20

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Figure 2

Proposed B/C BPS and A1/2 Reservoirs Site Map

Date: 12/15/2020
Scale: 1 inch = 300 feet
Project: 2019-20

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Figure 3

Intermediate Reservoir and Ord Wellfield Site Map

Date: 12/15/2020

Scale: 1 inch = 200 feet

Project: 2019-20

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Figure 4

1.2 PROJECT DESCRIPTION

As part of the MCWD's 2006 Marina Water System Master Plan (2006 Master Plan) and 2020 Water Master Plan (2020 Master Plan), the proposed project involves the relocation and replacement of the existing B/C BPS and Sand Tank with a new B/C BPS and two new A1/A2 Reservoirs. The purpose of the proposed A1/A2 Reservoirs is to provide operational, fire, and emergency water storage for Zone A in Ord Community and Central Marina service areas. In addition, the proposed project involves various associated infrastructure improvements at the Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building. The proposed project would include two new potable water storage tanks (reservoirs) and a new B/C BPS to pump water from the new storage tanks to the existing B and C pressure zone reservoirs and distribution system. A portion of the C-Zone transmission main from the existing BPS would be converted to an A-Zone transmission main to supply the new reservoirs. This would require adding a new pipeline in Imjin Parkway and adjusting valves at the existing pump station to connect the wellfield transmission mains to the C-Zone transmission main.

The project also proposes various improvements at the existing Intermediate Reservoir, F Booster Pump Station, and Ord Wellfield Chlorination Building. The project proposes to update the Supervisory Control and Data Acquisition (SCADA) system, replace the altitude valve, replace the emergency generator, and recoat the Intermediate Reservoir. Improvements to the Ord Community wellfield disinfection system at the Chlorination Building include adding a flow meter on the wellfield main and variable speed drives on the dosing pumps. The location of the new flow meter was selected to avoid mapped occurrences of Monterey spineflower.

The existing B/C BPS is centrally located within the MCWD's wellfield on the former Fort Ord and multiple pipelines radiate out from the B/C BPS site. The two 16-inch pipelines that connect the wellfield to the BPS converge at the Bermad valve, which is located outside the BPS easement. These wellfield pipelines are planned to be replaced in the future with a 24-inch pipeline located within California Avenue and Imjin Parkway. After the proposed project is completed, the existing B/C BPS and Sand Tank may be demolished, and the easement quitclaimed back to the City of Marina. However, any future demolition and/or decommissioning activities are not included as part of the proposed project since the timing and project-specific activities are unknown at this time. The proposed project only consists of the replacement of the pipeline within the existing roadway.

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2.0 METHODS

2.1 PERSONNEL AND SURVEY METHODS

DD&A biologists Matt Johnson, Patric Krabacher, and Max Hofmarcher conducted biological surveys of the project sites on April 18, May 9, and May 13, 2019. The study area for each site included all areas that could potentially be disturbed during project construction, including the proposed limits of work, access routes, and staging areas (**Figures 2-4**), with the exception of a small portion of the dirt road (Old Country Road) just west of the gravel driveway accessing the Intermediate Reservoir and Ord Wellfield study area since no project components were proposed at the time of the survey effort. Botanical survey methods included walking the survey area and using aerial maps and GPS to identify general vegetation types and potential sensitive vegetation types and conducting focused surveys for special-status plant species. Reconnaissance-level wildlife habitat surveys were conducted concurrently with botanical surveys to identify presence of any special-status wildlife species or suitable habitat for those species.

The study areas were surveyed for botanical resources following the applicable guidelines outlined in the U.S. Fish and Wildlife Service's (Service) *Guidelines for Conducting and Reporting Botanical Inventories for Federally listed, Proposed and Candidate Plants* (Service, 2000), the California Department of Fish and Wildlife's (CDFW) *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW, 2018), and the California Native Plant Society's (CNPS) *Botanical Survey Guidelines* (CNPS, 2001). Most special-status plant species identified were mapped using a Trimble® Geo 7x Series global positioning system (GPS) with an external Zephyr Model 2 antenna.

Populations of plants with more than five individuals were mapped as a polygon and the density of the population was documented. Densities were recorded as low (1-33% cover), medium (34-66% cover), and high (67-100% cover). Individual plants or populations of five or fewer individuals were mapped as a point and a count of the number of individual plants was documented. Populations included all individuals within approximately three feet of another individual; individual plants further than three feet apart were mapped as a separate polygon or point. In addition, some special-status species populations, specifically, large perennial shrubs, were mapped by hand drawing on aerial images in the field, which were later digitized, as their populations covered significant portions of the survey areas. Shapefiles were then imported into the Geographical Information System (GIS) ESRI® ArcGIS 10.6 software platform and overlaid on high-resolution aerial photography/satellite imagery. Vegetation types were also mapped during the surveys by hand drawing on aerial maps and later digitizing using ArcGIS software.

As identified above, one portion of the Intermediate Reservoir and Ord Wellfield study area was not surveyed for botanical resources (**Figure 4)**; however, aerial maps and professional knowledge of the area were utilized to determine habitat types present and potential habitat for special-status plant and wildlife species.

2.2 SENSITIVE HABITATS

Sensitive habitats include riparian corridors, wetlands, habitats for legally protected species, areas of high biological diversity, areas supporting rare or special-status wildlife habitat, and unusual or regionally restricted vegetation types. Vegetation communities considered sensitive include those listed on CDFW's *California Natural Communities List* (i.e., those habitats that are rare or endangered within the borders of California) (CDFW, 2020), those that are occupied by species listed under the federal Endangered Species

Act (ESA) or are critical habitat in accordance with ESA, and those that are defined as an Environmentally Sensitive Habitat Area (ESHA) under the California Coastal Act (CCA). Specific habitats may also be identified as sensitive in city or county general plans or ordinances. Sensitive habitats are regulated under federal regulations (such as the Clean Water Act [CWA] and Executive Order [EO] 11990 – Protection of Wetlands), state regulations (such as CEQA and the CDFW Streambed Alteration Program), or local ordinances or policies (such as city or county tree ordinances and general plan policies).

2.3 SPECIAL-STATUS SPECIES

Special-status species are those plants and animals that have been formally listed or proposed for listing as endangered or threatened or are candidates for such listing under ESA or the California Endangered Species Act (CESA). Listed species are afforded legal protection under the ESA and CESA. Species that meet the definition of rare or endangered under the CEQA Guidelines Section 15380 are also considered special-status species. Animals on the CDFW's list of "species of special concern" (most of which are species whose breeding populations in California may face extirpation if current population trends continue) meet this definition and are typically provided management consideration through the CEQA process, although they are not legally protected under the ESA or CESA. CDFW also includes some animal species that are not assigned any of the other status designations in the California Natural Diversity Database (CNDDB) "Special Animals" list; however, these species have no legal or protection status and are not analyzed in this document.

Plants listed as rare under the California Native Plant Protection Act (CNPPA) or included in CNPS California Rare Plant Ranks (CRPR; formerly known as CNPS Lists) 1A, 1B, 2A, and 2B are also treated as special-status species as they meet the definitions of Sections 2062 and 2067 of the CESA and in accordance with CEQA Guidelines Section 15380.[2] In general, the CDFW requires that plant species on CRPR 1A (Plants presumed extirpated in California and Either Rare or Extinct Elsewhere), CRPR 1B (Plants rare, threatened, or endangered in California and elsewhere), CRPR 2A (Plants presumed extirpated in California, but more common elsewhere); and CRPR 2B (Plants rare, threatened, or endangered in California, but more common elsewhere) of the CNPS *Inventory of Rare and Endangered Vascular Plants of California* (CNPS, 2019) be fully considered during the preparation of environmental documents relating to CEQA.[3] CNPS CRPR 4 species (plants of limited distribution) may, but generally do not, meet the definitions of Sections 2062 and 2067 of CESA, and are not typically considered in environmental documents relating to CEQA. While other species (i.e., CRPR 3 or 4 species) are sometimes found in database searches or within the literature, these do not meet the definitions of Section 2062 and 2067 of CESA and are not analyzed in this document.

Raptors (e.g., eagles, hawks, and owls) and their nests are protected in California under Fish and Game Code Section 3503.5. Section 3503.5 states that it is "unlawful to take, possess, or destroy the nest or eggs of any such bird except otherwise provided by this code or any regulation adopted pursuant thereto." In addition, fully protected species under the Fish and Game Code Section 3511 (birds), Section 4700 (mammals), Section 5515 (fish), and Section 5050 (reptiles and amphibians) are also considered special-status animal species. Species with no formal special-status designation but thought by experts to be rare

[2] CNPS initially created five CRPR to categorize degrees of concern; however, to better define and categorize rarity in California's flora, the CNPS Rare Plant Program and Rare Plant Program Committee have developed the new CRPR 2A and CRPR 2B.

[3] CRPR 3 species (Plants about which we need more information - a review list) and CRPR 4 species (Plants of limited distribution - a watch list) may, but generally do not, meet the definitions of Sections 2062 and 2067 of CESA, and are not typically considered in environmental documents relating to CEQA.

or in serious decline may also be considered special-status animal species in some cases, depending on project-specific analysis and relevant, localized conservation needs or precedence.

2.4 DATA SOURCES

The primary literature and data sources reviewed to determine the presence or potential presence of special-status species at the project sites include:

- Current agency status information from the Service and CDFW for species listed, proposed for listing, or candidates for listing as threatened or endangered under ESA or CESA, and those considered CDFW "species of special concern", including:
  - CNDDB occurrences reports from the Marina quadrangle and the six surrounding quadrangles, including Monterey, Moss Landing, Prunedale, Salinas, Seaside, and Spreckels (**Appendix C** CDFW, 2019); and
  - The Service's Information for Planning and Consultation (IPaC) Resource List (**Appendix D**; Service, 2019).
- The CNPS *Inventory of Rare and Endangered Vascular Plants of California* (CNPS, 2020);
- The *Flora and Fauna Baseline Study of Fort Ord* (Baseline Study; U.S. Army Corps of Engineers [ACOE], 1992); and
- The *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord* (HMP) (ACOE, 1997).

From these resources, a list of special-status plant and wildlife species known or with the potential to occur in the vicinity of the study areas was created (**Appendix A**). This list presents these species along with their legal status, habitat requirements, and a brief statement of the likelihood to occur.

2.4.1 Botany

Vegetation types identified in *A Manual of California Vegetation* (Sawyer et.al., 2009) were utilized to determine if vegetation types identified as sensitive on CDFW's California Natural Communities List (CDFW, 2020) are present within the study areas. Information regarding the distribution and habitats of local and state vascular plants was also reviewed (Howitt and Howell, 1964 and 1973; Munz and Keck, 1973; Baldwin et al., 2012; Matthews and Mitchell, 2015; Jepson Flora Project, 2019). All plants observed within the study areas were identified to species or intraspecific taxon necessary to eliminate them as being special-status species using keys and descriptions in *The Jepson Manual: Vascular Plants of California, Edition 2* (Baldwin et al., 2012) and *The Plants of Monterey County an Illustrated Field Key* (Matthews and Mitchell, 2015). Scientific nomenclature for plant species identified within this document follows Baldwin, et. al, (2012); common names follow Matthews and Mitchell (2015). A full botanical inventory was recorded for the study areas and the dominant species within each habitat were noted. Dominant plant species are those which are more numerous than its competitors in an ecological community or makes up more of the biomass; generally, the species that are most abundant. Most ecological communities are defined by their dominant species.

The California Invasive Plant Council (Cal-IPC) Inventory (Cal-IPC, 2020) was reviewed to determine if any invasive plant species are present within the study areas.

2.4.2 Wildlife

The following literature and data sources were reviewed: CDFW reports on special-status wildlife (Remsen, 1978; Williams, 1986; Jennings and Hayes, 1994; Thelander, 1994; Thomson et. al, 2016); California Wildlife Habitat Relationships Program species-habitat models (Zeiner et al., 1988 and 1990); and general wildlife references (Stebbins, 1972, 1985, and 2003).

2.5 REGULATORY SETTING

The following regulatory discussion describes the major regulations that may be applicable to the project.

2.5.1 Federal Regulations

Federal Endangered Species Act

Provisions of the ESA of 1973 (16 USC 1532 et seq., as amended) protect federally listed threatened or endangered species and their habitats from unlawful take. Listed species include those for which proposed and final rules have been published in the Federal Register. The ESA is administered by the Service or National Oceanic and Atmospheric Administration Marine Fisheries Service (NMFS). In general, the NMFS is responsible for the protection of ESA-listed marine species and anadromous fish, whereas other listed species are under Service jurisdiction.

The U.S. Army's decision to close and dispose of the Fort Ord military base was considered a major federal action that could affect listed species under the ESA. The Service issued a Final Biological Opinion (BO) on the disposal and reuse of former Fort Ord on October 19, 1993. The Service issued five additional BOs and one amendment between 1999 and 2014 as a result of consultation reinitiated by the Army. On May 28, 2015, the Service issued a Programmatic BO that superseded the previous BOs. Then on June 7, 2017, the Service issued a reinitiated Programmatic BO that supersedes the 2015 Programmatic BO. The 2017 Programmatic BO is the current and relevant BO for activities at the former Fort Ord; the 2017 Programmatic BO contains additional conservation measures and recommendations relating to environmental cleanup actions at former Fort Ord cleanup sites.

Section 9 of ESA prohibits the take of any fish or wildlife species listed under ESA as endangered or threatened. Take, as defined by ESA, is "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Harm is defined as "any act that kills or injures the fish or wildlife…including significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife." In addition, Section 9 prohibits removing, digging up, and maliciously damaging or destroying federally listed plants on sites under federal jurisdiction. Section 9 does not prohibit take of federally listed plants on sites not under federal jurisdiction. If there is the potential for incidental take of a federally listed fish or wildlife species, take of listed species can be authorized through either the Section 7 consultation process for federal actions or a Section 10 incidental take permit process for non-federal actions. Federal agency actions include activities that are on federal land, conducted by a federal agency, funded by a federal agency, or authorized by a federal agency (including issuance of federal permits).

Executive Order 13112 - Invasive Species

EO 13112 - Invasive Species requires the prevention of introduction and spread of invasive species. Invasive species are defined as "alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health." Each federal agency whose actions may affect the status

of invasive species on a project site shall, to the extent practicable and permitted by law, subject to the availability of appropriations, use relevant programs and authorities to: 1) prevent the introduction of invasive species; 2) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; 3) monitor invasive species populations accurately and reliably; 4) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; 5) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and 6) promote public education on invasive species and the means to address them. A national invasive species management plan was prepared by the National Invasive Species Council and the Invasive Species Advisory Committee (ISAC) that recommends objectives and measures to implement the EO.

2.5.2 State Regulations

California Endangered Species Act

The CESA was enacted in 1984. The California Code of Regulations (Title 14, §670.5) lists animal species considered endangered or threatened by the state. Section 2090 of CESA requires state agencies to comply with endangered species protection and recovery and to promote conservation of these species. Section 2080 of the Fish and Game Code prohibits "take" of any species that the commission determines to be an endangered species or a threatened species. "Take" is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." A Section 2081 Incidental Take Permit from the CDFW may be obtained to authorize "take" of any state listed species.

California Native Plant Protection Act

The CNPPA of 1977 directed CDFW to carry out the legislature's intent to "preserve, protect and enhance rare and endangered plants in the State." The CNPPA prohibits importing rare and endangered plants into California, taking rare and endangered plants, and selling rare and endangered plants. The CESA and CNPPA authorized the Fish and Game Commission to designate endangered, threatened, and rare species and to regulate the taking of these species (§2050-2098, Fish and Game Code). Plants listed as rare under the CNPPA are not protected under CESA; however, these plants may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research.

California Fish and Game Code

Birds. Section 3503 of the Fish and Game Code (FGC) states that it is "unlawful to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Section 3503.5 prohibits the killing, possession, or destruction of any birds in the orders Falconiformes or Strigiformes (birds-of-prey). Section 3511 prohibits take or possession of fully protected birds. Section 3513 prohibits the take or possession of any migratory nongame birds designated under the federal MBTA. Section 3800 prohibits take of nongame birds.

Fully Protected Species. The classification of fully protected was the state's initial effort in the 1960s to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish (§5515), mammals (§4700), amphibians and reptiles (§5050), and birds (§3511). Most fully protected species have also been listed as threatened or endangered species under the more recent endangered species laws and regulations. Fully protected species may not be taken or possessed at any

time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.

Species of Special Concern. As noted above, the CDFW also maintains a list of wildlife "species of special concern." Although these species have no legal status, the CDFW recommends considering these species during analysis of project impacts to protect declining populations and avoid the need to list them as endangered in the future.

CSUMB Tree Restoration Program

CSUMB has established a tree restoration program for impacts to coast live oak and other trees resulting from projects that occur on campus. This program requires that for every removed tree that is four inches or greater in diameter breast height (dbh), two coast live oak trees would be replanted, and assumed to survive, in the identified restoration area on campus. In some cases, more than two trees would need to be planted to achieve this survival rate. The implementation of this program is required for all projects that would result in impacts to trees of four inches in dbh or greater.

2.5.3 Local Regulations

Fort Ord Habitat Management Plan

The U.S. Army's decision to close and dispose of the Fort Ord military base was considered a major federal action that could affect listed species under the ESA. In 1993, the Service issued a BO on the disposal and reuse of former Fort Ord requiring that a HMP be developed and implemented to reduce the incidental take of listed species and loss of habitat that supports these species (Service, 1993, updated to Service, 2017). The HMP was prepared to assess impacts on vegetation and wildlife resources and provide mitigation for their loss associated with the disposal and reuse of former Fort Ord (ACOE, 1997).

The HMP establishes guidelines for the conservation and management of species and habitats on former Fort Ord lands by identifying lands that are available for development, lands that have some restrictions with development, and habitat reserve areas. The intent of the plan is to establish large, contiguous habitat conservation areas and corridors to compensate for future development in other areas of the former base. The HMP identifies what type of activities can occur on each parcel at former Fort Ord; parcels are designated as "development with no restrictions," "habitat reserves with management requirements," "habitat corridors," or "habitat reserves with development restrictions." The HMP sets the standards to assure the long-term viability of the former Fort Ord's biological resources in the context of base reuse so that no further mitigation should be necessary for impacts to species and habitats considered in the HMP. This plan has been approved by USFWS; the HMP, deed restrictions, and Memoranda of Agreement between the Army and various land recipients provide the legal mechanism to assure HMP implementation. It is a legally binding document, and all recipients of former Fort Ord lands are required to abide by its management requirements and procedures.

The HMP anticipates some losses to special-status species and sensitive habitats as a result of redevelopment of the former Fort Ord. With the designated reserves and corridors and habitat management requirements in place, the losses of individuals of species and sensitive habitats considered in the HMP are not expected to jeopardize the long-term viability of those species, their populations, or sensitive habitats on former Fort Ord. Recipients of disposed land with restrictions or management guidelines designated by the HMP will be obligated to implement those specific measures through the HMP and through deed covenants.

However, the HMP does not provide specific authorization for incidental take of federal or state listed species to existing or future non-federal land recipients under the ESA or CESA. As such, impacts to federal and state listed species require acquisition of a Section 7 or 10 ITP from the Service and/or a Section 2081 ITP from CDFW.

The project sites are located within designated "development" parcels. Parcels designated as "development" have no management restrictions. However, the 2017 Programmatic BO and HMP require the identification of sensitive botanical resources within the development parcels that may be salvaged for use in restoration activities in reserve areas (Service, 2017 and ACOE, 1997). In addition, the HMP requires that land recipients prepare and implement Resource Management Plans (RMP) and Borderland Management Plans (BMP) for specified parcels within their respective jurisdictions.

City of Marina Municipal Code Chapter 12.04

The City of Marina Municipal Code Chapter 17.51 (Tree Removal, Preservation, and Protection) outlines the policies regarding tree removal and relocation. The policies applicable to this project include Section 17.51.030 (Unlawful Action upon Trees) and Section 17.51.060 (Tree Removal Permit). As outlined in Section 12.04.060 (D), if it is determined by the City that adverse effects of tree removal can be mitigated, conditions shall be imposed on the removal, including, but not limited to, one or more of the following: 1) Tree Removal and Protection Plan; 2) Compensation Plans; and 3) Site Restoration Plan.

Habitat Conservation Plans or NCCP

There are no adopted HCPs or Natural Community Conservation Plans (NCCP) associated with the project sites.

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3.0 RESULTS

3.1 VEGETATION COMMUNITIES

Vegetation communities mapped within the study areas include ruderal/disturbed, maritime chaparral, coast live oak woodland, and coastal scrub. In addition, some of the project area is developed (**Figures 5-7**). **Table 1** provides the acreages of these vegetation types within the study area associated with each project site. A brief description of each vegetation type can be found below. In addition, each vegetation type description identifies the vegetation classification from *A Manual of California Vegetation* (Sawyer et al., 2009) and whether the vegetation type is identified as sensitive on CDFW's *California Natural Communities List* (CDFW, 2019b).

Table 1. Vegetation Types within the Study Areas

Vegetation Type	**Acres**			
	Existing BPS Study Area	*Proposed B/C BPS Study Area*	*Intermediate Reservoir and Ord Wellfield Study Area*	*Total*
Ruderal/Disturbed	3.59	3.65	0.7	7.94
Maritime Chaparral	0.03	0	0	0.03
Coast Live Oak Woodland	0.07	0	0.01	0.08
Coastal Scrub	0.01	0.25	0.01	0.27
Developed	1.78	2.82	0.23	4.83
Total	***5.48***	***6.72***	***0.95***	***13.15***

3.1.1 Maritime Chaparral

- *A Manual of California Vegetation* classifications: Sandmat manzanita chaparral shrubland alliance and brittle leaf - wooly leaf manzanita chaparral (*Arctostaphylos [crustacea, tomentosa*]) shrubland alliance
- CDFW's *California Natural Communities List*: *Sensitive*

A very small area of maritime chaparral is present within the Existing BPS study area (**Figure 5**). The Baseline Study identifies two weakly differentiated types of maritime chaparral occurring on the former Fort Ord: sand hill maritime chaparral and Aromas Formation maritime chaparral (ACOE, 1992). The Baseline Study identifies that sand hill maritime chaparral occurs on Pleistocene sand deposits in the more coastal areas of the former Fort Ord, including the Existing BPS study area. Maritime chaparral within the study area is dominated by sandmat manzanita, wooly leaf manzanita (*A. tomentosa*), chamise (*Adenostoma fasciculatum*), coyote brush (*Baccharis pilularis*), and mock heather (*Ericameria ericoides*). Additional species within this vegetation type include California coffeeberry (*Frangula californica*), poison oak (*Toxicodendron diversilobum*), and black sage (*Salvia mellifera*). No maritime chaparral is located within the Proposed B/C BPS study area or the Intermediate Reservoir and Ord Wellfield study area.

Existing BPS Site Vegetation Communities

Date: 12/15/2020
Scale: 1 inch = 300 feet
Project: 2019-20

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Figure 5

Proposed B/C BPS and A1/A2 Reservoirs Site Vegetation Communities

Date: 12/15/2020

Scale: 1 inch = 300 feet

Project: 2019-20

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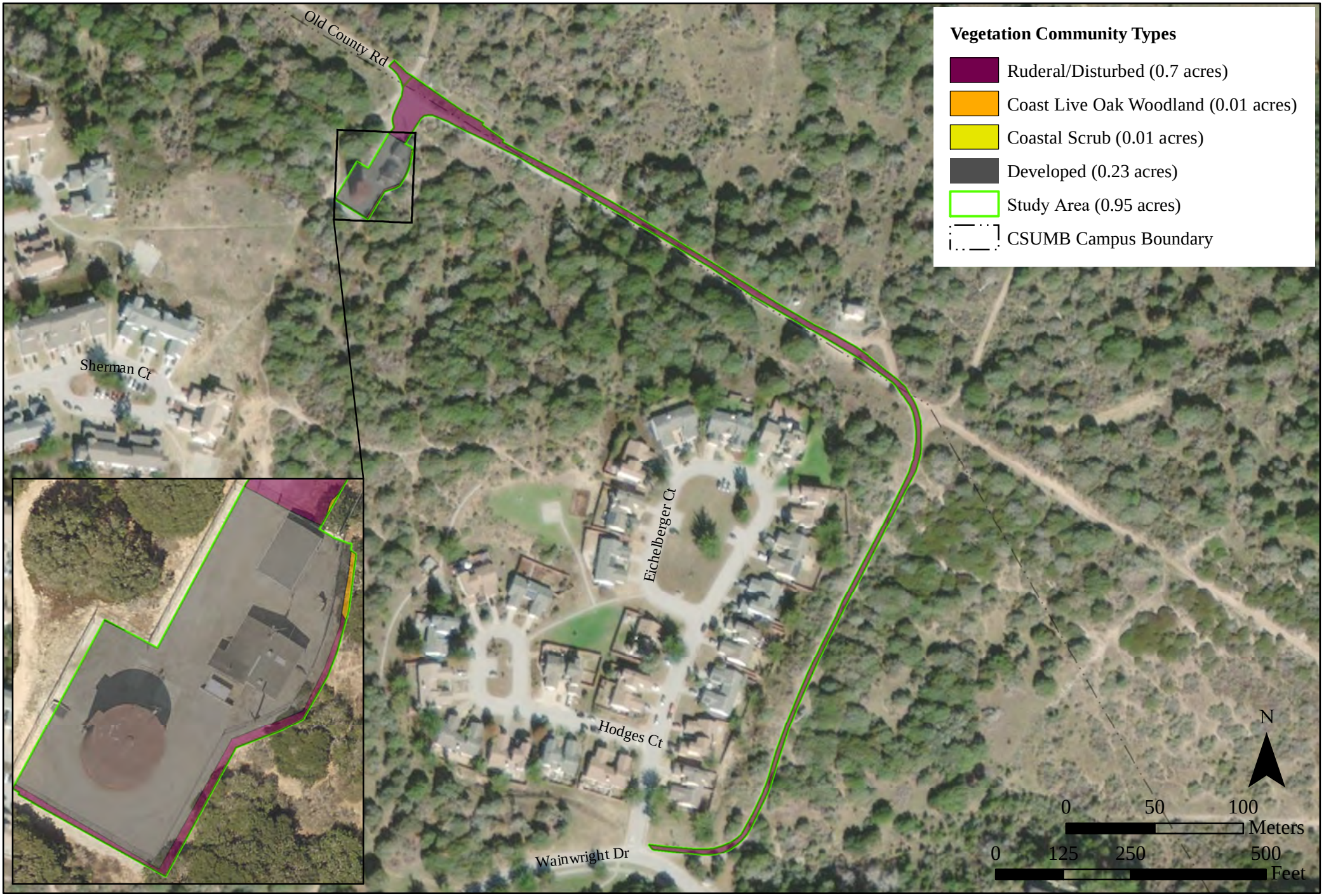
Figure 6



Intermediate Reservoir and Ord Wellfield Site Vegetation Communities

Date: 12/15/2020
Scale: 1 inch = 200 feet
Project: 2019-20

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Figure 7

Common wildlife species that occur within maritime chaparral include California quail (*Callipepla californica*), California towhee (*Melozone crissalis*), California thrasher (*Toxostoma redivivum*), common poorwill (*Phalaenoptilus nuttallii*), Anna's hummingbird (*Calypte anna*), wrentit (*Chamaea fasciata*), western scrub jay (*Aphelocoma californica*), northern pacific rattlesnake (*Crotalus oreganus ssp. oreganus*), Coast Range fence lizard (*Sceloporus occidentalis bocourtii*), gopher snake (*Pituophis catenifer catenifer*), coast garter snake (*Thamnophis elegans terrestris*), and brush rabbit (*Sylvilagus bachmani*).

3.1.2 Coast Live Oak Woodland

- *A Manual of California Vegetation* classification: Coast live oak woodland (*Quercus agrifolia* association)
- CDFW's *California Natural Communities List:* Not sensitive

Very small areas of coast live oak woodland are present within the Existing BPS study area and the Intermediate Reservoir and Ord Wellfield study area (**Figures 4** and **7**; **Table 1**). The canopy is quite dense in many areas with a sparsely vegetated understory and thick leaf litter. In some areas, poison oak, hottentot fig (iceplant) (*Carpobrotus* sp.), and black sage are present beneath the oak trees, but are not dominant. No coast live oak woodland is located within the Proposed B/C BPS study area.

Coast live oak woodland is important habitat to many wildlife species. Oaks provide nesting sites for many avian species and cover for a variety of mammals, including mourning dove (*Zenaida macroura*), American kestrel (*Falco sparverius*), California ground squirrel (*Otospermophilus beecheyi*), and California pocket mouse (*Chaetodipus californicus*). Acorns provide an important food source for acorn woodpecker (*Melanerpes formicivorus*), western scrub jay, and black-tailed deer (*Odocoileus hemionus columbianus*). Other common wildlife species found in the coast live oak woodland are raccoon (*Procyon lotor*), Nuttall's woodpecker (*Picoides nuttallii*), northern flicker (*Colaptes auratus*), bobcat (*Lynx rufus*), and coyote (*Canis latrans*). Generally, red-tailed hawks (*Buteo jamaicensis*) and great-horned owls (*Bubo virginianus*) nest and roost in the coast live oaks.

3.1.3 Coastal Scrub

- *A Manual of California Vegetation classifications*: Coyote brush scrub (Baccharis pilularis shrubland alliance) and black sage scrub (Salvia mellifera shrubland alliance)
- CDFW's *California Natural Communities List*: Not sensitive

Coastal scrub is present within all of the study areas at each site (**Table 1**). The Baseline Study describes coastal scrub on the former Fort Ord as "characterized by sparse to dense cover of soft-leaved low-stature shrubs on sandy or rocky soils" and notes that this vegetation type intergrades with grassland, maritime chaparral, coast live oak woodland, and dune scrub (ACOE, 1992). The dominant shrub species in the coastal scrub include black sage, coyote brush, poison oak, mock heather, sticky monkey flower (*Diplacus aurantiacus*), and coast sagebrush (*Artemisia californica*).

Coastal scrub communities provide cover and food for a number of wildlife species, including songbirds, snakes, lizards, rodents, and other small mammals. Common species that may occur within central coastal scrub include California quail, blue-gray gnatcatcher (*Polioptila caerulea*), Anna's hummingbird, Coast Range fence lizard, northern pacific rattlesnake, gopher snake, brush rabbit, and California ground squirrel.

3.1.4 Ruderal/Disturbed

The majority of the study areas can be classified as ruderal, which includes active dirt roads or areas that have been disturbed by human activities. These areas are dominated by non-native annual grasses and other "weedy" species, including hottentot fig, silvery hairgrass (*Aira caryophyllea*), slender wild oat (*Avena barbata*), Italian thistle (*Carduus pycnocephalus*), filaree (*Erodium* sp.), bur clover (*Medicago* sp.), and sheep sorrel (*Rumex acetosella*). Ruderal areas have low biological value because they are generally dominated by non-native plant species, consist of relatively low-quality habitat from a wildlife perspective, or are consistently disturbed by vehicle or foot traffic. However, common wildlife species which do well in urbanized and disturbed areas, such as the American crow (*Corvus brachyrhynchos*), California ground squirrel, raccoon, striped skunk (*Mephitis mephitis*), western scrub jay, European starling (*Sturnus vulgaris*), Coast Range fence lizard, and rock pigeon (*Columba livia*), may forage within this vegetation type.

3.1.5 Developed

- *A Manual of California Vegetation* classifications: None
- CDFW's *California Natural Communities List*: N/A

Developed areas within the study areas include paved roads, sidewalks, permanent buildings, and parking lots. Little to no vegetation is present within developed areas and they are considered to have little biological value. No special-status species were observed within developed areas during 2019 biological surveys of the study areas, and none are expected to occur due to lack of suitable habitat.

3.2 SENSITIVE HABITATS

The study areas were evaluated for the presence of sensitive habitats. One sensitive habitat, maritime chaparral, was identified within the Existing BPS study area (0.03 acres). Maritime chaparral habitat is identified as a sensitive habitat on the CDFW's *California Natural Communities List* (Sandmat manzanita chaparral [*Arctostaphylos pumila* provisional shrubland alliance]; CDFW, 2020) and in the HMP (ACOE, 1997).

3.3 SPECIAL-STATUS SPECIES

Published occurrence data within the study areas and surrounding USGS quadrangles were evaluated to compile a table of special-status species known to occur in the vicinity of the study area (see "Methods" and **Appendix A**). Each of these species was evaluated for their likelihood to occur within and immediately adjacent to the study areas. The special-status species that are known to or have been determined to have a moderate or high potential to occur within or immediately adjacent the study areas are identified in **Tables 2**, **4**, and **5**, and discussed below. All other species are assumed unlikely to occur or have a low potential to occur based on the species-specific reasons presented in **Appendix A**, and, therefore, unlikely to be impacted by the proposed project and are not discussed further.

3.3.1 Special-Status Wildlife

Table 2 identifies the potential for special-status wildlife species to occur within each of the study areas. A discussion of each species is provided below.

Table 2. Potential for Special-Status Wildlife Species Occurrence within the Study Areas

Species	Proposed B/C BPS Study Area	Existing BPS Study Area	Intermediate Reservoir and Ord Wellfield Study Area
Monterey dusky-footed woodrat	Low	High	High
Monterey ornate shrew	Low	Moderate	High
California tiger salamander	Unlikely	Unlikely	Moderate
Northern California legless lizard	High	High	High
Coast horned lizard	Moderate	Moderate	Moderate
Coast Range newt	Moderate	Moderate	Moderate
Nesting raptors and other protected avian species	High	High	High
Bold indicates a Fort Ord HMP Species.			

Monterey Dusky Footed Woodrat

The Monterey dusky-footed woodrat is a CDFW species of special concern. This is a subspecies of the dusky-footed woodrat (*Neotoma macrotis*), which is common to oak woodlands throughout California. Dusky-footed woodrats are frequently found in forest habitats with moderate canopy cover and a moderate to dense understory; however, they may also be found in chaparral communities. Relatively large nests are constructed of grass, leaves, sticks, and feathers and are built in protected spots, such as rocky outcrops or dense brambles of blackberry (*Rubus sp.*) and/or poison oak. Typical food sources for this species include leaves, flowers, nuts, berries, and truffles. Dusky-footed woodrats may be a significant food source for small- to medium-sized predators. Populations of this species may be limited by the availability of nest material. Within suitable habitat, nests are often found in close proximity to each other.

The CNDDB reports one occurrence of the Monterey dusky-footed woodrat within the quadrangles reviewed, with the occurrence being within five miles of the study areas. No nests were observed during 2019 survey efforts; however, this species is known to occur throughout the former Fort Ord and suitable habitat (i.e., coast live oak woodland and maritime chaparral) is present within the Existing BPS study area and the adjacent to the Intermediate Reservoir and Ord Wellfield study area.

Monterey Ornate Shrew

The Monterey ornate shrew, also known as the Salinas ornate shrew, is a CDFW species of special concern and HMP species. In general, this shrew is common in the southern two-thirds of California west of the Sierra Nevada, from Mendocino to Butte counties, south to the Mexican border. It occupies a variety of mostly moist or riparian woodland habitats and also occurs within chaparral, grassland, and emergent wetland habitats where there is thick duff or downed logs. The breeding season is long; while most pregnancies occur in March and April, they may occur from February through October. The litter size is about six and females may have more than one litter per year. Most individuals do not live to breed a second year. Foraging occurs under logs rocks and leaf litter, and prey items are mostly insects and some other invertebrates.

The CNDDB does not report any occurrences of the Monterey ornate shrew within the seven quadrangles reviewed; however, Figure B-18 in the HMP identifies the Intermediate Reservoir and Ord Wellfield study area as containing potential habitat for this species (ACOE, 1997). As with most shrews, little is known about their ecology since they are hard to locate and do not survive well in traps due to very high metabolic rates. However, field surveys on the UC Fort Ord Natural Reserve found that habitats within or adjacent to the Intermediate Reservoir and Ord Wellfield study area (i.e., coast live oak woodland, coastal scrub, and maritime chaparral) are likely considered suitable habitat for the shrew. Therefore, there is a high potential for the Monterey ornate shrew to occur within these habitats in the Intermediate Reservoir and Ord Wellfield study area. There is a moderate potential for the Monterey ornate shrew to occur within suitable habitat (i.e., maritime chaparral) in the Existing BPS study area well.

California Tiger Salamander

The CTS was listed as a federally threatened species on August 4, 2004 (69 FR 47211-47248). Critical habitat was designated for CTS on August 23, 2005 (70 FR 49379-49458) and went into effect on September 22, 2005. Additionally, CTS was listed as a state threatened species on March 3, 2010. CTS is also a HMP species.

The CTS is a large, stocky salamander most commonly found in annual grassland habitat, but also occurring in the grassy understory of valley-foothill hardwood and chaparral habitats, and uncommonly along stream courses in valley-foothill riparian habitats (Service, 2004). Adults spend most of their lives underground, typically in burrows of ground squirrels and other animals (Service, 2004). The CTS has been eliminated from an estimated 55 percent of its documented historic breeding sites. Currently, about 150 known populations of CTS remain. The CTS persists in disjunct remnant vernal pool complexes in Sonoma County and Santa Barbara County, in vernal pool complexes and isolated stockponds scattered along a narrow strip of rangeland on the fringes of the Central Valley from southern Colusa County south to northern Kern County, and in sag ponds and human-maintained stockponds in the coast ranges from the San Francisco Bay Area south to the Temblor Range.

Above-ground migratory and breeding activity may occur under suitable environmental conditions from mid-October through May. Adults may travel long distances between upland and breeding sites; adults have been found more than two kilometers (1.24 miles) from breeding sites (Service, 2004). Breeding occurs from November to February, following relatively warm rains (Stebbins, 2003). The CTS breeds and lays eggs primarily in vernal pools and other temporary rainwater ponds. Permanent human-made ponds are sometimes utilized if predatory fishes are absent; streams are rarely used for reproduction. Eggs are laid singly or in clumps on both submerged and emergent vegetation and on submerged debris in shallow water (Stebbins, 1972; Jennings and Hayes, 1994). Males typically spend six to eight weeks at breeding ponds, while females typically spend only one to two weeks (Loredo et al., 1996). Eggs hatch within ten to 14 days (Service, 2004) and a minimum of ten weeks is required to complete development through metamorphosis (Jennings and Hayes, 1994), although the larval stage may last up to six months and some larvae in Contra Costa and Alameda Counties may remain in their breeding sites over the summer (Service, 2004).

The study areas are not located within designated critical habitat for CTS. The CNDDB reports 48 occurrences of CTS within the quadrangles evaluated, 20 of which occur within the former Fort Ord. Extensive surveys have been conducted within the former Fort Ord to determine the aquatic resources that are known or have the potential to be occupied by CTS. No potential or known CTS breeding (aquatic)

habitat is present within the study areas. The nearest known CTS-occupied pond is 1.1 mile (1.7 km) from the Intermediate Reservoir and Ord Wellfield study area (**Figure 8**).

The Service and CDFW considers suitable upland aestivation habitat within 2 kilometers and 2.2 kilometers, respectively, of known or potential breeding locations for CTS as occupied habitat unless protocol-level surveys are conducted with negative results pursuant to the *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* (Service and CDFW, 2003). A portion of the Intermediate Reservoir and Ord Wellfield study area is within 2 and 2.2 kilometers of several aquatic resources known or with the potential to be occupied by CTS. **Table 3** presents the area of habitats within the Intermediate Reservoir and Ord Wellfield study area that may be considered by the Service and CDFW as occupied by CTS in the absence of protocol-level surveys. Please note that areas designated as "developed" are not included in these calculations as it is assumed these areas do not provide CTS upland habitat. The Existing and Proposed BPS study areas do not fall within 2 or 2.2 kilometers of any aquatic resources known or with the potential to be occupied by CTS.

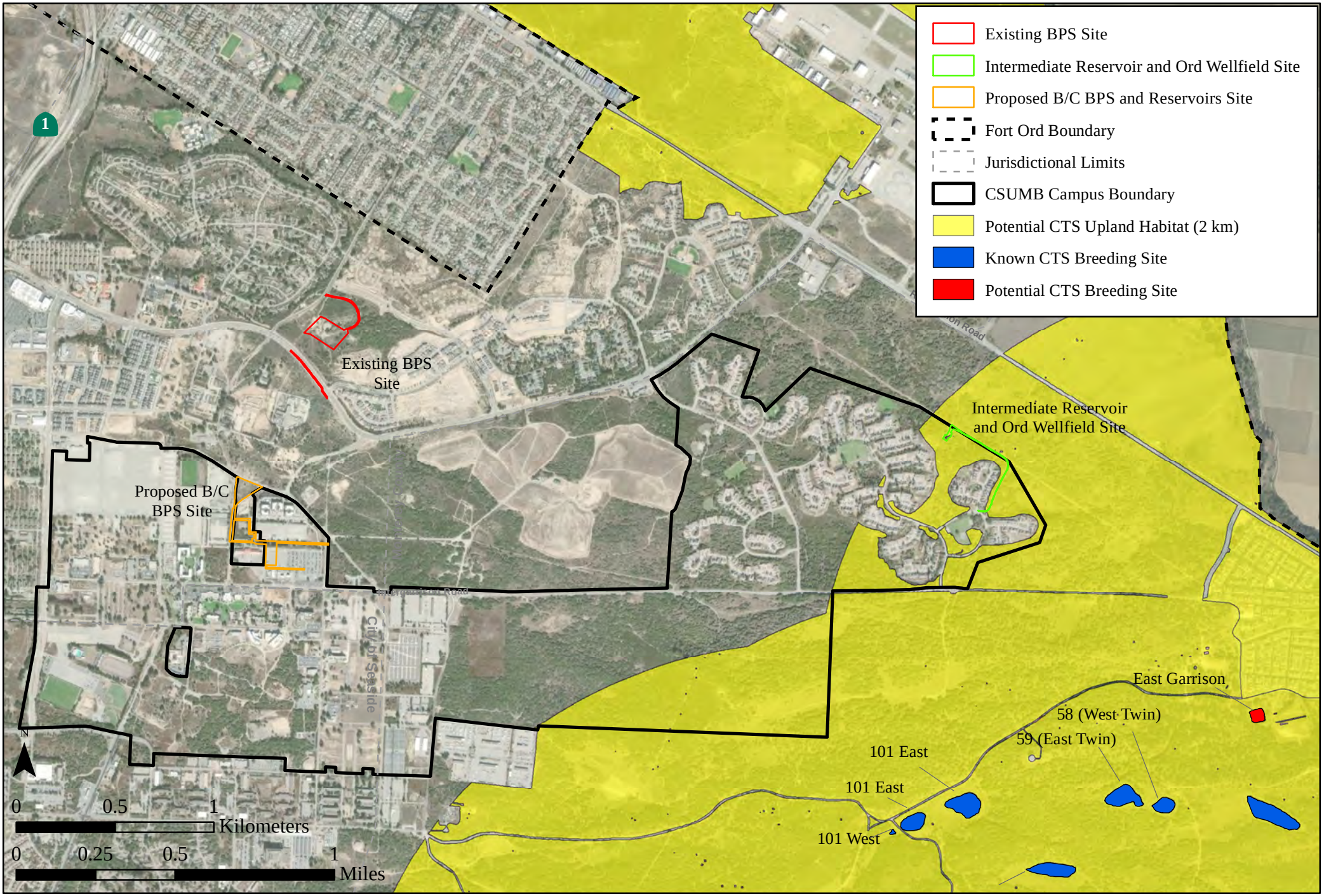
The CDFW uses a four-zone methodology to determine the relative impact of a proposed project to CTS. The zones are as follows:

- Zone 1: 380 meters (0.24 mile) –the distance that greater than 50% of dispersing CTS adults and approximately 50% of dispersing CTS sub-adults will travel from the breeding pond;
- Zone 2: 630 meters (0.39 mile) – the distance within which greater than 95% of dispersing CTS are found;
- Zone 3: 1 km (0.62 mile) – the distance that ongoing studies have shown that adults and juveniles routinely move; and
- Zone 4: 2.2 km (1.3 miles) – the greatest distance adults have been found to move from a breeding site.

A portion of the Intermediate Reservoir and Ord Wellfield study area falls within Zone 4 from aquatic resources known or with the potential to be occupied by CTS. **Table 3** presents the area of habitats within the Intermediate Reservoir and Ord Wellfield study area that fall within Zone 4. Please note that areas designated as "developed" are not included in these calculations as it is assumed these areas do not provide CTS upland habitat. The Existing and Proposed B/C BPS study areas do not fall within any zones, as defined by the CDFW.

Table 3. Area of Potential CTS Habitat within the Intermediate Reservoir and Ord Wellfield Study Area

Habitat	*Service (2 km)*	*CDFW Zone 4 (2.2 km)*
Coast Live Oak Woodland	0.01	0.01
Coastal Scrub	0.01	0.01
Ruderal	0.07	0.07
Total	**0.09**	**0.09**



Potential CTS Aquatic and Upland Habitat Analysis Map

Date: 12/15/2020
Scale: 1 inch = 2,000 feet
Project: 2019-20

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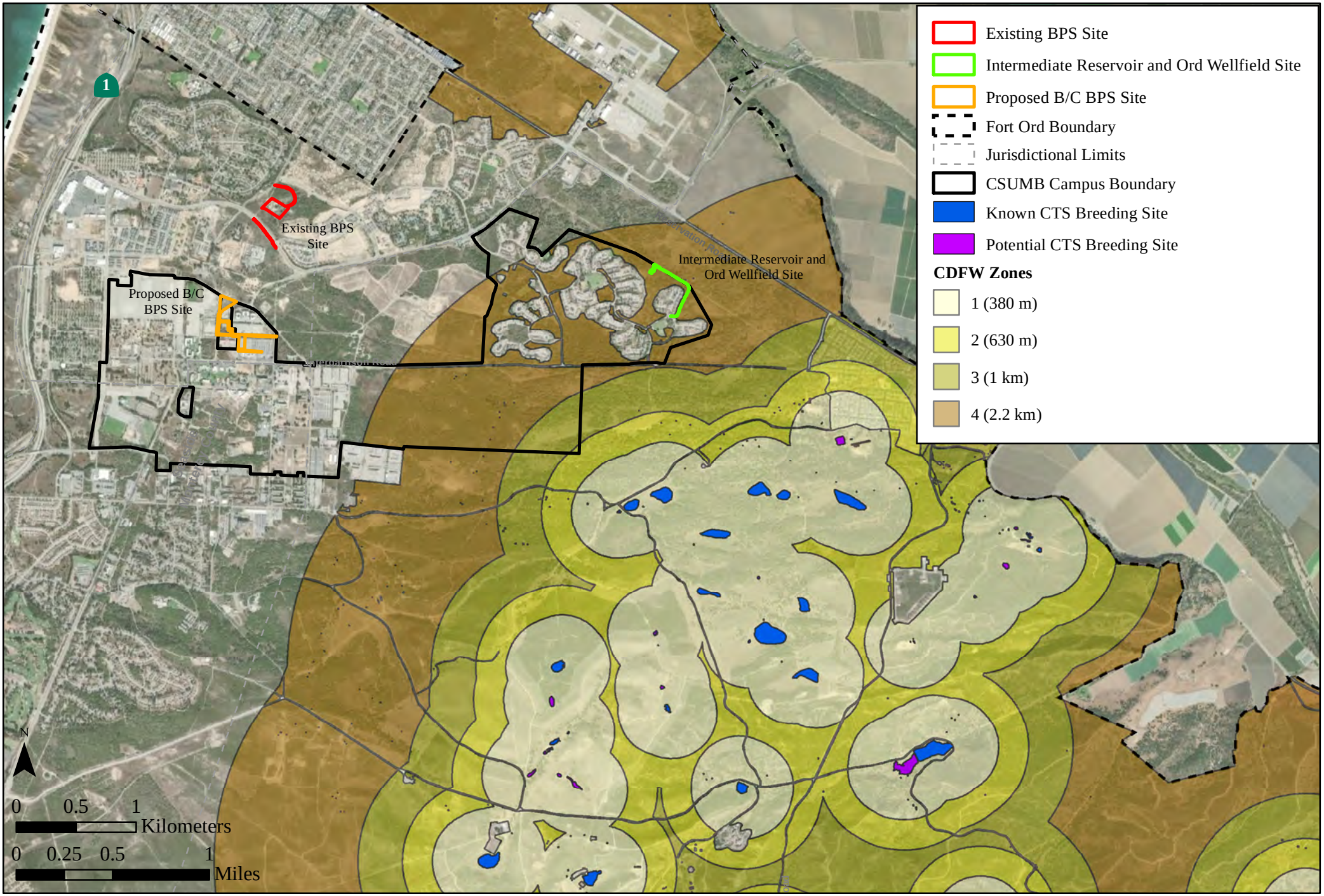
Figure 8



CTS CDFW Analysis Map

Date: 12/15/2020

Scale: 1 inch = 3,000 feet

Project: 2019-20

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Figure 9

Northern California Legless Lizard

The northern California legless lizard is a CDFW species of special concern and HMP species.[4] This fossorial (burrowing) species typically inhabits sandy or loose (friable) soils. Habitats known to support northern California legless lizard include (but are not limited to) coastal dunes, valley and foothill grasslands, chaparral, and coastal scrub at elevations from near sea level to approximately 1,800 meters (6,000 feet). The northern California legless lizard forages on invertebrates beneath the leaf litter or duff layer at the base of bushes and trees or under wood, rocks, and slash in appropriate habitats. The diet of this species likely overlaps to some extent with that of juvenile alligator lizards and perhaps some other salamanders. This species may be preyed upon by alligator lizards, snakes, birds, and small mammals. Little is known about the specific habitat requirements for courtship and breeding; however, the mating season for this species is believed to begin late spring or early summer, with one to four live young born between September and November.

The CNDDB reports 52 occurrences of northern California legless lizard within the quadrangles reviewed, including an occurrence that is directly adjacent to the Proposed B/C BPS study area, and this species is known to occur in several areas of Fort Ord. Suitable habitat for this species is present throughout all undeveloped areas of the study areas where appropriate soil conditions occur. Therefore, there is a high potential for the northern California legless lizard to occur within all of the study areas.

Coast Horned Lizard

The coast horned lizard is a CDFW species of special concern. Horned lizards occur in valley-foothill hardwood, conifer, and riparian habitats, as well as in pine-cypress, juniper, chaparral, and annual grass habitats. This species generally inhabits open country, especially sandy areas, washes, flood plains, and wind-blown deposits in a wide variety of habitats. Coast horned lizards rely on camouflage for protection and will often lay motionless when approached. Horned lizards often bask in the early morning on the ground or on elevated objects such as low boulders or rocks. Predators and extreme heat are avoided by burrowing into loose soil. Periods of inactivity and winter hibernation are spent burrowed into the soil or under surface objects. Little is known about the habitat requirements for breeding and egg-laying of this species. Prey species include ants, beetles, wasps, grasshoppers, flies, and caterpillars.

The CNDDB reports five occurrences of the coast horned lizard within the seven quadrangles reviewed; one occurrence is located within the northeastern portion of the Intermediate Reservoir and Ord Wellfield study area. Additionally, this species has been observed throughout Fort Ord by DD&A biologists. Suitable habitat for this species is present within the maritime chaparral habitat at the Existing BPS study area and coastal scrub habitats found within all of the study areas.

Coast Range Newt

The Coast Range newt, a subspecies of the California newt, is a CDFW species of special concern within all portions of their range south of the Salinas River in Monterey County. This species was historically distributed in coastal drainages from the vicinity of Sherwoods (central Mendocino County) in the North Coast Ranges, south to Boulder Creek, in San Diego County (CDFW, 2008). Populations in southern California appear to be highly fragmented, even historically. This species has been depleted by large-scale

[4] The HMP identifies this species as black-legless lizard (*Anniella pulchra* ssp. *nigra*) in order to differentiate it from the previously identified silvery-legless lizard (*A. p.* ssp. *pulchra*). Currently, CDFW identifies both subspecies as the northern California legless lizard and, therefore, this document follows the current regulatory identification.

historical commercial exploitation coupled with the loss and degradation of stream habitats, particularly in Los Angeles, Orange, Riverside, and San Diego Counties. The records of Slevin (1928) for Baja California are thought to be erroneous (Stebbins, 1951). The known elevation range of this species extends from near sea-level to 1,830 meters (Stebbins, 1985). In central California, breeding appears to occur in two waves, the first in January or February and the second in March or April (Stebbins, 1951; Miller and Robbins, 1954), although Coast Range newts may enter ponds as early as December. Larvae take approximately three to six months to reach metamorphosis and subsist largely on aquatic invertebrates and also conspecifics. Adult Coast Range newts eat a wide variety of aquatic and terrestrial invertebrates (earthworms, insects, snails, beetles, stoneflies, etc.) as well as egg masses, larvae, and carrion.

Breeding and egg-laying occur in intermittent streams, rivers, permanent and semi-permanent ponds, lakes, and large reservoirs. Eggs are laid in small clusters on the submerged portion of emergent vegetation, on submerged vegetation, and on the underside of rocks off the bottom. Coast range newt eggs contain toxic glands which repel many predators. However, Coast Range newt larvae may represent a significant seasonal food for newborn individuals of certain snakes, including California red-sided garter snake (*Thamnophis sirtalis*) and the endangered San Francisco garter snake (*T. s. tetraenia*) (CDFW, 2008).

The CNDDB reports three occurrences of the Coast Range newt within the seven quadrangles reviewed; the nearest occurrence is located approximately 8.2 kilometers from the Intermediate Reservoir and Ord Wellfield study area. While no suitable breeding habitat is present within or adjacent to the study areas, suitable upland habitat (i.e., coastal scrub, maritime chaparral, and coast live oak woodland) is found within all of the study areas.

Nesting Raptors, Migratory Birds, and Other Protected Avian Species

Raptors and their nests are protected under CDFW FGC. While the life histories of these species vary, overlapping nesting and foraging similarities (approximately February through August) allow for their concurrent discussion. Most raptors are breeding residents throughout most of the wooded portions of the state. Stands of coast live oak, riparian deciduous, or other forest habitats, as well as open grasslands, are used most frequently for nesting. Breeding occurs February through August, with peak activity May through July. Prey for these species includes small birds, small mammals, and some reptiles and amphibians. Many raptor species hunt in open woodland and habitat edges. Various species of raptors (such as red-tailed hawk, red-shouldered hawk [*Buteo lineatus*], white-tailed kite, great horned owl, American kestrel, and turkey vulture [*Cathartes aura*]) have the potential to nest within any of the large trees present within or adjacent to the study areas. Additionally, migratory bird species that may be present within the study areas include, but are not limited to, common poorwill, blue-gray gnatcatcher, Townsend's warbler (*Setophaga townsendii*), western tanager (*Piranga ludoviciana*), savannah sparrow, ash-throated fly catcher (*Myiarchus cinerascens*), and violet-green swallow (*Tachycineta thalassina*). Therefore, nesting raptors, migratory birds, and other protected avian species have a high potential to occur within the study areas.

3.3.2 Special-Status Plant Species

As identified in Section 2.0 "Methods," focused botanical surveys for special-status plant species were conducted within the majority of the study areas in 2019. **Table 4** lists the special-status plant species that were observed during these surveys. For the portion of the Intermediate Reservoir and Ord Wellfield study area that was not surveyed, **Table 5** identifies species with a moderate to high potential to occur within the unsurveyed portion.

Table 4. Special-Status Plant Species Observed within the Study Areas

Species	Area of Occurrence					
	Proposed B/C BPS Study Area		Existing BPS Study Area		Intermediate Reservoir and Ord Wellfield Study Area	
	Area	*Individuals*	*Area*	*Individuals*	*Area*	*Individuals*
Monterey ceanothus	1,045 ft²	1	16,947 ft²	-	-	-
Monterey spineflower	-	-	-	-	282 ft²	9
Sand gilia	-	-	14 ft²	-	-	-
Sandmat manzanita	-	-	16,947 ft²	-	-	-
Bold indicates a Fort Ord HMP Species.						

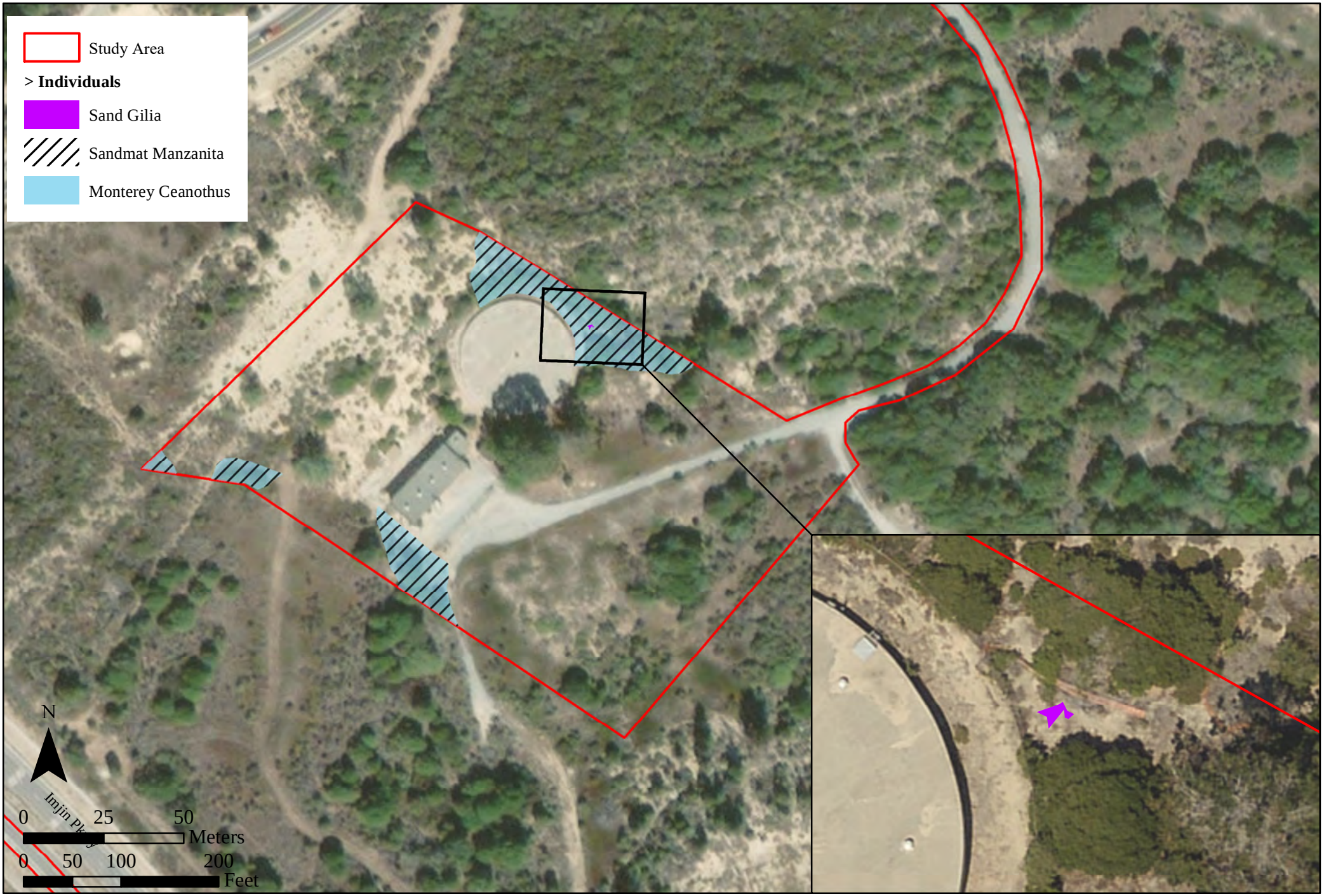
Table 5. Potential Presence of Special-Status Plant Species within the Unsurveyed Portion of the Intermediate Reservoir and Ord Wellfield Study Area

Species	Potential Occurrence
Sandmat manzanita	Moderate
Fort Ord spineflower	Moderate
Sand Gilia	Moderate
Monterey spineflower	High
Bold indicates a Fort Ord HMP Species.	

Sandmat Manzanita

Sandmat manzanita is a CNPS CRPR 1B and HMP species. This evergreen shrub in the Ericaceae family blooms from February to May. Sandmat manzanita is associated with openings in chaparral, coastal scrub, closed cone coniferous forest, coastal dunes, and cismontane woodland habitats on sandy soils at elevations between 3-205 meters.

Approximately 17,000 ft² of sandmat manzanita was identified within the Existing BPS study area during surveys in 2019 (**Figure 10**). Suitable habitat (i.e., ruderal/disturbed) is present within the unsurveyed portion of the Intermediate Reservoir and Ord Wellfield study area and this species has a moderate likelihood to occur.



Existing BPS Site
Special-Status Plant Species Map

Date: 12/15/2020

Scale: 1 inch = 100 feet

Project: 2019-20

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Environmental Consultants Resource Planners
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Figure 10

Monterey Ceanothus

Monterey ceanothus is a CNPS CRPR 1B and HMP species. This evergreen shrub in the Rhamnaceae family blooms from February to April (sometimes through June). This species is associated with closed-cone coniferous forests, chaparral, and coastal scrub on sandy soils at elevations between 3-550 meters.

Approximately 18,000 ft² Monterey ceanothus habitat and a single individual were identified within the Existing and Proposed B/C BPS s study areas during the 2019 botanical surveys (**Figures 10** and **11**). Suitable habitat for this species is not present within the unsurveyed portion of the Intermediate Reservoir and Ord Wellfield study area and this species has a low likelihood to occur in that study area.

Fort Ord Spineflower

Fort Ord spineflower is a CNPS CRPR 1B species. This annual herb in the Polygonaceae family is associated with sandy openings of maritime chaparral and coastal scrub at elevations of 55-150 meters. The blooming period is April to July.

The CNDDB reports five occurrences of Fort Ord spineflower within the seven quadrangles evaluated, the nearest of which is 2.5 kilometers from the Intermediate Reservoir and Ord Wellfield study area. This species was not observed within the study areas during surveys in 2019. However, suitable habitat (i.e., ruderal/disturbed) is present within the unsurveyed portion of the Intermediate Reservoir and Ord Wellfield study area and this species has a moderate likelihood to occur in that study area.

Monterey Spineflower

Monterey spineflower is a federally threatened, CNPS CRPR 1B, and HMP species. It is a small, prostrate annual herb in the Polygonaceae family that blooms from April to June. Monterey spineflower typically occurs on open sandy or gravelly soils on relic dunes in coastal dune, coastal scrub, and maritime chaparral habitats, though it can also be associated with cismontane woodlands and valley and foothill grasslands, within a range of 3-450 meters in elevation.

Approximately 282 ft² and nine individuals of Monterey spineflower were identified within the Intermediate Reservoir and Ord Wellfield study area during the 2019 botanical surveys (**Figure 12**). Suitable habitat (i.e., ruderal/disturbed) is present within the unsurveyed portion of the Intermediate Reservoir and Ord Wellfield study area and this species has a high likelihood to occur in that study area.

Proposed B/C BPS and A1/A2 Reservoirs Site Special-Status Plant Species Map

Date: 12/15/2020
Scale: 1 inch = 80 feet
Project: 2019-20

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Figure 11

Intermediate Reservoir and Ord Wellfield Site Special-Status Plant Species Map

Date: 12/15/2020
Scale: 1 inch = 100 feet
Project: 2019-20

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Figure 12

Sand Gilia

Sand gilia is a federally endangered, state threatened, CNPS CRPR 1B, and HMP species. This annual herb in the Polemoniaceae blooms from April through June and is found in sandy openings of maritime chaparral, cismontane woodland, coastal dune, and coastal scrub habitats within the range of 0-45 meters in elevation.

Approximately 14 ft^2 of sand gilia was identified within the Existing BPS study area during the 2019 botanical surveys (**Figure 10**). Suitable habitat (i.e., ruderal/disturbed) is present within the unsurveyed portion of the Intermediate Reservoir and Ord Wellfield study area and this species has a moderate likelihood to occur in that study area.

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4.0 IMPACTS AND MITIGATION MEASURES

4.1 THRESHOLDS OF SIGNIFICANCE

For the purposes of this analysis, an impact is considered to be significant and require mitigation if it would result in any of the following:

a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or the Service;

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by CDFW or the Service;

c. Have a substantial adverse effect on state or federally protected wetlands, including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means:

d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native nursery sites;

e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

4.2 APPROACH TO ANALYSIS

The following impact analysis addresses direct and indirect impacts that may result from implementation of the proposed project. Direct impacts are those effects of a project that occur at the same time and place of project implementation, such as removal of habitat from ground disturbance. Indirect impacts are those effects of a project that occur either later in time or at a distance from the project location but are reasonably foreseeable, such as loss of excessive erosion caused by vegetation removal. Direct and indirect impacts can also vary in duration and result in temporary, short-term, and long-term effects on biological resources. A temporary effect would occur only during the activity. A short-term effect would last from the time an activity ceases to some intermediate period of approximately one to five years (i.e., repopulation of habitat following restoration). A long-term or permanent effect would last longer than five years after an activity ceases. Long-term effects may include the ongoing maintenance and operation of a project or may result in a permanent change in the condition of a resource, in which case it could be considered a permanent impact.

The project sites are located within parcels designated as “development” under the approved HMP (Parcel Numbers L24, S1.1.2, E4.5, E2c.4.1.1, and S1.2.1). As described above, parcels designated as “development” have no development restrictions or habitat management requirements. However, the 2017 Programmatic BO and HMP require the identification of sensitive botanical resources within these parcels that may be salvaged for use in restoration activities in reserve areas. Within all parcels, the HMP recommends preservation of native vegetation and HMP species habitat outside of areas identified for development. Impacts to HMP species and habitats occurring within the designated development parcels

were anticipated and mitigated through the establishment of habitat reserves and corridors and the implementation of habitat management requirements within habitat reserve parcels on former Fort Ord.

The HMP species that are known or have a moderate to high potential to occur within the study areas include Monterey ornate shrew, CTS, Northern California legless lizard, sandmat manzanita, Monterey spineflower, sand gilia, and Monterey ceanothus. With the designated habitat reserves and corridors and habitat management requirements of the HMP in place, the loss of these species is not expected to jeopardize the long-term viability of these species and their populations on the former Fort Ord (USFWS, 1993). This is such because the recipients of disposed land with development restrictions or habitat management requirements under the HMP are obligated to implement those specific measures through the HMP and deed covenants. In addition to the HMP species identified, impacts to maritime chaparral habitat are also addressed in the HMP and, therefore, impacts to this habitat are also considered mitigated through the implementation of the HMP based on the same conclusions. The proposed project is:

1. Located within designated "development" parcels;
2. Required to comply with the habitat management restrictions identified in the HMP; and
3. Would not result in any additional impacts to HMP species and habitats beyond those anticipated in the HMP.

The City and CSUMB are required to implement HMP requirements in accordance with the deed covenants that apply to the project sites. The HMP and 2017 Programmatic BO require the identification of sensitive biological resources within development parcels that may be salvaged for use in restoration activities in habitat reserve areas. In addition, the HMP requires that land recipients prepare and implement RMPs and BMPs for specified parcels within their respective jurisdictions. While the proposed project would occur in designated development parcels, the City and CSUMB are required to have approved RMPs and BMPs for the specified parcels in their jurisdiction in order to be considered in compliance with the HMP. If the City and CSUMB are in compliance with the HMP and 2017 Programmatic BO, impacts to these special-status species would be less than significant and no additional mitigation measures for these HMP species would be required.[5] However, if the City and/or CSUMB are not in compliance with the HMP and 2017 Programmatic BO, then impacts to HMP species would be potentially significant and additional mitigation measures may be required.

However, as described above, the HMP does not exempt existing or future land recipients from the federal and state requirements of ESA and CESA. Of the HMP species known or with the potential to occur within the study areas, there are two federal and/or state listed species that would require take authorization from the resource agencies (Service and/or CDFW) if impacts would occur as a result of the proposed project: sand gilia, federal endangered and state threatened; and CTS, federal and state threatened. Therefore, although these species are HMP species, the take of these species is prohibited under the ESA and/or CESA. Development resulting in take of these species would need to be authorized by the Service and/or CDFW through the issuance of incidental take permits from the applicable agency to avoid violation under the ESA and/or CESA.

Where suitable habitat exists within the study areas, the proposed project has the potential to impact special-status species that were not addressed in the HMP. The non-HMP species that are known or have a

[5] With the exception of species that require take authorization.

moderate to high potential to occur within and may be impacted by the project include: Fort Ord spineflower, Monterey dusky-footed woodrat, coast horned lizard, Coast Range newt, and nesting raptors and other protected avian species.

4.3 AREAS OF NO IMPACT

Criterion "c" is not evaluated for impacts to State or Federally protected wetlands as there are none present within or adjacent the project sites, and thus, would not be impacted by the proposed project.

4.4 IMPACTS AND MITIGATION MEASURES

Impact BIO-1: *Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or the Service.*

Existing BPS Study Area

HMP Special-Status Species

The Existing BPS study area is located within HMP parcels E4.3.11 and E4.5, which are designated as "development." Five HMP special-status species are known or have the potential to occur within the study area at the Existing BPS study area: Monterey ceanothus, sand gilia, and sandmat manzanita, Monterey ornate shrew, and Northern California legless lizard.

Construction activities at the Existing BPS study area would involve the relocation of a generator inside the existing building and installation of a new pipeline within the Imjin Parkway and California Avenue ROW (i.e., within existing pavement). No vegetation removal or disturbance would occur and impacts to these species would be avoided. Any future demolition and/or decommissioning activities at this study area are not included as part of the proposed project. Therefore, no impacts to the five HMP special-status species would occur.

Non-HMP Special-Status Species

Suitable habitat for two non-HMP special-status species is present within the Existing BPS study area: the Monterey dusky-footed woodrat, coast horned lizard, and Coast Range newt. Additionally, nesting raptors and other protected avian species may occur. However, construction activities at the Existing BPS study area would involve the relocation of a generator inside the existing building and installation of a new pipeline within the Imjin Parkway and California Avenue road ROW (i.e., within existing pavement). No vegetation removal or disturbance would occur and impacts to these species would be avoided. As discussed above, any future demolition and/or decommissioning activities at this study area are not included as part of the proposed project. Therefore, no impacts to non-HMP special-status species would occur.

Proposed BPS Study Area

HMP Special-Status Species

The Proposed B/C BPS study area is located within HMP parcels L5.8.1, L5.8.2, and S1.5.2, which are designated as "development." One HMP plant species (Monterey ceanothus) is known to occur within the study area at the Proposed B/C BPS study area. Additionally, one HMP wildlife species (Northern

California legless lizard) has a high potential to occur within the undeveloped areas of the study area at this study area.

Within the study area, Monterey ceanothus was observed at the intersection of 5th Avenue and 8th Street outside the existing percolation pond. However, no construction activities are proposed within or adjacent to the percolation pond. No vegetation removal or disturbance would occur and impacts to this species would be avoided. The proposed project would involve adding a flow-spitting manhole in 5th Avenue within existing pavement, to prevent surcharging the storm drain if an overflow should occur during a large rain event. If such an event occurred, the pond has sufficient capacity to capture an overflow without directly or indirectly affecting the Monterey ceanothus, which are located along the top perimeter of the pond. Therefore, no impacts to this species would occur.

Suitable habitat for the Northern California legless lizard is present within the vegetated areas that would be impacted by construction of the A1/A2 reservoirs and B/C BPS. Construction activities could result in impacts to this species, including loss of individuals, soil compaction, dust, loss of habitat, erosion, and introduction and spread of non-native, invasive species. This is a potentially significant impact.

As described in the "Approach to Analysis" section, impacts to special-status species addressed in the HMP within development parcels would be less than significant if the City and/or CSUMB are in compliance with the HMP and 2017 Programmatic BO. The 2017 Programmatic BO and HMP require the identification of sensitive botanical resources within the development parcels that may be salvaged for use in restoration activities in reserve areas. In addition to the salvage requirements, although the proposed project would occur in designated development parcels, the City and/or CSUMB are required to have approved RMPs and BMPs for the identified parcels in their jurisdiction in order to be considered in compliance with the HMP. If the City and/or CSUMB are in compliance with the requirements of the HMP and 2017 Programmatic BO, impacts to the Northern California legless lizard within the Proposed B/C BPS study area would be less than significant and no additional mitigation is required.

However, in the event that the City and/or CSUMB are not in compliance with the HMP and 2017 Programmatic BO, **Mitigation Measures BIO-1** through **BIO-3** have been identified to mitigate for potential impacts to the Northern California legless lizard. These measures include implementing construction best management practices, monitoring, and invasive species controls, would reduce potentially significant impacts to this species to a less-than-significant level. Implementation of **Mitigation Measures BIO-1** through **BIO-3** would reduce potentially significant impacts to the Northern California legless lizard in the event that the City and/or CSUMB are not in compliance with the HMP and 2017 Programmatic BO.

Therefore, potential impacts to HMP special-status species at the Proposed BPS study area would be reduced to a less-than-significant level with implementation of **Mitigation Measures BIO-1** through **BIO-3**.

Non-HMP Special-Status Species

Suitable habitat for two non-HMP special-status species is present within the Proposed B/C BPS study area: the coast horned lizard and Coast Range newt. Additionally, nesting raptors and other protected avian species may be present. Project implementation could result in direct impacts to individuals and loss of habitat for these species. Construction-related activities (e.g., removal of vegetation, equipment noise,

vibration) could also result in raptor and protected avian species nest abandonment. These are potentially significant impacts.

Implementation of **Mitigation Measures BIO-1** through **BIO-4**, which avoid and minimize impacts through implementing construction best management practices, monitoring, invasive species controls, and pre-construction surveys would reduce potentially significant impacts to these species to a less-than significant-level.

Therefore, potential impacts to non-HMP special-status species at the Proposed BPS study area would be reduced to a less-than-significant level with implementation of **Mitigation Measures BIO-1** though **BIO-4**.

Intermediate Reservoir and Ord Wellfield Study Area

HMP Special-Status Species

The Intermediate Reservoir and Ord Wellfield study area is located within HMP parcel S1.2.1, which is designated as "development." Three HMP wildlife species (i.e., Monterey ornate shrew, CTS, and Northern California legless lizard) have a moderate to high potential to occur within suitable habitat in the study area at this study area.

However, construction activities at the Intermediate Reservoir and Ord Wellfield study area would primarily occur within existing developed and ruderal/disturbed areas. Ground disturbance for construction activities at the Intermediate Reservoir, F BPS, and Ord Wellfield Chlorination Building would be less than 1,000 sf to install valves and vaults, run new conduits, and add a service tap, primarily within the existing dirt and gravel roadways. The remaining improvements would occur within developed areas and would not require ground disturbance (i.e., replace generator and altitude valve, recoat water tank, and update SCADA system).

As a result, potential impacts to suitable habitat for HMP wildlife species would be avoided and impacts to these HMP wildlife species would be less than significant. However, because CTS is listed under ESA and CESA, **Mitigation Measure BIO-5**, which requires construction surveys and monitoring, is identified to further reduce potential impacts to this species and avoid take under Section 10 and Section 2081 of the ESA and CESA.

One HMP plant species (Monterey spineflower) was identified within the study area during the surveys in 2019; however, two additional HMP plant species (sandmat manzanita and sand gilia) have a moderate potential to occur within the unsurveyed portion of the study area. Construction activities could result in impacts to these species, including loss of individuals, soil compaction, dust, loss of habitat, erosion, and introduction and spread of non-native, invasive species. This is a potentially significant impact.

Mitigation Measure BIO-6 would be implemented to identify the presence of Monterey spineflower, sandmat manzanita, and sand gilia within unsurveyed portion of the Intermediate Reservoir and Ord Wellfield study area. If these HMP plant species are identified, implementation of **Mitigation Measure BIO-6** would reduce potential impacts to a less-than-significant level by requiring pre-construction surveys, salvage, avoidance, compliance with the CESA (as applicable), and replacement of impacted plant species at a 1:1 ratio and implementation of a Rare Plant Restoration Plan (if not in compliance with the HMP and 2017 Programmatic BO).

As described in the "Approach to Analysis" section, impacts to special-status species addressed in the HMP within development parcels would be less than significant if the City is in compliance with the HMP and 2017 Programmatic BO. The 2017 Programmatic BO and HMP require the identification of sensitive botanical resources within the development parcels that may be salvaged for use in restoration activities in reserve areas. Implementation of **Mitigation Measure BIO-7** would ensure compliance with the salvage requirements identified in the HMP and 2017 Programmatic BO. In addition to the salvage requirements, although the proposed project would occur in designated development parcels, the City is required to have approved RMPs and BMPs for the identified parcels in their jurisdiction in order to be considered in compliance with the HMP. If the City is in compliance with the requirements of the HMP and 2017 Programmatic BO, impacts to HMP species within the Intermediate Reservoir and Ord Wellfield study area would be less than significant and no additional mitigation is required.[6]

However, in the event that the City is not in compliance with the requirements of the HMP and 2017 Programmatic BO, **Mitigation Measure BIO-8** has been identified to mitigate for potential impacts to Monterey spineflower (as well as sandmat manzanita and sand gilia, if determined present and would be impacted by the proposed project). This measure includes replacement of impacted plant species at a 1:1 ratio and implementation of a Rare Plant Restoration Plan. Implementation of **Mitigation Measure BIO-8** would reduce potentially significant impacts to Monterey spineflower (as well as sandmat manzanita and sand gilia, if determined present and would be impacted by the proposed project) in the event that the City is not in compliance with the HMP and 2017 Programmatic BO.

In addition, although sand gilia is a HMP species, it is also listed under the ESA and CESA. The HMP does not exempt existing or future land recipients from the federal and state requirements of ESA and CESA and impacts to this species would be considered a significant impact even with implementation of **Mitigation Measures 9-10**. As described in Section 2.5 "Regulatory Setting," if there is the potential for incidental take of a state listed plant species, take of the listed species can be authorized through the incidental take permit process. Therefore, if the project would result in impacts to sand gilia, the MCWD would be required to comply with the CESA by retaining an incidental take permit from the CDFW.

Implementation of **Mitigation Measures BIO-1** through **BIO-3** have been identified to reduce potentially significant impacts to the Northern California legless lizard; however, these HMP species would also benefit from the implementation of these measures. These measures would reduce construction-related impacts through a combination of protective measures during all phases of construction, education, monitoring, and invasive species controls and further reduce impacts to these species.

Therefore, potential impacts to HMP special-status species resulting from proposed activities within the Intermediate Reservoir and Ord Wellfield study area would be reduced to a less-than-significant level with implementation of **Mitigation Measures BIO-5** through **BIO-10**. Implementation of **Mitigation Measures BIO-1** through **BIO-3** would further reduce impacts to these species.

[6] With the exception of species that require take authorization.

Non-HMP Special-Status Species

Suitable habitat for the following non-HMP special-status species is present within the Intermediate Reservoir and Ord Wellfield study area: Monterey dusky-footed woodrat, coast horned lizard, and Coast Range newt. Additionally, nesting raptors and other protected avian species have the potential to occur.

However, construction activities at the Intermediate Reservoir and Ord Wellfield study area would primarily occur within existing developed and ruderal/disturbed areas and is not proposed within suitable habitat for Monterey dusky-footed woodrat, coast horned lizard, and Coast Range newt. Ground disturbance for construction activities at the Intermediate Reservoir, F BPS, and Ord Wellfield Chlorination Building would be less than 1,000 sf to install valves and vaults, run new conduits, and add a service tap, primarily within the existing dirt and gravel roadways. The remaining improvements would occur within developed areas and would not require ground disturbance (i.e., replace generator and altitude valve, recoat water tank, and update SCADA system). As a result, potential impacts to suitable habitat for Monterey dusky-footed woodrat, coast horned lizard, and Coast Range newt would be avoided and impacts would be less than significant.

No trees or other suitable nest habitat are proposed for disturbance or removal at the Intermediate Reservoir and Ord Wellfield study area. However, construction-related activities (e.g., removal of vegetation, equipment noise, vibration) adjacent to trees and other suitable nesting habitat could result in raptor and protected avian species nest abandonment. This is a potentially significant impact. Implementation of **Mitigation Measures BIO-4** which requires pre-construction surveys would reduce potentially significant impacts to nesting raptors and other protected avian species to a less-than-significant level.

Mitigation Measure BIO-6 would be implemented to identify the presence of Fort Ord spineflower within unsurveyed portion of the Intermediate Reservoir and Ord Wellfield study area. If this species is identified, implementation of **Mitigation Measure BIO-6** would reduce potential impacts to a less-than-significant level by requiring pre-construction surveys, avoidance, and replacement of impacted plant species at a 1:1 ratio and implementation of a Rare Plant Restoration Plan.

Implementation of **Mitigation Measures BIO-1** through **BIO-3** have been identified to reduce potentially significant impacts to the Northern California legless lizard; however, these species would also benefit from the implementation of these measures. These measures would reduce construction-related impacts through a combination of protective measures during all phases of construction, education, monitoring, and invasive species controls and further reduce impacts to these species.

Therefore, potential impacts to non-HMP special-status species resulting from proposed activities within the Intermediate Reservoir and Ord Wellfield study area would be less than significant with implementation of Mitigation Measures BIO-4 and BIO-6. Implementation of **Mitigation Measures BIO-1** through **BIO-3** would further reduce impacts to these species.

Mitigation Measure BIO-1: Construction Best Management Practices

The following best management practices will be implemented during all identified phases of construction (i.e., pre-, during, and post-) to reduce impacts to special-status plant and wildlife species:

- A qualified biologist will conduct an Employee Education Program for the construction crew prior to any construction activities. The qualified biologist will meet with the construction crew

at the onset of construction at the project site to educate the construction crew on the following: 1) the appropriate access route(s) in and out of the construction area and review project boundaries; 2) how a biological monitor will examine the area and agree upon a method which will ensure the safety of the monitor during such activities, 3) the special-status species that may be present; 4) the specific mitigation measures that will be incorporated into the construction effort; 5) the general provisions and protections afforded by the Service and CDFW; and 6) the proper procedures if a special-status species is encountered within the project site.

- Protective fencing shall be placed prior to and during construction to keep construction equipment and personnel from impacting vegetation outside of work limits. A biological monitor shall supervise the installation of protective fencing and monitor at least once per week until construction is complete to ensure that the protective fencing remains intact.
- Trees and vegetation not planned for removal or trimming shall be protected prior to and during construction to the maximum extent possible through the use of exclusionary fencing, such as hay bales for herbaceous and shrubby vegetation, and protective wood barriers for trees. Only certified weed-free straw shall be used, to avoid the introduction of non-native, invasive species. A biological monitor shall supervise the installation of protective fencing and monitor at least once per week until construction is complete to ensure that the protective fencing remains intact.
- Grading, excavating, and other activities that involve substantial soil disturbance will be planned and implemented in consultation with a qualified hydrologist, engineer, or erosion control specialist, and will utilize standard erosion control techniques to minimize erosion and sedimentation to native vegetation adjacent to the project site (pre-, during, and post-construction).
- Following construction, disturbed areas will be restored to pre-project contours to the maximum extent possible and revegetated using locally-occurring native species and native erosion control seed mix, per the recommendations of a qualified biologist.
- To protect against spills and fluids leaking from equipment, the project proponent shall require that the construction contractor maintains an on-site spill plan and on-site spill containment measures that can be easily accessed.
- No firearms will be allowed on the project site at any time.
- All food-related and other trash will be disposed of in closed containers and removed from the project area at least once a week during the construction period, or more often if trash is attracting avian or mammalian predators. Construction personnel will not feed or otherwise attract wildlife to the area.

Mitigation Measure BIO-2: Construction-Phase Monitoring

MCWD shall retain a qualified biologist to monitor all ground disturbing construction activities (i.e., vegetation removal, grading, excavation, or similar activities) associated with the project to protect any special-status species encountered. Any handling and relocation protocols of special-status wildlife species will be determined in coordination with CDFW prior to any ground disturbing activities and will be conducted by a qualified biologist with appropriate scientific collection permit. After ground disturbing project activities are complete, the qualified biologist will train an individual from the construction crew to act as the on-site construction biological monitor. The construction biological

monitor will be the contact for any special-status wildlife species encounters, will conduct daily inspections of equipment and materials stored on site and any holes or trenches prior to the commencement of work, and will ensure that all installed fencing stays in place throughout the construction period. The qualified biologist will then conduct regular scheduled and unscheduled visits to ensure the construction biological monitor is satisfactorily implementing all appropriate mitigation protocols. Both the qualified biologist and the construction biological monitor must work through the State Inspector to cease construction contractor work and/or redirect project activities to ensure protection of resources and compliance with all environmental permits and conditions of the project. The qualified biologist and the construction monitor shall complete a daily log summarizing activities and environmental compliance throughout the duration of the project. The log will also include any special-status wildlife species observed and relocated.

Mitigation Measure BIO-3: Non-Native, Invasive Species Controls

The following measures will be implemented to reduce the introduction and spread of non-native, invasive species:

- Any landscaping or replanting required for the project will not use species listed as noxious by the California Department of Food and Agriculture (CDFA) or invasive by the California Invasive Plant Council (Cal-IPC).

- Bare and disturbed soil will be landscaped with CDFA recommended seed mix or plantings from locally adopted species to preclude the invasion on noxious weeds in the project site.

- Construction equipment will be cleaned of mud or other debris that may contain invasive plants and/or seeds and inspected to reduce the potential of spreading noxious weeds, before mobilizing to arrive at the construction site and before leaving the construction site.

- All non-native, invasive plant species will be removed from disturbed areas prior to replanting.

Mitigation Measure BIO-4: Pre-Construction Surveys for Nesting Raptors and Avian Species

Construction activities that may directly (e.g., vegetation removal) or indirectly (e.g., noise/ground disturbance) affect nesting raptors and avian species will be timed to avoid the breeding and nesting season. Specifically, vegetation and/or tree removal can be scheduled after September 16 and before January 31. Alternatively, a qualified biologist will be retained by the project applicant to conduct pre-construction surveys for nesting raptors and other protected avian species within 500 feet of proposed construction activities if construction occurs between February 1 and September 15. Pre-construction surveys will be conducted no more than 14 days prior to the start of construction activities during the early part of the breeding season (February through April) and no more than 30 days prior to the initiation of these activities during the late part of the breeding season (May through August). Because some bird species nest early in spring and others nest later in summer, surveys for nesting birds may be required to continue during construction to address new arrivals, and because some species breed multiple times in a season. The necessity and timing of these continued surveys will be determined by the qualified biologist based on review of the final construction plans and in coordination with the CDFW, as needed.

If raptors or other protected avian species nests are identified during the pre-construction surveys, the qualified biologist will notify the project applicant and an appropriate no-disturbance buffer will be imposed within which no construction activities or disturbance should take place (generally 500 feet in all directions for raptors; other avian species may have species-specific requirements) until the young of the year have fledged and are no longer reliant upon the nest or parental care for survival, as determined by a qualified biologist.

Mitigation Measure BIO-5: California Tiger Salamander Avoidance Measures

The following measures will be implemented to avoid impacts to CTS at the Intermediate Reservoir and Ord Wellfield site:

- A Service and CDFW-approved biologist will monitor initial ground disturbing construction activity for a sufficient amount of time to train an individual to act as the on-site construction monitor. This would typically take two days. The determination of when the construction monitor is sufficiently trained to act independently shall be made by the qualified biologist and may be less or more than two days. The construction monitor will have attended the training described below. Both the Service and CDFW-approved biologist and the construction monitor will have the authority to stop and/or redirect project activities to ensure protection of resources and compliance with all environmental permits and conditions of the project. The construction monitor is not authorized to capture or handle CTS. The construction monitor will complete a daily log summarizing activities and environmental compliance.

- Before ground disturbing work activities begin each day, the construction monitor will conduct a pre-construction survey and inspect under construction equipment and materials to look for CTS. If a CTS is found during these checks or during construction, the construction monitor will halt work that may affect the animal until the Service and CDFW-approved biologist is notified. The Service and CDFW-approved biologist will notify the Service and CDFW of any CTS encounters within 48 hours. The MCWD will consult with the Service and CDFW to ensure compliance with the ESA and CESA and obtain any necessary permits.

- A Service and CDFW-approved biologist will train all project staff regarding habitat sensitivity, identification of special-status species, and required practices before the start of construction. The training will include a brief review of the biology of the covered species, the general measures that are being implemented to conserve these species as they relate to the project, guidelines to avoid impacts to these species during the construction period, the penalties for non-compliance, and the boundaries of the project area. A fact sheet or other supporting materials containing this information will be prepared and distributed. Upon completion of training, employees will sign a form stating that they attended the training and understand all the conservation and protection measures. Educational programs will be conducted for new personnel before they join construction activities. The crew foreman will be responsible for ensuring that all crew members comply with the guidelines.

- Work will be postponed if chance of rain is greater than 70% based on the NOAA National Weather Service forecast or within 48 hours following a rain event greater than 0.1 inch. If an unpredicted rainfall event commences while construction activities are in progress, the applicant will suspend all work activities and equipment and personnel will be demobilized. Equipment

may be moved to a designated staging area until work is allowed to resume. The designated area will be a hard surface devoid of small mammal burrows. A Service and CDFW-approved biologist would survey the project site immediately before resuming project activities.

- The project site and driveway will be closed to all construction activities and traffic one half hour before sunset and will not begin prior to one half hour after sunrise.

- All construction-related vegetative debris (e.g., larger brush, tree limbs, tree trunks) will be hauled offsite daily for disposal.

- To prevent inadvertent entrapment of CTS during construction, all excavated, steep-walled holes or trenches more than two (2) feet deep will be covered at the close of each working day with plywood or similar materials. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If holes or trenches are too large to be covered, the construction crew will place adequate means of escape (earthen ramps not more than 2:1 slope, wooden boards, etc.) to allow animals to exit.

- During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.

- All refueling, maintenance, and staging of equipment and vehicles will occur at least 100 feet from water bodies and in a location from where a spill would not drain directly toward aquatic habitat (e.g., on a slope that drains away from the water). The construction monitor will ensure contamination of habitat does not occur during such operations. Prior to the onset of work, the contractor will ensure that a plan is in place for prompt and effective response to any accidental spills. All workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

- Only tightly woven fiber netting or similar material may be used for erosion control at the project site. Coconut coir matting is an acceptable erosion control material. No plastic mono-filament matting will be used for erosion control, as this material may ensnare wildlife, including.

Mitigation Measure BIO-6: Pre-Construction Special-Status Plant Surveys

A qualified biologist shall be retained to conduct pre-construction surveys for sandmat manzanita, Monterey spineflower, Fort Ord spineflower, and sand gilia within the unsurveyed portion of the Intermediate Reservoir and Ord Wellfield site. The surveys shall be conducted during the appropriate identification period(s) to determine presence or absence, according to USFWS, CDFW, and CNPS protocol. The biologist shall prepare a report that provides the results of the survey, and, if found the number and locations of individuals/populations identified.

- If no special-status plant species are identified, no further mitigation is necessary.
- If special-status HMP plant species are identified, **Mitigation Measures BIO-7** through **BIO-10** shall be implemented, as appropriate.
- If special-status non-HMP plant species are identified, impacts to these individuals or populations shall be avoided through project design and modification to the extent feasible. If avoidance is

not feasible, a Rare Plant Restoration Plan shall be prepared by a qualified biologist and implemented. The plan shall include, but is not limited to, the following:

- A description of the baseline conditions of the work site, including locations and densities of the special-status plant species present;
- Procedures to control and/or eliminate non-native invasive species within the work site;
- A detailed description of on-site and/or off-site restoration areas, salvage of seed and/or soil bank, plant salvage, seeding and planting specifications, including increased planting ratio to ensure the 1:1 success ratio; and
- A monitoring program that describes annual monitoring efforts which incorporate success criteria and contingency plans if success criteria are not met.

Mitigation Measure BIO-7: HMP Plant Species Salvage

Prior to construction, salvage efforts for HMP species that do not require take authorization from the USFWS or CDFW will be evaluated by a qualified biologist in coordination with the to further reduce impacts per the requirements of the HMP and 2017 Programmatic BO. Where salvage is determined feasible and proposed, seed collection should occur from plants within the development site and/or topsoil should be salvaged within occupied areas to be disturbed. Seeds should be collected during the appropriate time of year for each species by qualified biologists. The collected seeds and topsoil should be used to revegetate temporarily disturbed construction areas and reseeding and restoration efforts on- or off-site, as determined appropriate by the qualified biologist and MCWD. For HMP species that require take authorization from the USFWS or CDFW, any additional salvage measures identified in the take authorization(s) shall be followed.

Mitigation Measure BIO-8: HMP and 2017 Programmatic BO Compliance

If the City and/or CSUMB are not in compliance with the HMP and the 2017 Programmatic BO, impacts to sandmat manzanita and Monterey spineflower shall be replaced at a 1:1 success ratio for the acreage or individuals impacted (depending on species impacted) and a Rare Plant Restoration Plan shall be prepared by a qualified biologist and implemented. The plan shall include, but is not limited to, the following:

- A description of the baseline conditions of the habitats within the work site, including the presence of any special-status species, their locations, and densities;
- Procedures to control and/or eliminate non-native invasive species within the work site;
- Provisions for ongoing training of facility maintenance personnel to ensure compliance with the requirements of the plan;
- A detailed description of on-site and/or off-site restoration areas, salvage of seed and/or soil bank, plant salvage, seeding and planting specifications, including increased planting ratio to ensure the 1:1 success ratio; and
- A monitoring program that describes annual monitoring efforts which incorporate success criteria and contingency plans if success criteria are not met.

Mitigation Measure BIO-9: Federal and State Listed Plant Species Avoidance

Federal and state listed plant species shall be avoided to the greatest extent feasible. Individuals or populations that will not be impacted by the project shall be protected prior to and during construction to the maximum possible through the use of exclusionary fencing and/or flagging. A biological monitor will supervise the installation of protective fencing/flagging and monitor at least once per week until construction is complete to ensure that the protective fencing/flagging remains intact.

Mitigation Measure BIO-10: CESA Compliance

The MCWD will comply with the CESA and obtain necessary take authorizations if sand gilia is identified in the unsurveyed portion at the Intermediate Reservoir and Ord Wellfield site during the pre-construction surveys required in **Mitigation Measure BIO-6** and it is determined that avoidance is not feasible and the project may result in take, as defined in the CESA.

The MCWD will obtain an incidental take permit from CDFW prior to take occurring at the site. Permit requirements typically involve preparation and implementation of a mitigation plan and mitigating impacted habitat at a 3:1 ratio through preservation and/or restoration. The MCWD would be required to retain a qualified biologist to prepare the mitigation plan, which will include, but is not limited to, identifying avoidance and minimization measures; mitigation strategy, including a take assessment, compensatory mitigation lands, and success criteria; and funding assurances. MCWD would be required to implement the approved mitigation plan and any additional permit requirements.

Impact BIO-2: *Substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by CDFW or USFWS.*

Maritime chaparral is the only habitat listed as sensitive on the CDFW's *California Natural Communities List* that occurs within the study area at the Existing BPS site. As described above, construction activities at the Existing BPS site would involve the relocation of a generator inside the existing building and installation of a new pipeline within the Imjin Parkway and California Avenue ROW (i.e., within existing pavement). No vegetation removal or disturbance would occur and impacts to these species would be avoided. Any future demolition and/or decommissioning activities at this site are not included as part of the proposed project. Therefore, no impacts to maritime chaparral would occur.

Impact BIO-3: *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native nursery sites.*

Wildlife movement corridors are pathways or habitat linkages that connect discrete areas of natural open space otherwise separated or fragmented by topography, changes in vegetation, and other natural or man-made factors, such as urbanization. The fragmentation of natural habitat creates isolated "islands" of vegetation that may not provide sufficient area or resources to accommodate sustainable populations for a number of species, and therefore, adversely affect both genetic and species diversity. Corridors often partially or largely mitigate the adverse effects of fragmentation by 1) allowing animals to move between remaining habitats to replenish depleted populations and increase the gene pool available; 2) providing escape routes from fire, predators, and human disturbances, thus reducing the risk that catastrophic events (e.g., fire and disease) will result in population or species extinction; and 3) serving as travel paths for

individual animals moving throughout their home range in search of food, water, mates, and other needs, or for dispersing juveniles in search of new home ranges.

The 2010 Monterey County General Plan EIR identified a number of significant wildlife movement corridors and linkages within the vicinity of the former Fort Ord, including Linkage 308: Fort Ord – Ventana; Linkage 322: Highway 68 Western Crossing; Linkage 350: Sierra de Salinas – Toro Peak; Linkage 339: Salinas Valley Floor; and Linkage 378: Salinas River – Pinnacles National Monument (County of Monterey, 2010). Of particular importance for wildlife movement from the former Fort Ord lands to outlying areas are Linkages 308 and 322. Specifically, Linkage 322 runs along El Toro Creek in the southeastern portion of former Fort Ord and through a large, bridge undercrossing Highway 68. This corridor has been identified as a significant wildlife corridor for mammals, amphibians, and reptiles moving between former Fort Ord lands and connecting to the Sierra de Salinas and Santa Lucia Ranges.

The HMP considered conservation area connectivity as an essential component of the design of the conservation areas and corridors within the former Fort Ord. The HMP created conservation areas and corridors with the purpose of linking the plant and animal populations in the northern portion of the former base at the Marina Municipal Airport to the populations in the south to the Fort Ord National Monument and the El Toro Creek undercrossing of Highway 68. The implementation of the HMP preserves over 18,500 acres of a variety of habitats supporting a variety of common and special-status plant species and maintains a north-south wildlife corridor across the former Fort Ord lands to connect with the primary, significant wildlife linkages.

The General Plan for the City of Marina and CSUMB 2007 Master Plan do not specify important wildlife corridors.

Existing BPS and Proposed B/C BPS Sites

The Existing BPS and Proposed B/C BPS sites are not located within any of the significant wildlife movement corridors or linkages identified above. These sites are located in the City of Marina, and in part within CSUMB, and are surrounded by new and remnant housing developments at California Avenue and Imjin Parkway, structures associated with CSUMB, and roadways. As such, although portions of these sites are undeveloped, these areas are currently isolated from other undeveloped areas and provide little use as a corridor for wildlife movement. The implementation of the proposed project would involve impacts to vegetation communities at these project sites; however, the proposed project would impact only a small percentage of natural habitat within the former Fort Ord. The HMP preserves approximately 18,500 acres of large, contiguous areas of wildlife habitat that will remain on the former Fort Ord and will be preserved in perpetuity. Therefore, the proposed activities within the Existing BPS and Proposed B/C BPS sites would not disconnect, fragment, or otherwise impeded wildlife movement in the primary, significant wildlife movement corridors in the area. This is a less-than-significant impact. No mitigation is required.

Intermediate Reservoir and Ord Wellfield Project Site

The Intermediate Reservoir and Ord Wellfield site is located within City's jurisdiction within an existing MCWD easement, partially surrounded by housing with existing security fencing that prevent people and large wildlife species, such as deer, from entering the site. Small wildlife that are able to pass over or through the fencing, such as birds, rodents, and reptiles, may utilize the undeveloped areas as habitat while moving through the site. The implementation of the proposed project would involve minimal impacts to

vegetation communities at the Intermediate Reservoir and Ord Wellfield Site; however, the proposed project would impact only a small percentage of wildlife habitat within the former Fort Ord. The HMP preserves approximately 18,500 acres of large, contiguous areas of wildlife habitat that will remain on the former Fort Ord and will be preserved in perpetuity. Therefore, the proposed activities within the Intermediate Reservoir and Ord Wellfield site would not disconnect, fragment, or otherwise impeded wildlife movement in the primary, significant wildlife movement corridors in the area. This is a less-than-significant impact. No mitigation is required.

Impact BIO-4: *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.*

Implementation of the project would result in impacts to trees within CSUMB campus boundaries at the Proposed BPS site; tree removal is not proposed at the other two project sites. CSUMB has established a tree restoration program for impacts to coast live oak and other trees resulting from projects that take place on campus. This program requires that for trees with a four-inch dbh or greater removed, a minimum of two coast live oak trees would be replanted in the identified restoration area on campus. The implementation of this program is required for all projects that would result in impacts to trees. Therefore, as a feature of the project design, two coast live oak trees would be replanted for every tree with a greater than four-inch dbh removed. The replanting specifications would be required in final project plans. Therefore, the potential to conflict with the CSUMB tree restoration program is less than significant. Trees within and adjacent to the project sites not planned for removal will be protected prior to and during construction through the implementation of exclusionary fencing as required in **Mitigation Measure BIO-1**.

Impact BIO-5: *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.*

The project sites are not located within an approved HCP or NCCP area. However, the project sites are located within the Fort Ord HMP boundaries and is designated for development (with no restrictions). As described in the "Approach to Analysis," the proposed project is consistent with the approved HMP. This is a less-than-significant impact and no mitigation is required.

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APPENDIX A

Special-Status Species Table

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Special-Status Species Table

Marina, Monterey, Moss Landing, Prunedale, Salinas, Seaside, and Spreckels Quadrangles

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Study Areas
MAMMALS			
Corynorhinus townsendii Townsend's big-eared bat	-- / CSC / --	Found primarily in rural settings from inland deserts to coastal redwoods, oak woodland of the inner Coast Ranges and Sierra foothills, and low to mid-elevation mixed coniferous-deciduous forests. Typically roost during the day in limestone caves, lava tubes, and mines, but can roost in buildings that offer suitable conditions. Night roosts are in more open settings and include bridges, rock crevices, and trees.	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.
Neotoma macrotis luciana Monterey dusky-footed woodrat	-- / CSC / --	Forest and oak woodland habitats of moderate canopy with moderate to dense understory. Also occurs in chaparral habitats.	**High:** No nests identified during 2019 survey efforts. However, suitable habitat is present within the Existing BPS and adjacent to Intermediate Reservoir and Wellfield study areas. Only low quality habitat is present within the Proposed BPS study area.
Sorex ornatus salarius **Monterey Ornate shrew**	-- / CSC / --	Mostly moist or riparian woodland habitats, and within chaparral, grassland, and emergent wetland habitats where there is a thick duff or downed logs.	**Moderate/High:** Suitable habitat is present within the Existing BPS study area. The CNDDB does not report any occurrences of this species; however, Figure B-18 in the HMP identifies the Intermediate Reservoir and Wellfield study area as containing potential habitat for this species and recent studies on the Fort Ord Natural Reserve have identified Monterey ornate shrew in the same habitat types on the former Fort Ord.
Taxidea taxus American badger	-- / CSC / --	Dry, open grasslands, fields, pastures savannas, and mountain meadows near timberline are preferred. The principal requirements seem to be sufficient food, friable soils, and relatively open, uncultivated grounds.	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.
BIRDS			
Agelaius tricolor Tricolored blackbird (nesting colony)	-- / ST / --	Nest in colonies in dense riparian vegetation, along rivers, lagoons, lakes, and ponds. Forages over grassland or aquatic habitats.	**Unlikely:** No suitable nesting habitat is present within or adjacent to the study areas.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Study Areas
Asio flammeus Short-eared owl (nesting)	-- / CSC / --	Usually found in open areas with few trees, such as annual and perennial grasslands, prairies, meadows, dunes, irrigated lands, and saline and freshwater emergent marshes. Dense vegetation is required for roosting and nesting cover. This includes tall grasses, brush, ditches, and wetlands. Open, treeless areas containing elevated sites for perching, such as fence posts or small mounds, are also needed. Some individuals breed in northern California.	**Unlikely:** No suitable nesting habitat is present within or adjacent to the study areas.
Athene cunicularia Burrowing owl (burrow sites & some wintering sites)	-- / CSC / --	Year-round resident of open, dry grassland and desert habitats, and in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats. Frequent open grasslands and shrublands with perches and burrows. Use rodent burrows (often California ground squirrel) for roosting and nesting cover. Pipes, culverts, and nest boxes may be substituted for burrows in areas where burrows are not available.	**Low:** Poor quality habitat is present within the Existing BPS study areas within some portions of the ruderal areas. The nearest CNDDB occurrence is an unspecified location adjacent to the existing BPS study area. This species has also been observed by DD&A biologists 5.6 km north of the study areas.
Charadrius alexandrinus nivosus Western snowy plover	FT / CSC / --	Sandy beaches on marine and estuarine shores, also salt pond levees and the shores of large alkali lakes. Requires sandy, gravelly or friable soil substrate for nesting.	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.
Coturnicops noveboracensis Yellow rail	-- / CSC / --	Wet meadows and coastal tidal marshes. Occurs year round in California, but in two primary seasonal roles: as a very local breeder in the northeastern interior and as a winter visitor (early Oct to mid-Apr) on the coast and in the Suisun Marsh region	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.
Cypseloides niger Black swift	-- / CSC / --	Regularly nests in moist crevice or cave on sea cliffs above the surf, or on cliffs behind, or adjacent to, waterfalls in deep canyons. Forages widely over many habitats.	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.
Elanus leucurus White-tailed kite (nesting)	-- / CFP / --	Open groves, river valleys, marshes, and grasslands. Prefer such area with low roosts (fences etc.). Nest in shrubs and trees adjacent to grasslands.	**High:** Suitable nesting and foraging habitat present within all study areas. The nearest CNDDB occurrence is 17 km north of the study areas; however, this species has also been observed by DD&A biologists approximately 0.8 km east of the Existing BPS study area.
Falco peregrinus anatum American peregrine falcon (nesting)	-- / CFP / --	Forages for other birds over a variety of habitats. Breeds primarily on rocky cliffs.	**Low:** Although this species may forage within the study areas, no suitable nesting habitat is present.
Laterallus jamaicensis coturniculus California black rail	-- / ST&CFP / --	Inhabits freshwater marshes, wet meadows & shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that does not fluctuate during the year & dense vegetation for nesting habitat.	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Study Areas
Pelecanus occidentalis californicus California brown pelican	-- / CFP / --	Found in estuarine, marine subtidal, and marine pelagic waters along the California coast. Usually rests on water or inaccessible rocks, but also uses mudflats, sandy beaches, wharfs, and jetties.	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.
Rallus obsoletus obsoletus California Ridgway's rail	FE / SE&CFP / --	Salt and brackish marshes.	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.
Riparia riparia Bank swallow (nesting)	-- / ST / --	Nest colonially in sand banks. Found near water; fields, marshes, streams, and lakes.	**Unlikely:** No suitable nesting habitat is present within or adjacent to the study areas.
REPTILES AND AMPHIBIANS			
Ambystoma californiense **California tiger salamander**	FT / ST /--	Annual grassland and grassy understory of valley-foothill hardwood habitats in central and northern California. Need underground refuges and vernal pools or other seasonal water sources.	**Moderate:** No aquatic breeding habitat is present within the study areas; however, potential upland habitat (i.e. suitable habitat within 2.2 km of known and potential breeding ponds) is present within the Intermediate Reservoir and Wellfield study area. The nearest CNDDB occurrence is 0.25 km south of the Intermediate Reservoir and Wellfield study area.
Ambystoma macrodactylum croceum Santa Cruz long-toed salamander	FE / SE&CFP /--	Preferred habitats include ponderosa pine, montane hardwood-conifer, mixed conifer, montane riparian, red fir and wet meadows. Occurs in a small number of localities in Santa Cruz and Monterey Counties. Adults spend the majority of the time in underground burrows and beneath objects. Larvae prefer shallow water with clumps of vegetation.	**Unlikely:** The study areas are outside of the known range for this species.
Anniella pulchra **Northern California legless lizard**	-- / CSC / --	Requires moist, warm habitats with loose soil for burrowing and prostrate plant cover, often forages in leaf litter at plant bases; may be found on beaches, sandy washes, and in woodland, chaparral, and riparian areas.	**High:** Suitable habitat is present within all study areas. The CNDDB reports occurrence directly adjacent to the Proposed BPS study area and the Intermediate Reservoir and Wellfield study area.
Emys marmorata Western pond turtle	-- / CSC / --	Associated with permanent or nearly permanent water in a wide variety of habitats including streams, lakes, ponds, irrigation ditches, etc. Require basking sites such as partially submerged logs, rocks, mats of vegetation, or open banks.	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.
Phrynosoma blainvillii Coast horned lizard	-- / CSC / --	Associated with open patches of sandy soils in washes, chaparral, scrub, and grasslands.	**Moderate:** Suitable habitat is present within the coastal scrub, maritime chaparral, and ruderal habitats within all study areas. This species is known to occur and has been observed by DD&A biologists throughout Fort Ord and Marina. The nearest CNDDB occurrence is 0.4 km from the Intermediate Reservoir and Wellfield study area.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Study Areas
Rana boylii Foothill yellow-legged frog	-- / SC&CSC / --	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats, including hardwood, pine, and riparian forests, scrub, chaparral, and wet meadows. Rarely encountered far from permanent water.	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.
Rana draytonii **California red-legged frog**	FT / CSC / --	Lowlands and foothills in or near permanent or late-season sources of deep water with dense, shrubby, or emergent riparian vegetation. During late summer or fall adults are known to utilize a variety of upland habitats with leaf litter or mammal burrows.	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.
Spea hammondii Western spadefoot	-- / CSC / --	Grasslands with shallow temporary pools are optimal habitats for the western spadefoot. Occur primarily in grassland habitats, but can be found in valley and foothill woodlands. Vernal pools are essential for breeding and egg laying.	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.
Taricha torosa Coast Range newt	-- / CSC / --	Occurs mainly in valley-foothill hardwood, valley-foothill hardwood-conifer, coastal scrub, and mixed chaparral but is known to occur in grasslands and mixed conifer types. Seek cover under rocks and logs, in mammal burrows, rock fissures, or man-made structures such as wells. Breed in intermittent ponds, streams, lakes, and reservoirs.	**Moderate:** No suitable breeding habitat with the study areas; however, suitable upland habitat is present within all study areas. The nearest CNDDB occurrence is approximately 8.2 km east of the Intermediate Reservoir and Wellfield study area.
Thamnophis hammondii Two-striped garter snake	-- / CSC / --	Associated with permanent or semi-permanent bodies of water bordered by dense vegetation in a variety of habitats from sea level to 2400m elevation.	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.
FISH			
Eucyclogobius newberryi Tidewater goby	FE / CSC / --	Brackish water habitats; found in shallow lagoons and lower stream reaches. Tidewater gobies appear to be naturally absent (now and historically) from three large stretches of coastline where lagoons or estuaries are absent and steep topography or swift currents may prevent tidewater gobies from dispersing between adjacent localities. The southernmost large, natural gap occurs between the Salinas River in Monterey County and Arroyo del Oso in San Luis Obispo County.	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.
Oncorhynchus mykiss irideus Steelhead (south-central California coast DPS)	FT / -- / --	Cold headwaters, creeks, and small to large rivers and lakes; anadromous in coastal streams.	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.
Spirinchus thaleichthys Longfin smelt	FC / ST / --	Euryhaline, nektonic & anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefers salinities of 15-30 PPT, but can be found in completely freshwater to almost pure seawater.	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Study Areas
INVERTEBRATES			
Bombus occidentalis Western bumble bee	-- / SC / --	Occurs in open grassy areas, urban parks and gardens, chaparral and shrub areas, and mountain meadows. Requires plants that bloom and provide adequate nectar and pollen throughout the colony's life cycle, which is from early February to late November. Generally nests underground, often in abandoned mammal burrows. Populations are currently largely restricted to high elevation sites in the Sierra Nevada; however, the historic range includes the northern California coast.	**Low:** Small mammal burrows are present within all study areas that could support nests of this species. However, it is likely the study areas do not provide adequate nectar and pollen throughout the life cycle of this species' colony.
***Euphilotes enoptes smithi* Smith's blue butterfly**	FE / -- / --	Most commonly associated with coastal dunes and coastal sage scrub plant communities in Monterey and Santa Cruz Counties. Plant hosts are *Eriogonum latifolium* and *E. parvifolium*.	**Unlikely:** Obligate host plant species (i.e. *Eriogonum parvifolium* and *E. latifolium*) not identified during 2019 surveys.
***Linderiella occidentalis* California linderiella (fairy shrimp)**	-- / CNDDB / --	Ephemeral ponds with no flow. Generally associated with hardpans.	**Unlikely:** No suitable habitat is present within or adjacent to the study areas.
PLANTS			
Agrostis lacuna-vernalis Vernal pool bent grass	-- / -- / 1B	Vernal pool Mima mounds at elevations of 115-145 meters. Annual herb in the Poaceae family; blooms April-May. Known only from Butterfly Valley and Machine Gun Flats of Ft. Ord National Monument.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Allium hickmanii Hickman's onion	-- / -- / 1B	Closed-cone coniferous forests, maritime chaparral, coastal prairie, coastal scrub, and valley and foothill grasslands at elevations of 5-200 meters. Bulbiferous perennial herb in the Alliaceae family; blooms March-May.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
***Arctostaphylos hookeri* ssp. *hookeri* Hooker's manzanita**	-- / -- / 1B	Closed-cone coniferous forest, chaparral, cismontane woodland, and coastal scrub on sandy soils at elevations of 85-536 meters. Evergreen shrub in the Ericaceae family; blooms January-June.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
***Arctostaphylos montereyensis* Toro manzanita**	-- / -- / 1B	Maritime chaparral, cismontane woodland, and coastal scrub on sandy soils at elevations of 30-730 meters. Evergreen shrub in the Ericaceae family; blooms February-March.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Arctostaphylos pajaroensis Pajaro manzanita	-- / -- / 1B	Chaparral on sandy soils at elevations of 30-760 meters. Evergreen shrub in the Ericaceae family; blooms December-March.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Study Areas
Arctostaphylos pumila **Sandmat manzanita**	-- / -- / 1B	Openings of closed-cone coniferous forests, maritime chaparral, cismontane woodland, coastal dunes, and coastal scrub on sandy soils at elevations of 3-205 meters. Evergreen shrub in the Ericaceae family; blooms February-May.	**Present:** Identified within the Existing BPS study area during the 2019 survey efforts. Also identified adjacent to the Existing and Proposed BPS study areas during the 2019 survey effort. **Moderate:** Suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Astragalus tener var. *tener* Alkali milk-vetch	-- / -- / 1B	Playas, valley and foothill grassland on adobe clay, and vernal pools on alkaline soils at elevations of 1-60 meters. Annual herb in the Fabaceae family; blooms March-June.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Astragalus tener var. *titi* Coastal dunes milk-vetch	FE / SE / 1B	Sandy soils in coastal bluff scrub, coastal dunes, coastal prairie (mesic); elevation 3-164 feet. Annual herb in the Fabaceae family; blooms March-May.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Castilleja ambigua var. insalutata Pink Johnny-nip	-- / -- / 1B	Coastal prairie and coastal scrub at elevations of 0-100 meters. Annual herb in the Orobanchaceae family; blooms May-August.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Ceanothus cuneatus **ssp. *rigidus*** **Monterey ceanothus**	-- / -- / 4	Closed cone coniferous forest, chaparral, and coastal scrub on sandy soils at elevations of 3-550 meters. Evergreen shrub in the Rhamnaceae family, blooms February-June.	**Present:** Identified within the Existing BPS study area and adjacent to the Proposed BPS study area during the 2019 survey effort. **Unlikely:** No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Centromadia parryi ssp. *congdonii* Congdon's tarplant	-- / -- / 1B	Valley and foothill grassland on heavy clay, saline, or alkaline soils at elevations of 0-230 meters. Annual herb in the Asteraceae family; blooms May-November.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Chorizanthe minutiflora Fort Ord spineflower	-- / -- / 1B	Sandy openings of maritime chaparral and coastal scrub at elevations of 55-150 meters. Only known occurrences on Fort Ord National Monument. Annual herb in the Polygonaceae family; blooms April-July.	**Moderate:** Not identified within any of the study areas during the 2019 survey effort; however suitable habitat is present within the unsurveyed area of the Intermediate Reservoir and Wellfield study area. The nearest CNDDB occurrence is approximately 2.5 km from the study areas.
Chorizanthe pungens **var. *pungens*** **Monterey spineflower**	FT / -- / 1B	Maritime chaparral, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland on sandy soils at elevations of 3-450 meters. Annual herb in the Polygonaceae family; blooms April-July.	**Present:** Identified within and adjacent to the Intermediate Reservoir and Wellfield study area during the 2019 survey effort. Also identified adjacent to the Existing and Proposed BPS study areas during the 2019 survey effort. **Moderate:** Suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Study Areas
Chorizanthe robusta var. *robusta* Robust spineflower	FE / -- / 1B	Openings in cismontane woodland, coastal dunes, maritime chaparral, and coastal scrub on sandy or gravelly soils at elevations of 3-300 meters. Annual herb in the Polygonaceae family; blooms April-September.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. The study areas are likely outside of the known range for this species. No CNDDB occurrences within the evaluated quadrangles.
Clarkia jolonensis Jolon clarkia	-- / -- / 1B	Cismontane woodland, chaparral, riparian woodland, and coastal scrub at elevations of 20-660 meters. Annual herb in the Onagraceae family; blooms April-June.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Collinsia multicolor San Francisco collinsia	-- / -- / 1B	Closed-cone coniferous forest and coastal scrub, sometimes on serpentinite soils, at elevations of 30-250 meters. Annual herb in the Plantaginaceae family; blooms March-May.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Cordylanthus rigidus* ssp. *littoralis **Seaside bird's-beak**	-- / SE / 1B	Closed-cone coniferous forests, maritime chaparral, cismontane woodlands, coastal dunes, and coastal scrub on sandy soils, often on disturbed sites, at elevations of 0-425 meters. Annual hemi-parasitic herb in the Orobanchaceae family; blooms April-October.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Delphinium californicum ssp. *interius* Hospital Canyon larkspur	-- / -- / 1B	Openings in chaparral, coastal scrub, and mesic areas of cismontane woodland at elevations of 230-1095 meters. Perennial herb in the Ranunculaceae family; blooms April-June.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area. Study areas are out of elevation range for this species.
Delphinium hutchinsoniae Hutchinson's larkspur	-- / -- / 1B	Broadleaved upland forest, chaparral, coastal scrub, and coastal prairie at elevations of 0-427 meters. Perennial herb in the Ranunculaceae family; blooms March-June.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Delphinium umbraculorum Umbrella larkspur	-- / -- / 1B	Cismontane woodland at elevations of 400-1600 meters. Perennial herb in the Ranunculaceae family; blooms April-June.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Ericameria fasciculata **Eastwood's goldenbush**	-- / -- / 1B	Openings in closed-cone coniferous forest, maritime chaparral, coastal dunes, and coastal scrub on sandy soils at elevations of 30-275 meters. Evergreen shrub in the Asteraceae family; blooms July-October.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Eriogonum nortonii Pinnacles buckwheat	-- / -- / 1B	Chaparral and valley and foothill grassland on sandy soils, often on recent burns, at elevations of 300-975 meters. Annual herb in the Polygonaceae family; blooms May-September.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area. Study areas are out of elevation range for this species.
Erysimum ammophilum **Sand-loving wallflower**	-- / -- / 1B	Openings in maritime chaparral, coastal dunes, and coastal scrub on sandy soils at elevations of 0-60 meters. Perennial herb in the Brassicaceae family; blooms February-June.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Study Areas
Erysimum menziesii Menzies' wallflower	FE / SE / 1B	Coastal dunes at elevations of 0-35 meters. Perennial herb in the Brassicaceae family; blooms March-September.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Fritillaria liliacea Fragrant fritillary	-- / -- / 1B	Cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland, often serpentinite, at elevations of 3-410 meters. Bulbiferous perennial herb in the Liliaceae family; blooms February-April.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Gilia tenuiflora* ssp. *arenaria **Sand gilia**	FE / ST / 1B	Openings in maritime chaparral, cismontane woodland, coastal dunes, and coastal scrub on sandy soils at elevations of 0-45 meters. Annual herb in the Polemoniaceae family; blooms April-June.	**Present:** Identified within the Existing BPS study area during the 2019 survey efforts. **Moderate:** Suitable habitat is present within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Hesperocyparis goveniana Gowen cypress	FT / -- / 1B	Closed-cone coniferous forest and maritime chaparral at elevations of 30-300 meters. Evergreen tree in the Cupressaceae family. Natively occurring only at Point Lobos near Gibson Creek and the Huckleberry Hill Nature Preserve near Highway 68.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Hesperocyparis macrocarpa Monterey cypress	-- / -- / 1B	Closed-cone coniferous forest at elevations of 10-30 meters. Evergreen tree in the Cupressaceae family. Natively occurring only at Cypress Point in Pebble Beach and Point Lobos State Park; widely planted and naturalized elsewhere.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Holocarpha macradenia Santa Cruz tarplant	FT / SE / 1B	Coastal prairies and valley foothill grasslands, often clay or sandy soils, at elevations of 10-220 meters. Annual herb in the Asteraceae family; blooms June-October.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Horkelia cuneata ssp. *sericea* Kellogg's horkelia	-- / -- / 1B	Openings of closed-cone coniferous forests, maritime chaparral, coastal dunes, and coastal scrub on sandy or gravelly soils at elevations of 10-200 meters. Perennial herb in the Rosaceae family; blooms April-September.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Horkelia marinensis Point Reyes horkelia	-- / -- / 1B	Coastal dunes, coastal prairie, and coastal scrub on sandy soils at elevations of 5-350 meters. Perennial herb in the Rosaceae family; blooms May-September.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Lasthenia conjugens Contra Costa goldfields	FE / -- / 1B	Mesic areas of valley and foothill grassland, alkaline playas, cismontane woodland, and vernal pools at elevations of 0-470 meters. Annual herb in the Asteraceae family; blooms March-June.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Layia carnosa Beach layia	FE / SE / 1B	Coastal dunes and coastal scrub on sandy soils at elevations of 0-60 meters. Annual herb in the Asteraceae family; blooms March-July.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Study Areas
Legenere limosa Legenere	-- / -- / 1B	Vernal pools and wetlands at elevations of 1-880 meters. Annual herb in the Campanulaceae family; blooms April- June.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Lupinus tidestromii Tidestrom's lupine	FE / SE / 1B	Coastal dunes at elevations of 0-100 meters. Perennial rhizomatous herb in the Fabaceae family; blooms April-June.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Malacothamnus palmeri var. *involucratus* Carmel Valley bush-mallow	-- / -- / 1B	Chaparral, cismontane woodland, and coastal scrub at elevations of 30-1100 meters. Perennial deciduous shrub in the Malvaceae family; blooms May-October.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Malacothrix saxatilis var. *arachnoidea* Carmel Valley malacothrix	-- / -- / 1B	Chaparral and coastal scrub on rocky soils at elevations of 25-1036 meters. Perennial rhizomatous herb in the Asteraceae family; blooms June-December.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Meconella oregana Oregon meconella	-- / -- / 1B	Coastal prairie and coastal scrub at elevations of 250-620 meters. Annual herb in the Papaveraceae Family; blooms March-April.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Microseris paludosa Marsh microseris	-- / -- / 1B	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland at elevations of 5-300 meters. Perennial herb in the Asteraceae family; blooms April-July.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Monardella sinuata ssp. *nigrescens* Northern curly-leaved monardella	-- / -- / 1B	Chaparral, coastal dunes, coastal scrub, and lower montane coniferous forest (ponderosa pine sandhills) on sandy soils at elevations of 0-300 meters. Annual herb in the Lamiaceae family; blooms April-September.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Monolopia gracilens Woodland wollythreads	-- / -- / 1B	Openings of broadleaved upland forest, chaparral, cismontane woodland, North Coast coniferous forest, and valley and foothill grassland on serpentinite soils at elevations of 100-1200 meters. Annual herb in the Asteraceae family; blooms February-July.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Pinus radiata Monterey pine	-- / -- / 1B	Closed-cone coniferous forest and cismontane woodland at elevations of 25-185 meters. Evergreen tree in the Pinaceae family. Only three native stands in CA at Año Nuevo, Cambria, and the Monterey Peninsula; introduced in many areas.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Piperia yadonii **Yadon's rein orchid**	FE / -- / 1B	Sandy soils in coastal bluff scrub, closed-cone coniferous forest, and maritime chaparral at elevations of 10-510 meters. Annual herb in the Orchidaceae family; blooms February-August.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Study Areas
Plagiobothrys chorisianus var. *chorisianus* Choris' popcorn-flower	-- / -- / 1B	Mesic areas of chaparral, coastal prairie, and coastal scrub at elevations of 15-160 meters. Annual herb in the Boraginaceae family; blooms March-June.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Potentilla hickmanii Hickman's cinquefoil	FE / SE / 1B	Coastal bluff scrub, closed-cone coniferous forests, vernally mesic meadows and seeps, and freshwater marshes and swamps at elevations of 10-149 meters. Perennial herb in the Rosaceae family; blooms April-August.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Ramalina thrausta Angel's hair lichen	-- / -- / 2B	North coast coniferous forest on dead twigs and other lichens. Epiphytic fructose lichen in the Ramalinaceae family. In northern CA it is usually found on dead twigs, and has been found on *Alnus rubra*, *Calocedrus decurrens*, *Pseudotsuga menziesii*, *Quercus garryana*, and *Rubus spectabilis*. In Sonoma County it grows on and among dangling mats of *R. menziesii* and *Usnea* spp.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Rosa pinetorum Pine rose	-- / -- / 1B	Closed-cone coniferous forest at elevations of 2-300 meters. Perennial shrub in the Rosaceae family; blooms May-July. Possible hybrid of *R. spithamea*, *R. gymnocarpa*, or others; further study needed.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Sidalcea malachroides Maple-leaved checkerbloom	-- / -- / 4	Broadleaved upland forest, coastal prairie, coastal scrub, North Coast coniferous forest, and riparian woodlands, often in disturbed areas, at elevations of 2-730 meters. Perennial herb in the Malvaceae family; blooms March-August.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Stebbinsoseris decipiens Santa Cruz microseris	-- / -- / 1B	Broadleaved upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, and openings in valley and foothill grassland, sometimes on serpentinite, at elevations of 10-500 meters. Annual herb in the Asteraceae family; blooms April-May.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Trifolium buckwestiorum Santa Cruz clover	-- / -- / 1B	Gravelly margins of broadleaved upland forest, cismontane woodland, and coastal prairie at elevations of 105-610 meters. Annual herb in the Fabaceae family; blooms April-October.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Trifolium hydrophilum Saline clover	-- / -- / 1B	Marshes and swamps, mesic and alkaline valley and foothill grassland, and vernal pools at elevations of 0-300 meters. Annual herb in the Fabaceae family; blooms April-June.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.
Trifolium polyodon Pacific Grove clover	-- / SR / 1B	Mesic areas of closed-cone coniferous forest, coastal prairie, meadows and seeps, and valley and foothill grassland at elevations of 5-120 meters. Annual herb in the Fabaceae family; blooms April-July.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Study Areas
Trifolium trichocalyx Monterey clover	FE / SE / 1B	Sandy openings and burned areas of closed-cone coniferous forest at elevations of 30-240 meters. Annual herb in the Fabaceae family; blooms April-June.	**Unlikely:** Not identified within any study areas during the 2019 survey effort. No suitable habitat within the unsurveyed area of the Intermediate Reservoir and Wellfield study area.

STATUS DEFINITIONS

Federal

FE = listed as Endangered under the federal Endangered Species Act
FT = listed as Threatened under the federal Endangered Species Act
FC = Candidate for listing under the federal Endangered Species Act
-- = no listing

State

SE = listed as Endangered under the California Endangered Species Act
ST = listed as Threatened under the California Endangered Species Act
SC = Candidate for listing under California Endangered Species Act
SR = listed as Rare under the California Native Plant Protection Act
CFP = California Fully Protected Species
CSC = CDFW Species of Special Concern
CNDDB = This designation is being assigned to animal species with no other status designation defined in this table. These animal species are included in the Department's CNDDB "Special Animals" list (2019), which includes all taxa the CNDDB is interested in tracking, regardless of their legal or protection status.
-- = no listing

California Native Plant Society

1B = California Rare Plant Rank 1B species; plants rare, threatened, or endangered in California and elsewhere
2B = California Rare Plant Rank 2B species; rare, threatened, or endangered in California, but more common elsewhere
4 = California Rare Plant Rank 4 Limited distribution (CNPS Watch List)
-- = no listing

***Bold font indicates Fort Ord HMP Species**

POTENTIAL TO OCCUR

Present = known occurrence of species within the site; presence of suitable habitat conditions; or identified during field surveys
High = known occurrence of species in the vicinity from the CNDDB or other documentation; presence of suitable habitat conditions
Moderate = known occurrence of species in the vicinity from the CNDDB or other documentation; presence of marginal habitat conditions within the site
Low = species known to occur in the vicinity from the CNDDB or other documentation; lack of suitable habitat or poor quality
Unlikely = species not known to occur in the vicinity from the CNDDB or other documentation, no suitable habitat is present within the site
Not Present = species was not identified during surveys

APPENDIX B

Site Plan

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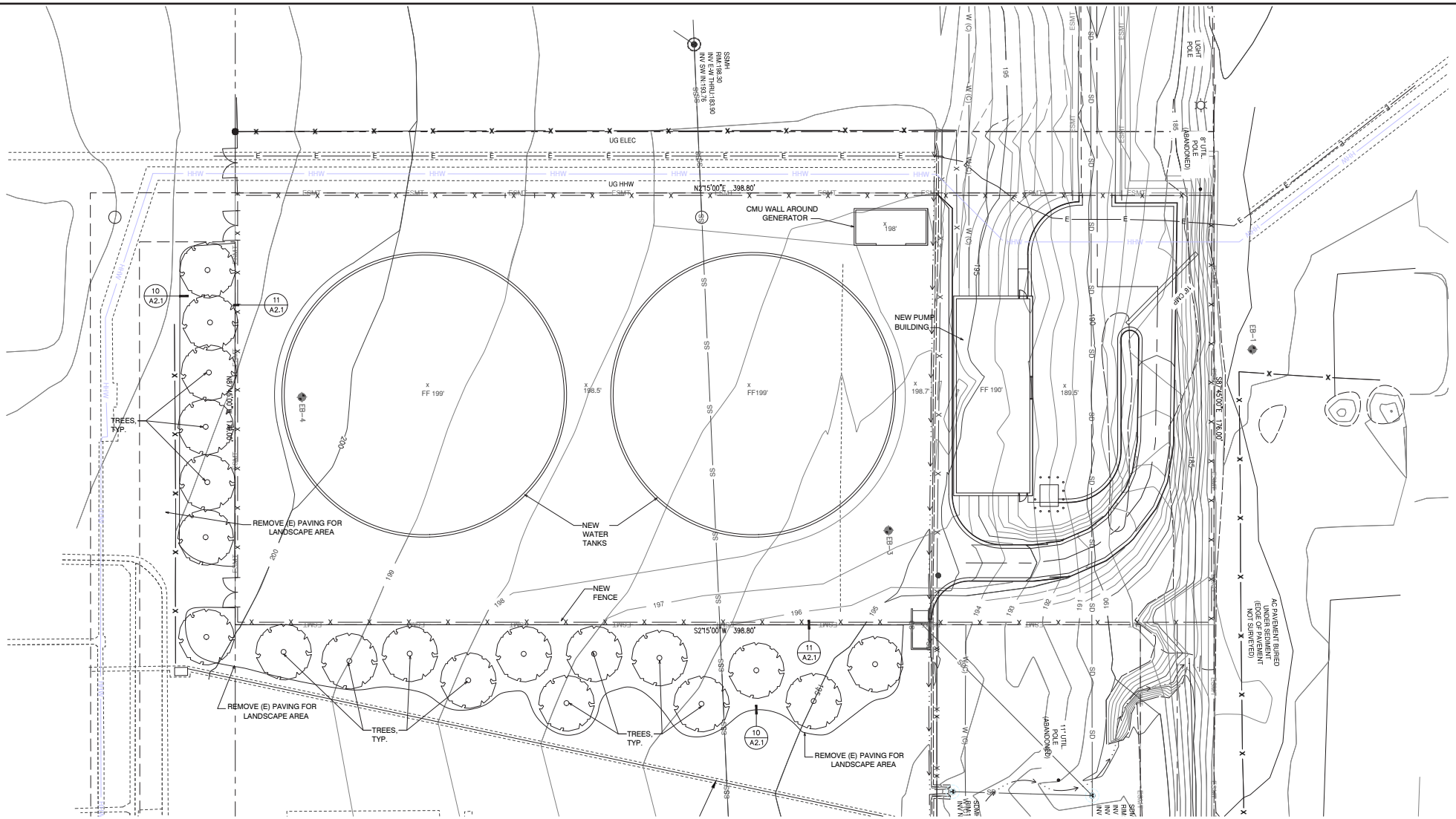

Source: The Paul Davis Partnership, LLP, May 2020

Title: **Proposed BPS and Reservoirs Site Plan**	Date 9/10/2020 Scale 1"=20' Project 2019.20	Monterey | San Jose **Denise Duffy and Associates, Inc.** Environmental Consultants Resource Planners 947 Cass Street, Suite 5 Monterey, CA 93940 (831) 373-4341	Appendix **B**

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APPENDIX C

California Natural Diversity Database Report

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Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Moss Landing (3612177) OR Prunedale (3612176) OR Marina (3612167) OR Salinas (3612166) OR Monterey (3612158) OR Seaside (3612157) OR Spreckels (3612156))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G2G3	S1S2	SSC
Agrostis lacuna-vernalis vernal pool bent grass	PMPOA041N0	None	None	G1	S1	1B.1
Allium hickmanii Hickman's onion	PMLIL02140	None	None	G2	S2	1B.2
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
Ambystoma macrodactylum croceum Santa Cruz long-toed salamander	AAAAA01082	Endangered	Endangered	G5T1T2	S1S2	FP
Anniella pulchra northern California legless lizard	ARACC01020	None	None	G3	S3	SSC
Arctostaphylos hookeri ssp. hookeri Hooker's manzanita	PDERI040J1	None	None	G3T2	S2	1B.2
Arctostaphylos montereyensis Toro manzanita	PDERI040R0	None	None	G2?	S2?	1B.2
Arctostaphylos pajaroensis Pajaro manzanita	PDERI04100	None	None	G1	S1	1B.1
Arctostaphylos pumila sandmat manzanita	PDERI04180	None	None	G1	S1	1B.2
Asio flammeus short-eared owl	ABNSB13040	None	None	G5	S3	SSC
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T1	S1	1B.2
Astragalus tener var. titi coastal dunes milk-vetch	PDFAB0F8R2	Endangered	Endangered	G2T1	S1	1B.1
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Bryoria spiralifera twisted horsehair lichen	NLTEST5460	None	None	G1G2	S1S2	1B.1
Buteo regalis ferruginous hawk	ABNKC19120	None	None	G4	S3S4	WL
Castilleja ambigua var. insalutata pink Johnny-nip	PDSCR0D403	None	None	G4T2	S2	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Central Dune Scrub Central Dune Scrub	CTT21320CA	None	None	G2	S2.2	
Central Maritime Chaparral Central Maritime Chaparral	CTT37C20CA	None	None	G2	S2.2	
Centromadia parryi ssp. congdonii Congdon's tarplant	PDAST4R0P1	None	None	G3T1T2	S1S2	1B.1
Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2S3	SSC
Chorizanthe minutiflora Fort Ord spineflower	PDPGN04100	None	None	G1	S1	1B.2
Chorizanthe pungens var. pungens Monterey spineflower	PDPGN040M2	Threatened	None	G2T2	S2	1B.2
Chorizanthe robusta var. robusta robust spineflower	PDPGN040Q2	Endangered	None	G2T1	S1	1B.1
Clarkia jolonensis Jolon clarkia	PDONA050L0	None	None	G2	S2	1B.2
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coastal Brackish Marsh Coastal Brackish Marsh	CTT52200CA	None	None	G2	S2.1	
Coelus globosus globose dune beetle	IICOL4A010	None	None	G1G2	S1S2	
Collinsia multicolor San Francisco collinsia	PDSCR0H0B0	None	None	G2	S2	1B.2
Cordylanthus rigidus ssp. littoralis seaside bird's-beak	PDSCR0J0P2	None	Endangered	G5T2	S2	1B.1
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Coturnicops noveboracensis yellow rail	ABNME01010	None	None	G4	S1S2	SSC
Cypseloides niger black swift	ABNUA01010	None	None	G4	S2	SSC
Danaus plexippus pop. 1 monarch - California overwintering population	IILEPP2012	None	None	G4T2T3	S2S3	
Delphinium californicum ssp. interius Hospital Canyon larkspur	PDRAN0B0A2	None	None	G3T3	S3	1B.2
Delphinium hutchinsoniae Hutchinson's larkspur	PDRAN0B0V0	None	None	G2	S2	1B.2
Delphinium umbraculorum umbrella larkspur	PDRAN0B1W0	None	None	G3	S3	1B.3
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Eremophila alpestris actia California horned lark	ABPAT02011	None	None	G5T4Q	S4	WL
Ericameria fasciculata Eastwood's goldenbush	PDAST3L080	None	None	G2	S2	1B.1
Eriogonum nortonii Pinnacles buckwheat	PDPGN08470	None	None	G2	S2	1B.3
Erysimum ammophilum sand-loving wallflower	PDBRA16010	None	None	G2	S2	1B.2
Erysimum menziesii Menzies' wallflower	PDBRA160R0	Endangered	Endangered	G1	S1	1B.1
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S3	SSC
Euphilotes enoptes smithi Smith's blue butterfly	IILEPG2026	Endangered	None	G5T1T2	S1S2	
Falco mexicanus prairie falcon	ABNKD06090	None	None	G5	S4	WL
Falco peregrinus anatum American peregrine falcon	ABNKD06071	Delisted	Delisted	G4T4	S3S4	FP
Fritillaria liliacea fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2
Gilia tenuiflora ssp. arenaria Monterey gilia	PDPLM041P2	Endangered	Threatened	G3G4T2	S2	1B.2
Hesperocyparis goveniana Gowen cypress	PGCUP04031	Threatened	None	G1	S1	1B.2
Hesperocyparis macrocarpa Monterey cypress	PGCUP04060	None	None	G1	S1	1B.2
Holocarpha macradenia Santa Cruz tarplant	PDAST4X020	Threatened	Endangered	G1	S1	1B.1
Horkelia cuneata var. sericea Kellogg's horkelia	PDROS0W043	None	None	G4T1?	S1?	1B.1
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Lasthenia conjugens Contra Costa goldfields	PDAST5L040	Endangered	None	G1	S1	1B.1
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G3G4T1	S1	FP
Layia carnosa beach layia	PDAST5N010	Endangered	Endangered	G2	S2	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Legenere limosa legenere	PDCAM0C010	None	None	G2	S2	1B.1
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Lupinus tidestromii Tidestrom's lupine	PDFAB2B3Y0	Endangered	Endangered	G1	S1	1B.1
Malacothamnus palmeri var. involucratus Carmel Valley bush-mallow	PDMAL0Q0B1	None	None	G3T2Q	S2	1B.2
Malacothrix saxatilis var. arachnoidea Carmel Valley malacothrix	PDAST660C2	None	None	G5T2	S2	1B.2
Meconella oregana Oregon meconella	PDPAP0G030	None	None	G2G3	S2	1B.1
Microseris paludosa marsh microseris	PDAST6E0D0	None	None	G2	S2	1B.2
Monardella sinuata ssp. nigrescens northern curly-leaved monardella	PDLAM18162	None	None	G3T2	S2	1B.2
Monolopia gracilens woodland woollythreads	PDAST6G010	None	None	G3	S3	1B.2
Monterey Cypress Forest Monterey Cypress Forest	CTT83150CA	None	None	G1	S1.2	
Monterey Pine Forest Monterey Pine Forest	CTT83130CA	None	None	G1	S1.1	
Monterey Pygmy Cypress Forest Monterey Pygmy Cypress Forest	CTT83162CA	None	None	G1	S1.1	
Neotoma macrotis luciana Monterey dusky-footed woodrat	AMAFF08083	None	None	G5T3	S3	SSC
Northern Bishop Pine Forest Northern Bishop Pine Forest	CTT83121CA	None	None	G2	S2.2	
Northern Coastal Salt Marsh Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
Oncorhynchus mykiss irideus pop. 9 steelhead - south-central California coast DPS	AFCHA0209H	Threatened	None	G5T2Q	S2	
Pelecanus occidentalis californicus California brown pelican	ABNFC01021	Delisted	Delisted	G4T3T4	S3	FP
Phrynosoma blainvillii coast horned lizard	ARACF12100	None	None	G3G4	S3S4	SSC
Pinus radiata Monterey pine	PGPIN040V0	None	None	G1	S1	1B.1
Piperia yadonii Yadon's rein orchid	PMORC1X070	Endangered	None	G1	S1	1B.1
Plagiobothrys chorisianus var. chorisianus Choris' popcornflower	PDBOR0V061	None	None	G3T1Q	S1	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Potentilla hickmanii Hickman's cinquefoil	PDROS1B0U0	Endangered	Endangered	G1	S1	1B.1
Rallus obsoletus obsoletus California Ridgway's rail	ABNME05011	Endangered	Endangered	G5T1	S1	FP
Ramalina thrausta angel's hair lichen	NLLEC3S340	None	None	G5?	S2S3	2B.1
Rana boylii foothill yellow-legged frog	AAABH01050	None	Candidate Threatened	G3	S3	SSC
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Reithrodontomys megalotis distichlis Salinas harvest mouse	AMAFF02032	None	None	G5T1	S1	
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2	
Rosa pinetorum pine rose	PDROS1J0W0	None	None	G2	S2	1B.2
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Sorex ornatus salarius Monterey shrew	AMABA01105	None	None	G5T1T2	S1S2	SSC
Spea hammondii western spadefoot	AAABF02020	None	None	G3	S3	SSC
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	
Stebbinsoseris decipiens Santa Cruz microseris	PDAST6E050	None	None	G2	S2	1B.2
Taricha torosa Coast Range newt	AAAAF02032	None	None	G4	S4	SSC
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thamnophis hammondii two-striped gartersnake	ARADB36160	None	None	G4	S3S4	SSC
Trifolium buckwestiorum Santa Cruz clover	PDFAB402W0	None	None	G2	S2	1B.1
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Trifolium polyodon Pacific Grove clover	PDFAB402H0	None	Rare	G1	S1	1B.1
Trifolium trichocalyx Monterey clover	PDFAB402J0	Endangered	Endangered	G1	S1	1B.1
Tryonia imitator mimic tryonia (=California brackishwater snail)	IMGASJ7040	None	None	G2	S2	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Valley Needlegrass Grassland	CTT42110CA	None	None	G3	S3.1	
Valley Needlegrass Grassland						

Record Count: 104

APPENDIX D

IPaC Resource List

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IPaC **U.S. Fish & Wildlife Service**

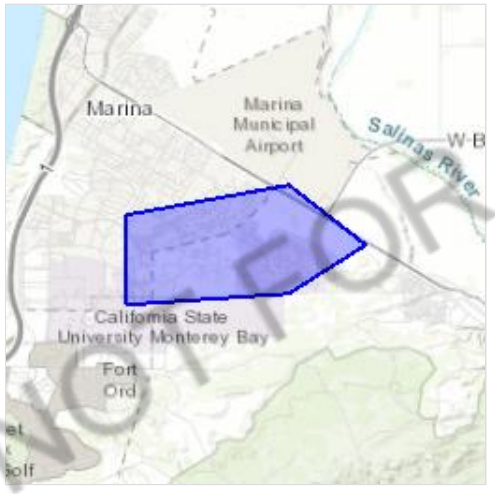
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Monterey County, California



Local office

Ventura Fish And Wildlife Office

(805) 644-1766
(805) 644-3958

2493 Portola Road, Suite B
Ventura, CA 93003-7726

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS

California Condor Gymnogyps californianus — Endangered
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/8193

California Least Tern Sterna antillarum browni — Endangered
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/8104

Least Bell's Vireo Vireo bellii pusillus — Endangered
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/5945

Marbled Murrelet Brachyramphus marmoratus — Threatened
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/4467

Southwestern Willow Flycatcher Empidonax traillii extimus — Endangered
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/6749

Western Snowy Plover Charadrius nivosus nivosus — Threatened
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/8035

Amphibians

NAME	STATUS

California Red-legged Frog Rana draytonii — Threatened
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/2891

California Tiger Salamander Ambystoma californiense — Threatened
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/2076

Santa Cruz Long-toed Salamander Ambystoma macrodactylum croceum — Endangered
There is **proposed** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/7405

Fishes

NAME	STATUS
Tidewater Goby Eucyclogobius newberryi There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/57	Endangered

Insects

NAME	STATUS
Smith's Blue Butterfly Euphilotes enoptes smithi There is **proposed** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/4418	Endangered

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp Branchinecta lynchi There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/498	Threatened

Flowering Plants

NAME	STATUS
Contra Costa Goldfields Lasthenia conjugens There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/7058	Endangered
Marsh Sandwort Arenaria paludicola No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2229	Endangered
Menzies' Wallflower Erysimum menziesii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2935	Endangered
Monterey Gilia Gilia tenuiflora ssp. arenaria No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/856	Endangered

Monterey Spineflower Chorizanthe pungens var. pungens There is **final** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/396	Threatened
Yadon's Piperia Piperia yadonii There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/4205	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	TYPE
Monterey Spineflower Chorizanthe pungens var. pungens https://ecos.fws.gov/ecp/species/396#crithab	Final

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ

below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Allen's Hummingbird Selasphorus sasin This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9637	Breeds Feb 1 to Jul 15
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Jan 1 to Aug 31
Black Oystercatcher Haematopus bachmani This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9591	Breeds Apr 15 to Oct 31
Burrowing Owl Athene cunicularia This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9737	Breeds Mar 15 to Aug 31

California Thrasher Toxostoma redivivum — Breeds Jan 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Clark's Grebe Aechmophorus clarkii — Breeds Jan 1 to Dec 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Yellowthroat Geothlypis trichas sinuosa — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/2084

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Lawrence's Goldfinch Carduelis lawrencei — Breeds Mar 20 to Sep 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9464

Lewis's Woodpecker Melanerpes lewis — Breeds Apr 20 to Sep 30
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9408

Long-billed Curlew Numenius americanus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5511

Marbled Godwit Limosa fedoa — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9481

Nuttall's Woodpecker Picoides nuttallii — Breeds Apr 1 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Rufous Hummingbird selasphorus rufus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8002

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Song Sparrow Melospiza melodia — Breeds Feb 20 to Sep 5
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Spotted Towhee Pipilo maculatus clementae — Breeds Apr 15 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/4243

Tricolored Blackbird Agelaius tricolor — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3910

Whimbrel Numenius phaeopus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9483

Willet Tringa semipalmata — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wrentit Chamaea fasciata — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Yellow-billed Magpie Pica nuttalli — Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9726

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

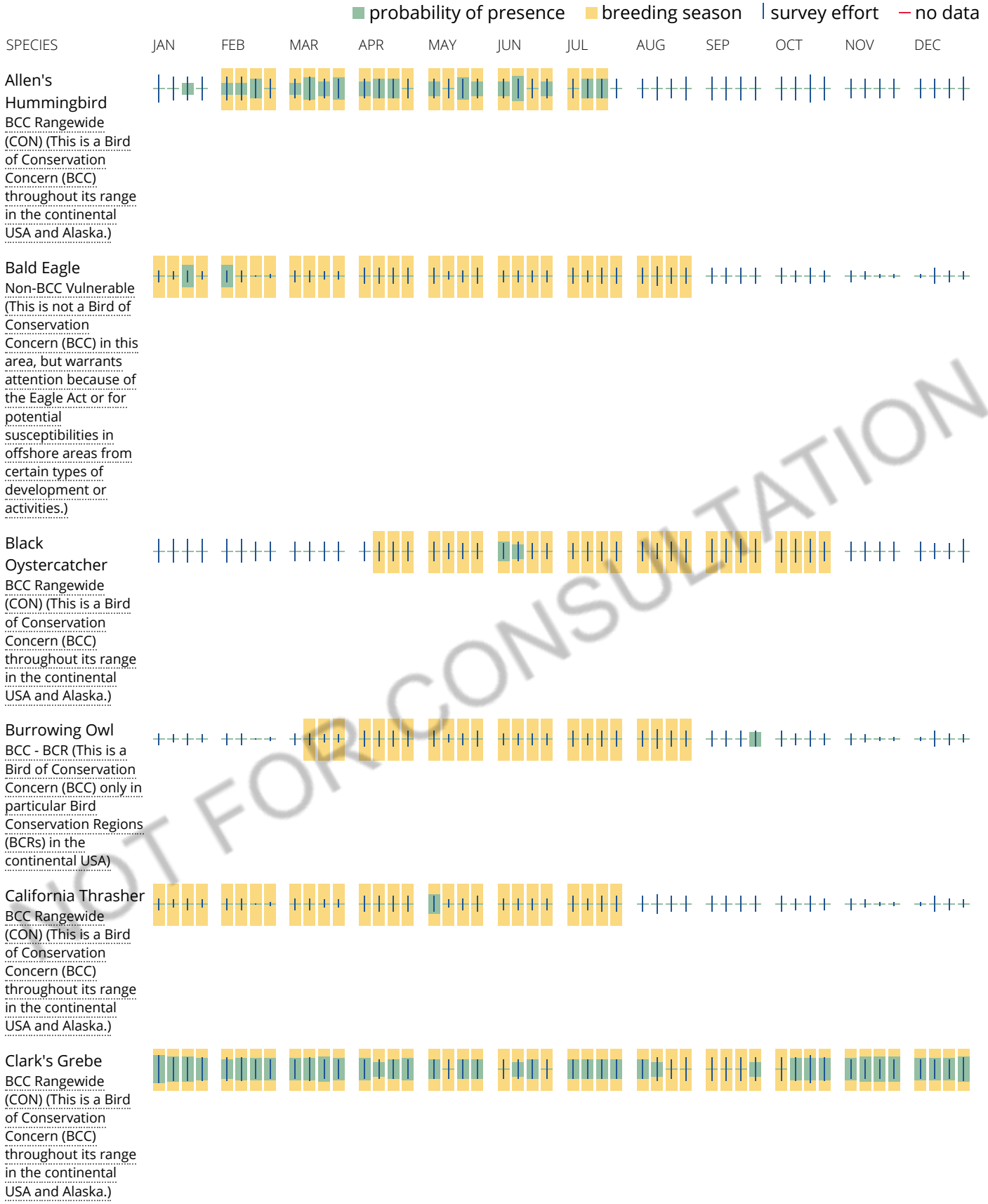
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

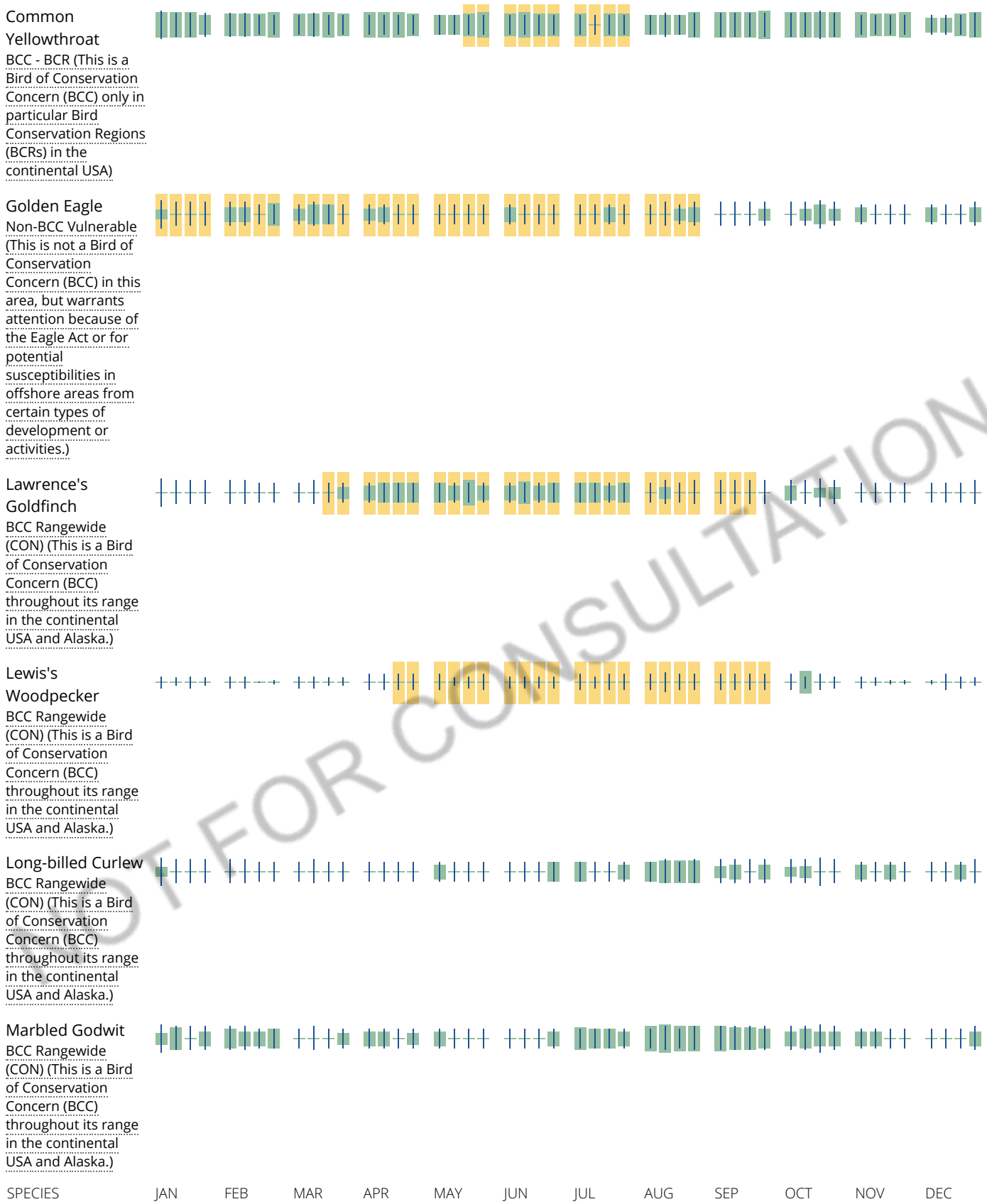
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Nuttall's Woodpecker
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

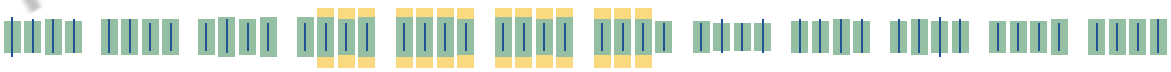
Oak Titmouse
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Rufous Hummingbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

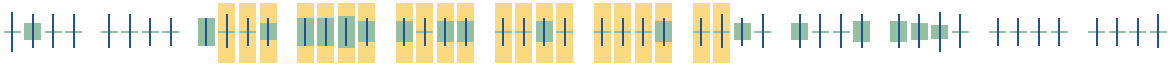
Short-billed Dowitcher
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Song Sparrow
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Spotted Towhee
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



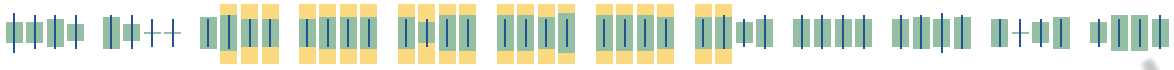
Tricolored Blackbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



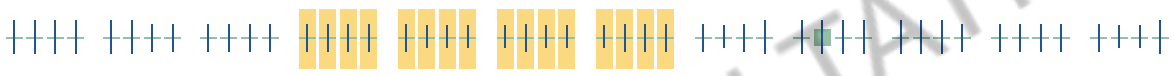
Whimbrel
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Willet
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Wrentit
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Yellow-billed Magpie
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER FORESTED/SHRUB WETLAND

PSSA
PSSB

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Appendix B

GEOTECHNICAL INVESTIGATION

MCWD A1/A2 RESERVOIRS & B/C ZONES BPS PROJECT

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CORNERSTONE EARTH GROUP

Type of Services	**Geotechnical Investigation**
Project Name	**MCWD A1/A2 Reservoirs and B/C Booster Pump Station**
Location	**8th Street and 6th Avenue Marina, California**
Client	**Schaaf and Wheeler**
Client Address	**3 Quail Rim Circle, Suite 101 Salinas, California**
Project Number	**187-55-1**
Date	**August 26, 2019**

DRAFT

Prepared by **Matthew J. Schaffer, P.E.**
Senior Project Engineer
Geotechnical Project Manager

Scott E. Fitinghoff, P.E., G.E.
Senior Principal Engineer
Quality Assurance Reviewer

CORNERSTONE EARTH GROUP

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CORNERSTONE EARTH GROUP

APPENDIX C: CORNERSTONE EARTH GROUP 2007 EXPLORATION LOGS AND LABORATORY DATA

Type of Services	**Geotechnical Investigation**
Project Name	**MCWD A1/A2 Reservoirs and B/C Booster Pump Station**
Location	**8th Street and 6th Avenue Marina, California**

SECTION 1: INTRODUCTION

This geotechnical report was prepared for the sole use of Schaaf and Wheeler for the MCWD A1/A2 Reservoirs and B/C Booster Pump Station project located within the California State Monterey Bay campus near 8th Street and 6th Avenue in Marina, California. The location of the site is shown on the Vicinity Map, Figure 1 and Site Plan, Figure 2. For our use, we were provided with the following documents:

- A conceptual site plan titled "A1/A2 Reservoirs and B/C Booster Pump Station, Conceptual Site Plan," prepared by Schaaf & Wheeler, dated July 12, 2019.
- A topographic map, Sheets 1 and 2, titled "Marina Coast Water District 'A' Reservoirs, Proposed Tank Site & Pipeline Alignment, Topographic Map, CSUMB, Marina, California," prepared by Whitson Engineers, issued as draft for review only dated July 3, 2019.
- A tank layout plan titled "A1/A2 Reservoirs and B/C Booster Pump Station, Tank Layout," prepared by Schaaf & Wheeler, dated July 12, 2019.
- A tank detail sheet titled "A1/A2 Reservoirs and B/C Booster Pump Station, Tank Details," prepared by Schaaf & Wheeler, dated July 12, 2019.

As you know, in 2007 and 2008 the proposed reservoir tanks and pump station project had begun were to be located east of the current proposed location. At that time, Cornerstone Earth Group performed a geotechnical investigation and presented our findings in a report titled "Geotechnical Investigation, MCWD A1/A2 Reservoir & B/C Booster Pump Station, 8th Street Cut-Off and 6th Ave, Marina, California," dated July 19, 2007.

1.1 PROJECT DESCRIPTION

The project site is within the California State University Monterey Bay campus located near 8th Street and 6th Avenue in Marina, California. The project will include two potable water storage tanks (A1/A2 Reservoirs) and a new pump station (B/C Booster Pump Station) to pump water from the A1/A2 Reservoirs to the existing B and C pressure zone reservoirs and distribution systems. Currently, both water storage tanks are planned to hold about 2 million gallons. Pipeline modifications and sequencing to the existing A, B, and C zone transmission pipelines and additional pipelines and appurtenances as required for replacing the existing B/C Booster Station and Sand Tank for a complete and operable storage and pumping system are also planned.

The planned reservoir tanks are to be ground supported, welded carbon steel designed and constructed in accordance with the American Water Works Association (AWWA) D100-11 standards. The tanks are to be constructed within the upper level of the site and are currently to have a bottom of tank/top of foundation Elevation 199 feet (NAVD88 datum). The tanks are to have a 110-foot diameter, be 45 feet tall from the bottom of tank up to the roof vent, and hold water up to Elevation 230 feet (corresponding up to a 31-foot height of water in each tank). The tanks are to be supported by a foundation around the outside ring of each tank and a foundation beneath the column in the center of each tank. Each tanks steel bottom between the ring foundation and center column foundation is to be supported directly on the subgrade soils beneath.

The planned pump station is to be one-story, concrete/CMU frame construction, and designed using the 2019 California Building Code (CBC) standards. The pump station will be constructed into the existing slope between the upper and lower levels of the site with the top of pump station (roof) at Elevation 199 feet and the finish floor elevation at Elevation 186 feet (NAVD88 datum). The subgrade for the building will be at about Elevation 184 to 185 feet and the upper level of the site may be graded such that the roof of pump station and upper level grades are similar at Elevation 199 feet.

The primary pipeline modifications in proximity to the proposed pump station will be installed within a pipe easement located within the sloped area between the upper and lower levels of the site. Other appurtenant utilities, landscaping and improvements necessary for site development are also planned.

Structural loads are not currently known for the proposed reservoir tanks and pump station structure; however, structural loads are expected to be typical of similar type structures. Grading is anticipated to include cuts and fills on the order of 2 to 4 feet for construction of the tanks. Grading for the pump station pad will include cuts up to about 10 to 13 feet and cuts up to about 10 feet for installation of the new distribution pipeline is anticipated.

An existing detention basin, located less than a ¼ mile to the northwest of the proposed tanks and pump station, is planned to be utilized for retention of tank water in the event the tanks would need to be emptied.

1.2 SCOPE OF SERVICES

Our scope of services was presented in our proposal dated April 11, 2019 and consisted of field and laboratory programs to evaluate physical and engineering properties of the subsurface soils, engineering analysis to prepare recommendations for site work and grading, tank and building foundations, lateral earth pressures for retaining wall design, temporary shoring, flatwork, and pavements, and preparation of this report. Brief descriptions of our exploration and laboratory programs are presented below.

1.3 EXPLORATION PROGRAM

Field exploration consisted of four borings drilled on June 26, 2019 with truck-mounted, hollow-stem auger drilling equipment. The borings were drilled to depths ranging from 21½ to 51½ feet. The borings were backfilled with cement grout in accordance with local requirements; exploration permits were obtained as required by local jurisdictions.

The approximate locations of our exploratory borings are shown on the Site Plan, Figure 2. Details regarding our field program are included in Appendix A.

1.3.1 Previous Exploration Program

Our 2007 field exploration consisted of five borings drilled on June 13 and 18, 2007, using hollow-stem auger drilling equipment. The borings were drilled to depths ranging from approximately 20 to 76½ feet. The approximate locations of our 2007 borings are shown on the Site Plan, Figure 2. Exploration logs from our 2007 borings are included in Appendix C.

1.4 LABORATORY TESTING PROGRAM

In addition to visual classification of samples, the laboratory program focused on obtaining data for foundation design and seismic ground deformation estimates. Testing included moisture contents, dry densities, and washed sieve analyses. Details regarding our laboratory program are included in Appendix B.

1.5 CORROSION EVALUATION

Two samples from our borings at depths of 1½ and 3½ feet were tested for saturated resistivity, pH, and soluble sulfates and chlorides. The results are presented in Appendix B. Additionally, four samples from our 2007 borings at depths of 1 to 4½ feet were tested as above. Results from these tests are presented in Appendix C. In general, the on-site soils can be characterized as very mildly corrosive to buried metal, and non-corrosive to buried concrete.

1.6 ENVIRONMENTAL SERVICES

Environmental services were not requested for this project. If environmental concerns are determined to be present during future evaluations, the project environmental consultant should review our geotechnical recommendations for compatibility with the environmental concerns.

SECTION 2: REGIONAL SETTING

2.1 GEOLOGICAL SETTING

The site is located within the coast range geomorphic province of central California. Throughout the Cenozoic Era central California has been affected by tectonic forces associated with lateral or transform plate motion between the North American and Pacific crustal plates, producing a complex system of northwest-trending faults - the San Andreas Fault system (Page, 1998). Uplift, erosion and subsequent re-deposition of sedimentary rocks within this province have been driven primarily by the northwest directed, strike-slip movement of the tectonic plates and the associated northeast oriented compressional stress. The northwest-trending coastal mountain ranges are the result of an orogeny (formation of mountains by the process of tectonic uplift) believed to have been occurring since the Pleistocene epoch (approximately 2-3 million years before present).

The portion of the Monterey Bay area where the site exists is within the Salina Block, which is bound by the San Andreas Fault on the east, and by the San Gregorio - Palo Colorado Fault to the west. The Salina block is composed of an elongate prism of granites and metamorphic rock types. The Salina basement complex is overlain primarily by marine sedimentary rocks of tertiary age and terrestrial rocks of Pliocene to Pleistocene age, and modern dune and alluvial deposits.

2.2 REGIONAL SEISMICITY

The San Francisco Bay area region is one of the most seismically active areas in the Country. While seismologists cannot predict earthquake events, geologists from the U.S. Geological Survey have recently updated earlier estimates from their 2015 Uniform California Earthquake Rupture Forecast (Version 3) publication. The estimated probability of one or more magnitude 6.7 earthquakes (the size of the destructive 1994 Northridge earthquake) expected to occur somewhere in the San Francisco Bay and Monterey Bay areas has been revised (increased) to 72 percent for the period 2014 to 2043 (Aagaard et al., 2016). The faults in the region with the highest estimated probability of generating damaging earthquakes between 2014 and 2043 are the Hayward (33%), Rodgers Creek (33%), Calaveras (26%), and San Andreas Faults (22%). In this 30-year period, the probability of an earthquake of magnitude 6.7 or larger occurring is 22 percent along the San Andreas Fault and 33 percent for the Hayward or Rodgers Creek Faults. As seen with damage in San Francisco and Oakland due to the 1989 Loma Prieta earthquake that was centered about 50 miles south, significant damage can occur at considerable distances. Higher levels of shaking and damage would be expected for earthquakes occurring at closer distances.

The faults considered capable of generating significant earthquakes are generally associated with the well-defined areas of crustal movement, which trend northwesterly. The table below presents the State-considered active faults within 25 kilometers of the site.

Table 1: Approximate Fault Distances

Fault Name	Distance	
	(miles)	(kilometers)
Rinconada	2.5	4.1
Monterey Bay - Tularcitos	5.7	9.1
San Gregorio	13.9	22.3
Zayante-Vergeles	14.8	23.8

A regional fault map is presented as Figure 3, illustrating the relative distances of the site to significant fault zones.

SECTION 3: SITE CONDITIONS

3.1 SITE BACKGROUND AND SURFACE DESCRIPTION

The proposed reservoir tanks and booster pump station project will be constructed on the former Fort Ord military base and is currently within the California State University Monterey Bay campus. The project area was formerly developed by the military and the previous structures have been demolished leaving an undeveloped area.

The proposed site for the reservoir tanks and booster pump station can be broken into two levels separated by a landscape berm. The upper and lower levels are currently generally open asphalt concrete areas, which serve as parking areas as well as storage areas for stockpiled debris and soil. The landscape berm is generally covered with ice plant, some large shrubs, and some large mature trees.

The upper level slopes downward from the southwest to the northeast from approximate Elevation 201 feet to Elevation 195 feet (NAVD88 datum). The landscape berm initially rises slightly about a foot above the upper level and then slopes down about 14 to 15 feet to the lower level at approximate Elevation 181 to 182 feet at the toe of slope. The berm slopes have an inclination of 2:1 (horizontal:vertical) or flatter.

The proposed reservoir tanks are to be located within the upper level and the pump station is to be located within the landscape berm adjacent to the northern end of the upper level. The utility corridor and pipe easement for the primary pipeline modifications in proximity to the pump station runs east-west within the northern side of landscaping berm adjacent to the lower level of the site.

Surface pavements within the upper and lower level generally consisted of 2 to 3 inches of asphalt concrete over 4 to 6 inches of aggregate base. Based on visual observations, the existing pavements are in poor to moderate shape with areas of significant alligator cracking.

3.1.1 Existing Detention Basin

The existing detention basin, which is to be utilized for dispersion of the reservoir tanks water in the event of a tank failure, is located less than a ¼ mile to the northwest of the proposed tanks and pump station and is bounded by 5th Avenue to the west, 8th Street to the north/northeast, and an abandoned road to the south/southeast. The bottom of existing basin extends about 10 to 15 feet below the surrounding roadways and is generally covered with ice plant, shrubs, weeds, and a few mature trees. The existing detention basin is shown on Figure 5.

3.2 SUBSURFACE CONDITIONS

Borings EB-1 and EB-2 were drilled in the lower parking lot to the north of the landscape berm. Boring EB-1 was near the toe of the landscape berm slope, adjacent to the north side of the proposed pump station. Boring EB-2 was offset slightly from the toe of the landscape berm and was adjacent to the pipe easement east of the proposed pump station. Below the surface pavement, Boring EB-1 encountered dense poorly graded sand to a depth of 9 feet, underlain by medium dense poorly graded sand with silt to a depth of 11 feet, underlain by dense poorly graded sand with silt to a depth of 17 feet, underlain by very dense poorly graded sand to the maximum depth explored of 30 feet beneath the surface. Below the surface pavement, Boring EB-2 encountered dense poorly graded sand to the maximum depth explored of 21½ feet below the surface.

Borings EB-3 and EB-4 were drilled in the upper parking lot to the south of the landscape berm. Boring EB-3 was adjacent to the south side of the proposed pump station and slightly north of the northern reservoir tank. Boring EB-4 was within the proposed footprint of the southern reservoir tank near the southern side of the tank. Below the surface pavement, Boring EB-3 encountered undocumented fill consisting of dense to very dense poorly graded sand to a depth of 7 feet. The fill was underlain by generally medium dense poorly graded sand with silt to a depth of 17 feet, underlain by medium dense to very dense poorly graded sand to the maximum depth explored of 50 feet. Below the surface pavement, Boring EB-4 encountered undocumented fill consisting of dense silty sand and dense to very dense poorly graded sand to a depth of 13 feet below the surface. The fill was underlain by medium dense to dense poorly graded sand with silt to a depth of 20 feet, underlain by loose to medium dense poorly graded sand with silt to a depth of 28 feet The poorly graded sand with silt was underlain by medium dense poorly graded sand to a depth of 32 feet, underlain by very dense poorly graded sand to a depth of 37 feet. The poorly graded sand was underlain by medium dense to dense poorly graded sand with silt to the maximum depth explored of 51½ feet. Figure 4, Cross Section A-A', depicts the generalize soil profile in the location of the reservoir tanks and pump station.

3.2.1 Plasticity/Expansion Potential

The subsurface soils are silty and poorly graded sands with about 16 percent or less fines passing the No. 200 sieve. These soils are non-plastic and have very low expansion potential.

3.2.2 In-Situ Moisture Contents

Laboratory testing indicated that the in-situ moisture contents generally range from about 2 to 13 percent within the upper 20 feet, corresponding to about 8 percent below optimum to near the estimated laboratory optimum moisture.

3.3 GROUNDWATER

Groundwater was not encountered in our current borings drilled to a maximum depth of 51½ feet below existing grades. Additionally, groundwater was not encountered in our previous 2007 borings to a maximum depth of 76½ feet below site grades.

Groundwater levels are not currently mapped at the site by the State of California. We reviewed the GeoTracker website regarding groundwater depths in the site area. Based on our GeoTracker website search, there is no available data within the site area.

Fluctuations in groundwater levels occur due to many factors including seasonal fluctuation, underground drainage patterns, regional fluctuations, and other factors. Based on the available data, we anticipate groundwater to be a depths greater than 50 feet beneath the site.

3.4 CORROSION SCREENING

We tested two samples collected at depths of 1½ and 3½ feet for resistivity, pH, soluble sulfates, and chlorides. We also tested four samples collected at depths of 1 to 4½ feet during our 2007 investigation. The laboratory test results for our current and previous borings are summarized in Table 2A.

Table 2A: Summary of Corrosion Test Results

Sample Location	Depth (feet)	Soil pH[2]	Resistivity[3] (ohm-cm)	Chloride[4] (mg/kg)	Sulfate[5,6] (mg/kg)
EB-2	3½	7.3	45,617	7	82
EB-4	1½	6.8	20,890	6	249
EB-2[1]	1 to 2½	7.6	26,932	<2	16
EB-2[1]	3 to 4½	6.6	40,342	<2	13
EB-5[1]	1 to 2½	7.8	23,738	<2	20
EB-5[1]	3 to 4½	7.8	29,456	<2	16

Notes: [1]2007 Boring
[2]ASTM G51
[3]ASTM G57 - 100% saturation
[4]ASTM 4327 / Cal 422-mod (2007 borings)
[5]ASTM 4327 / Cal 417-mod (2007 borings)
[6]1 mg/kg = 0.0001 % by dry weight

Many factors can affect the corrosion potential of soil including moisture content, resistivity, permeability, and pH, as well as chloride and sulfate concentration. Typically, soil resistivity, which is a measurement of how easily electrical current flows through a medium (soil and/or

water), is the most influential factor. In addition to soil resistivity, chloride and sulfate ion concentrations, and pH also contribute in affecting corrosion potential.

3.4.1 Preliminary Soil Corrosion Screening

Based on the laboratory test results summarized in Table 2 and published correlations between resistivity and corrosion potential, the soils are considered very mildly corrosive to buried metallic improvements (Chaker and Palmer, 1989).

In accordance with the 2019 CBC Section 1904.1, alternative cementitious materials for different exposure categories and classes shall be determined in accordance with ACI 318-14 Table 19.3.1.1, Table R19.3.1, and Table 19.3.2.1. Based on the laboratory sulfate test results, no cement type restriction is required. We have summarized applicable exposure categories and classes from ACI 318-14, Table 19.3.1.1 below in Table 2B.

Table 2B: ACI 318-14 Table 19.3.1.1 Exposure Categories and Classes

Freezing and Thawing (F)	Sulfate (S, soil)	In Contact with Water (W)	Corrosion Protection of Reinforcement (C)
F0[1]	S0[2]	W0[3]	C0[4]

1 (F0) "Concrete not exposed to freezing-and-thawing cycles" (ACI 318-14)
2 (S0) "Water soluble sulfate in soil, percent by mass is less than 0.10" (ACI 318-14)
3 (W0) "Concrete dry in service, Concrete in contact with water and low permeability is not required" (ACI 318-14)
4 (C0) "Concrete dry or protected from moisture" (ACI 318-14)

We recommend the structural engineer and a corrosion engineer be retained to confirm the above information and provide additional recommendations, as needed.

3.5 GROUNDWATER INFILTRATION WITHIN EXISTING DETENSION BASIN

3.5.1 Field Infiltration Tests

An infiltration test was performed to estimate the rate of infiltration in the soils within the bottom of the existing detention basin as shown on Figure 5. Infiltration testing was performed within this basin so that the design team can determine the feasibility of using the basin to drain the reservoir tanks in the event the tanks would need to be emptied.

One infiltration test, I-1, was performed within the bottom of the existing detention basin on June 27, 2019. The approximate location of the infiltration test is shown on Figure 5. We also performed three shallow excavations using a hand auger in proximity to our infiltration test. The shallow excavations extended to a depth of approximately 5 feet beneath the bottom of the existing basin. The soils encountered at these locations were fairly consistent with low fines contents and classified as generally poorly graded sands with silt.

The infiltration test was performed using a double-ring infiltrometer in accordance with ASTM D3385 test methods (constant head) at a depth of approximately 1 foot below the bottom of

existing basin. The rings were embedded at about 6 inches below the exposed soil level, filled with approximately 4 inches of water and allowed to presoak for about 20 minutes before starting the test readings. Following presoaking, the infiltration test was conducted for approximately 1½ hours. A fairly constant infiltration rate was maintained during the last hour of testing. The test result is summarized in the following table.

Table 3: Double-Ring Infiltration Test Results

Test Location	Infiltration Rate (inches/hour)
I-1	27

The test result may not be truly indicative of the long-term, in-situ infiltration. Other factors including soil stratifications, heterogenous deposits, overburden stress, and other factors can influence infiltration results. We recommend that an appropriate factor of safety be considered for the design of infiltration systems at the site.

SECTION 4: GEOLOGIC HAZARDS

4.1 FAULT RUPTURE

As discussed in Section 2, several significant faults are located within 25 kilometers of the site; however, the site is not located within a State-designated Alquist Priolo Earthquake Fault Zone. As shown in Figure 3, no known surface expression of fault traces is thought to cross the site; therefore, fault rupture hazard is not a significant geologic hazard at the site.

4.2 ESTIMATED GROUND SHAKING

Moderate to severe (design-level) earthquakes can cause strong ground shaking, which is the case for most sites within the Central Coast Area. As mentioned, the reservoir tanks are to be designed and constructed in accordance with AWWA D100-11 and the pump station is to be designed and constructed in accordance with the 2019 California Building Code (CBC).

AWWA D100-11 indicates seismic design and parameters are to be in accordance with procedures outline in ASCE 7-05. In accordance with ASCE 7-05, for Seismic Design Categories D through F, the peak ground acceleration (PGA) is permitted to be determined based on $S_s/2.5$. As such, for our liquefaction and dry sand settlement analysis for the reservoir tanks, we used a PGA of 0.514g.

As mentioned above, we understand the pump station is to be designed and constructed in accordance with the 2019 CBC. Based on our review of the 2019 CBC, a site-specific hazard analysis in accordance with ASCE 7-16 Chapter 21 will be required. The analysis should be performed using the 2014 USGS fault model and the computer program, EZ-Frisk, that we have been using to perform the analysis has not been updated to incorporate the 2014 USGS fault model (UCERF3). We are in the process of reviewing and validating alternative software, but it

is not ready to be implemented until early next year. Therefore, we have provided seismic coefficients in Section 7.3 of this report based on the 2016 CBC, but they are for reference only and **should not** be used for design if the project will be in accordance with the 2019 CBC. For our liquefaction and dry sand settlement analysis for the pump station, a PGA_M of 0.562g was estimated for analysis using a value equal to $F_{PGA} \times$ PGA, as allowed in the 2016 edition of the California Building Code. We should be further consulted regarding the 2019 CBC seismic coefficients and PGA before structural design is started and to review our estimated seismic settlements for the pump station. We will provide an update as our information and processes are developed.

4.3 LIQUEFACTION POTENTIAL

The site is not currently mapped by the State of California, but is within a zone mapped as having a low liquefaction potential (Rosenberg, 2001, and Stanford University, 2015). We screened the site for liquefaction during our site exploration by retrieving samples from the site to depths of at least 50 feet, performing visual classification on sampled materials, and performing various tests to further classify the soil properties.

During strong seismic shaking, cyclically induced stresses can cause increased pore pressures within the soil matrix that can result in liquefaction triggering, soil softening due to shear stress loss, potentially significant ground deformation due to settlement within sandy liquefiable layers as pore pressures dissipate, and/or flow failures in sloping ground or where open faces are present (lateral spreading) (NCEER 1998). Limited field and laboratory data is available regarding ground deformation due to settlement; however, in clean sand layers settlement on the order of 2 to 4 percent of the liquefied layer thickness can occur. Soils most susceptible to liquefaction are loose, non-cohesive soils that are saturated and are bedded with poor drainage, such as sand and silt layers bedded with a cohesive cap.

Soils with corrected “N” values greater than 30 are generally not considered liquefiable, and can be pre-screened for liquefaction triggering. Some loose to medium dense soils with corrected “N” values less than 30 were encountered at locations and depths shallower than 50 feet across the site. However, as discussed, groundwater is not anticipated to be present within the upper 50 feet at the site. Based on this information, in our opinion, the potential for liquefaction to affect the proposed improvements is very low.

4.4 LATERAL SPREADING

Lateral spreading is horizontal/lateral ground movement of relatively flat-lying soil deposits towards a free face such as an excavation, channel, or open body of water; typically lateral spreading is associated with liquefaction of one or more subsurface layers near the bottom of the exposed slope. As failure tends to propagate as block failures, it is difficult to analyze and estimate where the first tension crack will form.

The potential for liquefaction to occur at the site is very low; therefore, in our opinion, the potential for lateral spreading is also very low.

4.5 SEISMIC SETTLEMENT/UNSATURATED SAND SHAKING

Loose to medium dense unsaturated sandy soils can settle during strong seismic shaking resulting in settlement of the ground surface and improvements. Seismic compression of unsaturated sand occurs due to rearrangement of soil particles during shaking and compression of the void space. The magnitude of volumetric compression of unsaturated sand is largely a function of seismic loading (effective shear strain and number of cycles) and the state of the soil (relative density and degree of saturation).

Our borings encountered loose to medium dense sands at varying depths across the site. We evaluated the potential for seismic compaction of the sand layers based on the work by Pradell (1998). Our analyses indicate that the sands may settle on the order of less than ¼ inch in the location of Borings EB-1 and EB-2 and on the order of ⅓ inch and 1 inch in the location of Borings EB-3 and EB-4, respectively, following strong seismic shaking.

4.6 SLOPE STABILITY

As mentioned, the site consists of an upper and lower level with a landscape berm between that transitions grades from the upper to lower levels. The northern end of the upper level is about 14 to 15 feet higher than the lower level at the toe of the landscape berm slope and the berm slopes have an inclination of 2:1 (horizontal:vertical) or flatter.

We performed a screening level static and seismic analysis of the slope through Cross Section A-A'. Computer assisted slope stability analysis was performed using the computer program SLIDE Version 8.016 and circular failure modes. An areal tank load of 2,000 pounds per square foot was estimated based on the size and capacity of the tanks. Based on the current layout for the tanks and the estimated loading above, our screening level analysis of the existing slope indicates the slope to be stable for both seismic and static loading conditions, with factors of safety greater than 1.0 for seismic loading and greater than 1.5 for static loading.

4.7 TSUNAMI/SEICHE

The site is not mapped within a State-designated tsunami inundation area (CGS, 2009). The site is approximately 1⅓ miles inland from the Monterey Bay shoreline and is approximately 180 to 200 feet above mean sea level; therefore, the potential for inundation due to tsunami or seiche is considered low.

4.8 FLOODING

Based on our internet search of the Federal Emergency Management Agency (FEMA) flood map public database, the site is located within Zone X, described as an "Area of minimal flood hazard." We recommend the project civil engineer be retained to confirm this information.

SECTION 5: CONCLUSIONS

5.1 SUMMARY

From a geotechnical viewpoint, the project is feasible provided the concerns listed below are addressed in the project design. Descriptions of each concern with brief outlines of our recommendations follow the listed concerns.

- Potential for significant unsaturated sand seismic settlement and static settlement beneath reservoir tanks
- Potential for medium dense sands beneath pump station
- Undocumented fill
- Presence of cohesionless soils
- Retaining wall construction difficulties with cohesionless sands
- Highly erodible soils
- Differential movement at on-grade to on-structure transitions

5.1.1 Potential for Significant Unsaturated Sand Seismic Settlement and Static Settlement Beneath Reservoir Tanks

As discussed, our analysis of the unsaturated sand layers indicate there is a potential for about ⅓ to 1 inch of settlement of the sand layers during a significant seismic event in the location of the proposed reservoir tanks. Differential seismic settlements are estimated to be on the order of ½ to ⅔ over a horizontal distance of 50 feet.

Additionally, each reservoir tank is to hold approximately 2 million gallons of water. We estimate the average areal pressure from the water and tank steel will be approximately 2,000 pounds per square foot (psf). Based on this loading, we estimate total static settlements beneath the tanks to be on the order of 2 to 2¼ inches and differential static settlements to be on the order of 1 to 1¼ inches over a horizontal distance of 50 feet. The proposed tanks and tank foundations should be designed to tolerate the anticipated total and differential static and seismic settlements. Additional foundation recommendations are presented in the "Foundations" section of this report.

Based on our discussions with you, we understand the tanks can be designed for and accommodate these anticipated settlements. If design requirements change and the tanks are not able to be designed for the above settlements, additional recommendations and an alternative foundation will be required.

5.1.2 Potential for Medium Dense Sands Beneath Pump Station

As discussed, the booster pump station finished floor will be at Elevation 186 feet and subgrade will be at about Elevation 184 to 185 feet. Based on these depths, we anticipate medium dense sands to be located beneath the building's subgrade. As such, we recommend the building pad

be excavated to a minimum depth of Elevation 184 feet, processed, and compacted prior to footing and building slab construction. Additional recommendations are presented in the "Earthwork" section of this report.

5.1.3 Undocumented Fill

As discussed, Borings EB-3 and EB-4 encountered 7 and 13 feet, respectively, of dense to very dense undocumented fill within the upper level of the site. Borings within the lower level did not encountered undocumented fills. As discussed, the booster pump station finished floor will be at Elevation 186 feet and subgrade for the building will be at about Elevation 184 to 185 feet. As shown on Cross Section A-A', Figure 4, fills are anticipated to be present within the existing landscape berm. These fills may be removed during grading for the building pad to Elevation 184 feet. However, if fills are encountered at the building subgrade elevation, we recommend the fills be completely removed from within building area as we anticipate the fills within the berm to be variable in density and consistency. Additional recommendations are provided in the "Earthwork" section of this report.

For the reservoir tanks, as discussed, the fills encountered appear to be dense to very dense. As such, it is our opinion the fills within the location of the tanks can remain in place. However, the tanks should be designed for the estimated settlements. The subgrade in areas of cut and areas to receive additional fill within the tank footprints should be prepared and compacted in accordance with the "Earthwork" section of this report.

5.1.4 Presence of Cohesionless Soils

As mentioned, the site is underlain by cohesionless, sandy soils with low fines content. The sandy soil is likely not to stand vertical when excavated and excavation sidewalls for foundations, utility trenches, temporary slopes, booster pump station excavation, etc. may cave in or accumulate significant amount of slough. Trenches for utilities and other excavations will likely have to be sloped to accommodate the potential caving and sloughing conditions. Grading and excavation contractors should be made aware of this condition and plan on forming footings, sloping trench sidewalls, preparing slab-on-grade subgrade just prior to concrete placement, and other similar construction issues as relates to temporary shoring, utility excavations, etc. These issues are addressed within the "Earthwork" and "Foundations" sections of this report.

5.1.5 Retaining Wall Construction Difficulties with Cohesionless Sands

The sands consist of fine to medium sands with fines generally less than 16 percent. These sands will likely not stand vertical when excavated. The contractor who will construct the retaining walls along the back and sides of the booster pump station will need to address this issue. If temporary slopes are not sloped, top-down construction and/or temporary vertical elements, or other techniques for face stability, will likely be required. Recommendations addressing this concern are presented in the "Earthwork" and "Retaining Walls" section of this report.

5.1.6 Highly Erodible Soils

The sands encountered in our exploration and generally present at the site consist of fine to medium sands with fine contents generally less than 15 percent. These types of soils are highly subject to erosion from wind and water. We recommend that new final slopes in sand be 3:1 (H:V) or flatter to limit erosion. All exposed surfaces should be vegetated or otherwise protected from erosion. Additional recommendations are provided in the "Earthwork" section below.

5.1.7 Differential Movement At On-grade to On-Structure Transitions

As discussed, we understand the booster pump station will be constructed below-grade into the existing landscape berm that transitions between the upper and lower levels of the site. The top of building will be at Elevation 199 feet and the adjacent area may also be graded to this same elevation. Further, we understand trucks will likely be driving up to and adjacent to the building. As such, improvements may transition from on-grade support to overlying the below-grade wall of the building. Where the improvements transition from on-grade to on-structure, varying amounts of settlement can be anticipated between the structure and the joining improvements supported on-grade due to difficulty in compacting retaining wall backfill, seasonal soil movement, differing response to vehicle loading, as well as other causes. As such, we recommend that retaining wall backfill be compacted to 95 percent where surface improvements are planned (see "Retaining Wall" section).

5.2 PLANS AND SPECIFICATIONS REVIEW

We recommend that we be retained to review the geotechnical aspects of the project structural, civil, and landscape plans and specifications, allowing sufficient time to provide the design team with any comments prior to issuing the plans for construction.

5.3 CONSTRUCTION OBSERVATION AND TESTING

As site conditions may vary significantly between the small-diameter borings performed during this investigation, we also recommend that a Cornerstone representative be present to provide geotechnical observation and testing during earthwork and foundation construction. This will allow us to form an opinion and prepare a letter at the end of construction regarding contractor compliance with project plans and specifications, and with the recommendations in our report. We will also be allowed to evaluate any conditions differing from those encountered during our investigation, and provide supplemental recommendations as necessary. For these reasons, the recommendations in this report are contingent of Cornerstone providing observation and testing during construction. Contractors should provide at least a 48-hour notice when scheduling our field personnel.

SECTION 6: EARTHWORK

6.1 SITE DEMOLITION

All existing improvements not to be reused for the current development, including all foundations, flatwork, pavements, utilities, and other improvements should be demolished and removed from the site. Recommendations in this section apply to the removal of these improvements, which may be present on the site, prior to the start of mass grading or the construction of new improvements for the project.

Cornerstone should be notified prior to the start of demolition, and should be present on at least a part-time basis during all backfill and mass grading as a result of demolition. Occasionally, other types of buried structures (wells, cisterns, debris pits, etc.) can be found on sites with prior development. If encountered, Cornerstone should be contacted to address these types of structures on a case-by-case basis.

Special care should be taken during the demolition and removal of existing improvements to minimize disturbance of the subgrade. Excessive disturbance of the subgrade, which includes either native or previously placed engineered fill, resulting from demolition activities can have serious detrimental effects on planned foundation and paving elements.

Existing foundations are typically mat-slabs, shallow footings, or piers/piles. If slab or shallow footings are encountered, they should be completely removed. If drilled piers are encountered, they should be cut off at an elevation at least 60-inches below proposed footings or the final subgrade elevation, whichever is deeper. The remainder of the drilled pier could remain in place. Foundation elements to remain in place should be surveyed and superimposed on the proposed development plans to determine the potential for conflicts or detrimental impacts to the planned construction. Following review, additional mitigation or planned foundation elements may need to be modified.

6.1.2 Abandonment of Existing Utilities

All utilities should be completely removed from within the planned pump station and reservoir tank areas. Utilities extending beyond the building and tank areas may be abandoned in place provided the ends are plugged with concrete, they do not conflict with planned improvements, and that the trench fills do not pose significant risk to the planned surface improvements.

The risk for owners associated with abandoning utilities in place include the potential for future differential settlement of existing trench fills, and/or partial collapse and potential ground loss into utility lines that are not completely filled with grout.

6.2 SITE CLEARING AND PREPARATION

6.2.1 Site Stripping

The site should be stripped of all surface vegetation, and surface and subsurface improvements within the proposed improvement areas. Demolition of existing improvements is discussed in detail below. Surface vegetation and topsoil should be stripped to a sufficient depth to remove all material greater than 3 percent organic content by weight. Based on our site observations, surficial stripping should extend about 4 to 6 inches below existing grade in the landscaping berm area to remove the vegetation except in areas where trees and large shrubs will be removed. Deeper excavations should be anticipated in these areas to remove the root balls.

6.2.2 Tree and Shrub Removal

Trees and shrubs designated for removal should have the root balls and any roots greater than ½-inch diameter removed completely. Mature trees are estimated to have root balls extending to depths of 2 to 4 feet, depending on the tree size. Significant root zones are anticipated to extend to the diameter of the tree canopy. Grade depressions resulting from root ball removal should be cleaned of loose material and backfilled in accordance with the recommendations in the "Compaction" section of this report. A Cornerstone representative should be present to provide geotechnical observation and testing during backfill of the excavations.

6.3 BOOSTER PUMP STATION PAD PREPERATION

As discussed, the booster pump station finished floor is to be at Elevation 186 feet and subgrade will be at about Elevation 184 to 185 feet. We anticipate undocumented fills will likely be removed as part of the excavation to pad subgrade. However, if present, any remaining fills should be completely removed from within the building areas and to a lateral distance of at least 5 feet beyond the building footprint or a lateral distance equal to the fill depth below the perimeter footing, whichever is greater. Provided the fills meet the "Material for Fill" requirements below, the fills may be reused when backfilling the excavations. If materials are encountered that do not meet the requirements, such as debris, wood, trash, those materials should be screened out of the remaining material and be removed from the site. Backfill of excavations should be placed in lifts and compacted in accordance with the "Compaction" section below.

Following fill removal and replacement, if required as discussed above, due to the presence of medium dense sands, the exposed bottom of excavation (building pad subgrade at approximate Elevation 184 feet) should be scarified a minimum 12 inches, moisture conditioned, and compacted in accordance with the "Compaction" section of this report. We note that the subgrade soils are dry of optimum, as such, the contractor should be prepared to mix enough water into the soils to bring the soils above optimum moisture content. In the past, on similar projects with similar soil conditions, several rounds of mixing and watering were required to bring each lift to above optimum moisture content. The recommended performance specification for compaction of the base of the exposed subgrade for the building pad should consist of a minimum of five overlapping passes with a heavy-duty, vibratory smooth drum roller

(such as a Dynapac CA5000, Volvo SD160 or an approved equivalent) that will exert a minimum of 25,000 ft-lbs of energy. Subgrade compaction should extend at least 5 feet beyond the building footprint and perimeter foundations.

6.4 RESERVOIR TANKS PAD PREPERATION

As discussed, we understand the reservoir tank bottoms and pad will be at Elevation 199 feet. As such, to achieve pad grade, grades will need to be raised in the location of the northern tank while grades for the southern tank will require cut and fill. Following removal of the existing asphalt and underlying aggregate base section, in areas to receive additional fill, the exposed subgrade should be scarified a minimum 12 inches, moisture conditioned, and compacted in accordance with the “Compaction” section of this report. Additional fill should then be placed and compacted in lifts in accordance with the “Compaction” section. In areas requiring cut to finished pad grade, following removal of the existing asphalt, underlying aggregate base, and subgrade soil to pad grade, the subgrade should be scarified a minimum 12 inches, moisture conditioned, and compacted in accordance with the “Compaction” section of this report. We note that the subgrade soils are dry of optimum, as such, the contractor should be prepared to mix enough water into the soils to bring the soils above optimum moisture content. In the past, on similar projects with similar soil conditions, several rounds of mixing and watering were required to bring each lift to above optimum moisture content.

6.5 PAVEMENT AND FLATWORK SUBGRADE PREPERATION

Fills extending into pavement and flatwork areas may be left in place provided the upper 12 inches of fill below pavement and flatwork subgrade is reworked and recompacted as engineered fill. If pavements and flatwork extend into the landscape berm area, if looser fill materials are encountered, additional fill removal the depth of subgrade preparation may be required.

6.6 TEMPORARY CUT AND FILL SLOPES

The contractor is responsible for maintaining all temporary slopes and providing temporary shoring where required. Temporary shoring, bracing, and cuts/fills should be performed in accordance with the strictest government safety standards. On a preliminary basis, the upper 20 feet at the site may be classified as OSHA Soil Type C materials. A Cornerstone representative should be retained to confirm the preliminary site classification. Recommended soil parameters for temporary shoring are provided in the “Temporary Shoring” section of this report.

Excavations performed during site demolition and removal should be sloped at 1.5:1 (horizontal:vertical) within the upper 5 feet below building and reservoir/tank subgrade. Excavations extending more than 5 feet below building and tank subgrade and excavations in pavement and flatwork areas should be sloped in accordance with the OSHA soil classification.

6.7 BELOW-GRADE EXCAVATIONS

Below-grade excavations may be constructed with temporary slopes in accordance with the "Temporary Cut and Fill Slopes" section above if space allows. Alternatively, temporary shoring may support the planned cuts up to 15 feet. We have provided geotechnical parameters for shoring design in the section below. The choice of shoring method should be left to the contractor's judgment based on experience, economic considerations and adjacent improvements such as utilities, pavements, and foundation loads. Temporary shoring should support adjacent improvements without distress and should be the contractor's responsibility. A pre-condition survey including photographs and installation of monitoring points for existing site improvements should be included in the contractor's scope. We should be provided the opportunity to review the geotechnical parameters of the shoring design prior to implementation; the project structural engineer should be consulted regarding support of adjacent structures.

6.7.1 Temporary Shoring

Based on the site conditions encountered during our investigation, the cuts may be supported by soldier beams and tie-backs, braced excavations, soil nailing, or potentially other methods. If soil nailing is desired, the contractor should likely plan on limited sections where excavations may be left open, potentially constructing the nails through temporary sloped cuts, and other similar measures for sandy soil conditions. The use of hollow-core bar soil nails may be needed to address collapsing or caving soils.

Where shoring will extend more than about 10 feet, restrained shoring will most likely be required to limit detrimental lateral deflections and settlement behind the shoring. In addition to soil earth pressures, the shoring system will need to support adjacent loads such as construction vehicles and incidental loading, existing structure foundation loads, and street loading. We recommend that heavy construction loads (cranes, etc.) and material stockpiles be kept at least 15 feet behind the shoring. Where this loading cannot be set back, the shoring will need to be designed to support the loading. The shoring designer should provide for timely and uniform mobilization of soil pressures that will not result in excessive lateral deflections. Minimum suggested geotechnical parameters for shoring design are provided in the table below.

Table 4: Suggested Temporary Shoring Design Parameters

Design Parameter	Design Value
Minimum Lateral Wall Surcharge (upper 5 feet)	120 psf
Cantilever Wall – Triangular Earth Pressure	35 pcf
Restrained Wall – Uniform Earth Pressure	23H[(1)(2)]
Passive Pressure – Starting at 2 feet below the bottom of the adjacent excavation[(3)]	400 pcf up to 3,000 psf maximum uniform pressure

(1) H equals the height of the excavation; passive pressures are assumed to act over twice the soldier pile diameter
(2) The cantilever and restrained pressures are for drained designs. If undrained shoring is designed, an additional 62.4 pcf should be added for hydrostatic pressures.
(3) Bottom of adjacent excavation is bottom of mass excavation or bottom of footing excavation, whichever is deeper directly adjacent to the shoring element.
(4) If the reservoir tanks are constructed while temporary shoring is in-place and prior to construction of the pump station walls, the temporary shoring walls may need to be design for additional lateral wall surcharge from the tanks. Additional surcharge from the proposed tank is provided in the "Retaining Walls" section of this report.

If shotcrete lagging is used for the shoring facing, the permanent retaining wall drainage materials, as discussed in the "Wall Drainage" section of this report, will need to be installed during temporary shoring construction. At a minimum, 2-foot-wide vertical panels should be placed between soil nails or tiebacks that are spaced at 6-foot centers. For 8-foot centers, 4-foot-wide vertical panels should be provided. A horizontal strip drain connecting the vertical panels should be provided, or pass-through connections should be included for each vertical panel.

We performed our borings with hollow-stem auger drilling equipment and as such were not able to evaluate the potential for caving soils, which can create difficult conditions during soldier beam, tie-back, or soil nail installation; caving soils can also be problematic during excavation and lagging placement. The contractor is responsible for evaluating excavation difficulties prior to construction. Relatively clean sands were encountered during our exploration, pilot holes performed by the contractor may be desired to further evaluate caving soils prior to the finalization of the shoring budget.

In addition to anticipated deflection of the shoring system, other factors such as voids created by soil sloughing, and erosion of granular layers can create adverse ground subsidence and deflections. The contractor should attempt to cut the excavation as close to neat lines as possible; where voids are created they should be backfilled as soon as possible with sand, gravel, or grout.

As previously mentioned, we recommend that a monitoring program be developed and implemented to evaluate the effects of the shoring on adjacent improvements. All sensitive improvements should be located and monitored for horizontal and vertical deflections and distress cracking based on a pre-construction survey.

The above recommendations are for the use of the design team; the contractor in conjunction with input from the shoring designer should perform additional subsurface exploration they deem necessary to design the chosen shoring system. A California-licensed civil or structural engineer must design and be in responsible charge of the temporary shoring design. The contractor is responsible for means and methods of construction, as well as site safety.

6.8 SUBGRADE PREPARATION

After site clearing and demolition is complete, and prior to backfilling any excavations that extend below the excavation plane for subgrade resulting from over-excavation, the excavation subgrade and subgrade within areas to receive additional site fills, slabs-on-grade and/or pavements should be scarified to a depth of 12 inches, moisture conditioned, and compacted in accordance with the "Compaction" section below. We note that the subgrade soils are dry of optimum, as such, the contractor should be prepared to mix enough water into the soils to bring the soils above optimum moisture content. In the past, on similar projects with similar soil conditions, several rounds of mixing and watering were required to bring each lift to above optimum moisture content.

Sandy subgrades that are allowed to dry out after compaction will be subject to disturbance by both foot and vehicle traffic. In pavement areas, we recommend that aggregate base sections be placed immediately after the subgrade is prepared to reduce rework. In the building and reservoir tank areas, we recommend that subgrade compaction and proof rolling be performed within 24 hours of capillary break layer or slab-on-grade construction to reduce rework.

6.9 SUBGRADE STABILIZATION MEASURES

Native soil and fill materials consisting of sands and silty sands can become unstable due to high moisture content, whether from high in-situ moisture contents or from winter rains. When the moisture content increases over the laboratory optimum, it becomes more likely the materials will be subject to softening and yielding (pumping) from construction loading or become unworkable during placement and compaction.

The soils appear to range from below optimum to near optimum moisture content at the time of our drilling. However, during winter and spring, the soils may be significantly wetter. If construction is undertaken during the winter, spring, or wet periods, the contractor should anticipate drying native soils prior to reusing them as fill. During dryer periods, the contractor should anticipate moisture conditioning the soils prior to reusing them as fill. When the soils are wetter, repetitive rubber-tire loading, or other heavy or repetitive loads may de-stabilize the soils.

There are several methods to address potential unstable soil conditions and facilitate fill placement and trench backfill. Some of the methods are briefly discussed below. Implementation of the appropriate stabilization measures should be evaluated on a case-by-case basis according to the project construction goals and the particular site conditions.

6.9.1 Scarification and Drying

The subgrade may be scarified to a depth of 12 inches and allowed to dry to near optimum conditions, if sufficient dry weather is anticipated to allow sufficient drying. More than one round of scarification may be needed.

6.9.2 Removal and Replacement

As an alternative to scarification, the contractor may choose to over-excavate the unstable soils and replace them with dry on-site or import materials. A Cornerstone representative should be present to provide recommendations regarding the appropriate depth of over-excavation, whether a geosynthethic (stabilization fabric or geogrid) is recommended, and what materials are recommended for backfill.

6.9.3 Chemical Treatment

Where the unstable area exceeds about 5,000 to 10,000 square feet and/or site winterization is desired, chemical treatment with cement may be more cost-effective than removal and replacement, depending on access conditions. Recommended chemical treatment depths will typically range from 12 to 18 inches depending on the magnitude of the instability.

6.10 MATERIAL FOR FILL

6.10.1 Re-Use of On-site Soils

On-site soils with an organic content less than 3 percent by weight may be reused as general fill. General fill should not have lumps, clods or cobble pieces larger than 6 inches in diameter; 85 percent of the fill should be smaller than 2½ inches in diameter. Minor amounts of oversized material (smaller than 12 inches in diameter) may be allowed provided the oversized pieces are not allowed to nest together and the compaction method will allow for loosely placed lifts not exceeding 12 inches.

6.10.2 Potential Import Sources

Imported and non-expansive material should be inorganic with a Plasticity Index (PI) of 15 or less, and not contain recycled asphalt concrete where it will be used within the booster pump station areas. To prevent significant caving during trenching or foundation construction, imported material should have sufficient fines. Samples of potential import sources should be delivered to our office at least 10 days prior to the desired import start date. Information regarding the import source should be provided, such as any site geotechnical reports. If the material will be derived from an excavation rather than a stockpile, potholes will likely be required to collect samples from throughout the depth of the planned cut that will be imported. At a minimum, laboratory testing will include PI tests. Material data sheets for select fill materials (Class 2 aggregate base, ¾-inch crushed rock, quarry fines, etc.) listing current laboratory testing data (not older than 6 months from the import date) may be provided for our

review without providing a sample. If current data is not available, specification testing will need to be completed prior to approval.

Environmental and soil corrosion characterization should also be considered by the project team prior to acceptance. Suitable environmental laboratory data to the planned import quantity should be provided to the project environmental consultant; additional laboratory testing may be required based on the project environmental consultant's review. The potential import source should also not be more corrosive than the on-site soils, based on pH, saturated resistivity, and soluble sulfate and chloride testing.

6.11 COMPACTION REQUIREMENTS

All fills, and subgrade areas where fill, slabs-on-grade, and pavements are planned, should be placed in loose lifts 8 inches thick or less and compacted in accordance with ASTM D1557 (latest version) requirements as shown in the table below. In general, sandy/gravelly soils should be compacted with vibratory equipment. Open-graded materials such as crushed rock should be placed in lifts no thicker than 18 inches and consolidated in place with vibratory equipment. Each lift of fill and all subgrade should be firm and unyielding under construction equipment loading in addition to meeting the compaction requirements to be approved. The contractor (with input from a Cornerstone representative) should evaluate the in-situ moisture conditions, as the use of vibratory equipment on soils with high moistures can cause unstable conditions. General recommendations for soil stabilization are provided in the "Subgrade Stabilization Measures" section of this report.

Table 5: Compaction Requirements

Description	Material Description	Minimum Relative[1] Compaction (percent)	Moisture[2] Content (percent)
General Fill (tank and pump station pads)	On-Site Granular Soils	95	Optimum
Oil Sand Cushion	Material Mix per AWWA D100-11 Standard	95	Optimum
Trench Backfill – Pipe Zone	On-Site Granular Soils or Imported Well-Graded Bedding and Shading	95	Optimum

1 – Relative compaction based on maximum density determined by ASTM D1557 (latest version)
2 – Moisture content based on optimum moisture content determined by ASTM D1557 (latest version)
3 – Class 2 aggregate base shall conform to Caltrans Standard Specifications, latest edition, except that the relative compaction should be determined by ASTM D1557 (latest version)
4 – Using light-weight compaction or walls should be braced

Table 5 Continues

Table 5: Compaction Requirements (Continued)

Description	Material Description	Minimum Relative[1] Compaction (percent)	Moisture[2] Content (percent)
Trench Backfill – Trench Zone	On-Site Granular Soils or Imported Non-Expansive Material – Paved Areas	95	Optimum
	On-Site Granular Soils or Imported Non-Expansive Material – Unpaved Areas	90	Optimum
Trench Backfill – Street Zone	On-Site Granular Soils or Imported Non-Expansive Material	95	Optimum
Crushed Rock Fill (Pipe bedding and trench backfill)	Clean Crushed Rock	Consolidate In-Place	NA
Basement Wall Backfill	Without Surface Improvements	90	Optimum
Basement Wall Backfill	With Surface Improvements	95[4]	Optimum
Flatwork Subgrade	On-Site Granular Soils	90	Optimum
Flatwork Aggregate Base	Class 2 Aggregate Base[3]	90	Optimum
Pavement Subgrade	On-Site Granular Soils	95	Optimum
Pavement Aggregate Base	Class 2 Aggregate Base[3]	95	Optimum
Asphalt Concrete	Asphalt Concrete	95 (Marshall)	NA

1 – Relative compaction based on maximum density determined by ASTM D1557 (latest version)
2 – Moisture content based on optimum moisture content determined by ASTM D1557 (latest version)
3 – Class 2 aggregate base shall conform to Caltrans Standard Specifications, latest edition, except that the relative compaction should be determined by ASTM D1557 (latest version)
4 – Using light-weight compaction or walls should be braced

6.11.1 Construction Moisture Conditioning

The on-site sandy soils may dry out and ravel after initial compaction. The contractor should anticipate re-moisture conditioning (flooding is not recommended), or deep scarification, moisture conditioning, and re-compaction.

6.12 TRENCH BACKFILL

Pipeline lines constructed within public right-of-way should be trenched, bedded and shaded, and backfilled in accordance with the local or governing jurisdictional requirements (Marina Coast Water District Standard Plan, Standard Detail W-12), except as modified above. Utility lines in private improvement areas should be constructed in accordance with the following requirements unless superseded by other governing requirements.

Pipeline lines should be bedded and shaded to at least 12 inches over the top of the lines with crushed rock (⅜-inch-diameter or greater) or well-graded sand and gravel materials conforming to the pipe manufacturer's requirements. Open-graded shading materials should be consolidated in place with vibratory equipment and well-graded materials should be compacted to at least 95 percent relative compaction with vibratory equipment prior to placing subsequent backfill materials. Open-graded materials should be enclosed within filter fabric (Mirafi 140N or approved equivalent) to prevent migration of sand into the open graded material.

We recommend that trenches be excavated a minimum 12 inches beyond the outside of the pipe including bells. The pipe shading should be consolidated or compacted (depending on type of material) on the outside of the pipe in lifts to enable the material to be compacted under the pipe haunches.

General backfill over shading materials may consist of on-site native materials provided they meet the requirements in the "Material for Fill" section, and are moisture conditioned and compacted in accordance with the requirements in the "Compaction" section.

Where utility lines will cross perpendicular to strip footings, the footing should be deepened to encase the utility line, providing sleeves or flexible cushions to protect the pipes from anticipated foundation settlement, or the utility lines should be backfilled to the bottom of footing with sand-cement slurry or lean concrete. Where utility lines will parallel footings and will extend below the "foundation plane of influence," an imaginary 1:1 plane projected down from the bottom edge of the footing, either the footing will need to be deepened so that the pipe is above the foundation plane of influence or the utility trench will need to be backfilled with sand-cement slurry or lean concrete within the influence zone. Sand-cement slurry used within foundation influence zones should have a minimum compressive strength of 75 psi.

6.13 PERMANENT FILL SLOPES

Fill slopes should be overbuilt and trimmed back, exposing engineered fill when complete. Fill placed on existing ground inclined at 5:1 or greater should be benched into the existing slope and a keyway constructed at the toe of the fill. Benches and keyways should be angled slightly into the slope (minimum 2 percent inclination). Refer to the "Erosion Control" section of this report for a discussion regarding protection of slope surfaces.

6.14 SITE DRAINAGE

Ponding should not be allowed adjacent to tank and building foundations, slabs-on-grade, or pavements. Hardscape surfaces should slope at least 2 percent towards suitable discharge facilities; landscape areas should slope at least 3 percent. Roof runoff should be directed away from building areas in closed pipes to storm drain or other retention or detention areas. Landscape drainage such as drain inlets and storm water filtration and/or infiltration trenches should be provided to collect and transmit storm water runoff to project storm drains, and/or detention or retention facilities.

6.15 PERMANENT EROSION CONTROL MEASURES

Grading will require periodic maintenance after construction to reduce the potential for erosion and sloughing. At a minimum all slopes should be vegetated by hydroseeding or other landscape ground cover. The establishment of vegetation will help reduce runoff velocities, allow some infiltration and transpiration, trap sediment within runoff, and protect the soil from raindrop impact. Depending on the exposed material type and the slope inclination, more aggressive erosion control measures may be needed to protect slopes for one or more winter seasons while vegetation is establishing. This may consist of straw matting, or erosion control blankets used in combination with planting.

Both construction and post-construction Storm Water Pollution Prevention Plans (SWPPPs) should be prepared for the project-specific requirements. We recommend that final grading plans be provided for our review.

SECTION 7: FOUNDATIONS

7.1 SUMMARY OF RECOMMENDATIONS

In our opinion, the proposed reservoir tanks and booster pump station may be supported on shallow foundations provided anticipated settlements are tolerable and the recommendations in the "Earthwork" section and the sections below are followed.

7.2 AWWA SEISMIC DESIGN CRITERIA – RESERVOIR TANKS

The AWWA provides criteria for the seismic design of steel tanks in ANSI/AWWA D100-11 (2011). This standard indicates seismic design and parameters to be determined in accordance with procedures outline in ASCE 7-05. The "Seismic Coefficients" used to design tanks are established based on a series of tables and figures addressing different site factors, including the soil profile in the upper 100 feet below grade and mapped spectral acceleration parameters based on distance to the controlling seismic source/fault system. Based on our borings and our review of the local geology, the site is underlain by typical SPT "N" values between about 15 to 50 blows per foot. Therefore, we have classified the site as Soil Classification D. The mapped spectral acceleration parameters S_S and S_1 were calculated using the USGS web-based service provided at http://earthquake.usgs.gov/hazards/designmaps/usdesign.php (accessed on August 14, 2019), based on the site coordinates presented below and the site classification. The table below lists the various factors used to determine the seismic coefficients and other parameters.

Table 6: 2011 AWWA Site Categorization and Site Coefficients

Classification/Coefficient	Design Value
Site Class	D
Site Latitude	36.656597°
Site Longitude	-121.796108°
Risk Category	I to IV
0.2-second Period Mapped Spectral Acceleration[1], S_S	1.286g
1-second Period Mapped Spectral Acceleration[1], S_1	0.561g
Short-Period Site Coefficient – Fa	1.0
Long-Period Site Coefficient – Fv	1.5
0.2-second Period, Maximum Considered Earthquake Spectral Response Acceleration Adjusted for Site Effects - S_{MS}	1.286g
1-second Period, Maximum Considered Earthquake Spectral Response Acceleration Adjusted for Site Effects – S_{M1}	0.842g
0.2-second Period, Design Earthquake Spectral Response Acceleration – S_{DS}	0.857g
1-second Period, Design Earthquake Spectral Response Acceleration – S_{D1}	0.561g

[1]For Site Class B, 5 percent damped.

7.3 CBC SEISMIC DESIGN CRITERIA – BOOSTER PUMP STATION

We understand the project will be designed based on the 2019 California Building Code (CBC). Based on our review of the 2019 CBC, a site-specific hazard analysis in accordance with ASCE 7-16 Chapter 21 will be required. The analysis should be performed using the 2014 USGS fault model and the computer program, EZ-Frisk, that we have been using to perform the analysis has not been updated to incorporate the 2014 USGS fault model (UCERF3). We are in the process of reviewing and validating alternative software, but it is not ready to be implemented until early next year. Therefore, we have provided seismic coefficients based on the 2016 CBC below, but they are for reference only and **should not** be used for design if the project will be in accordance with the 2019 CBC. We should be further consulted regarding the 2019 CBC seismic coefficients before structural design is started. We will provide an update as our information and processes are developed.

The "Seismic Coefficients" used to design buildings are established based on a series of tables and figures addressing different site factors, including the soil profile in the upper 100 feet below grade and mapped spectral acceleration parameters based on distance to the controlling seismic source/fault system. Based on our borings and our review of the local geology, the site is underlain by typical SPT "N" values between about 15 to 50 blows per foot. Therefore, we have classified the site as Soil Classification D. The 2016 CBC mapped spectral acceleration parameters S_S and S_1 were calculated using the ASCE 7 web-based program *ASCE 7 Hazard Tool*, located at https://asce7hazardtool.online, 2017-2018, based on the site coordinates presented below and the site classification. The table below lists the various factors used to determine the seismic coefficients and other parameters.

Table 7: 2016 CBC Site Categorization and Site Coefficients

Classification/Coefficient	Design Value
Site Class	D
Site Latitude	36.656597°
Site Longitude	-121.796108°
0.2-second Period Mapped Spectral Acceleration[1], S_S	1.495 g
1-second Period Mapped Spectral Acceleration[1], S_1	0.535 g
Short-Period Site Coefficient – Fa	1.0
Long-Period Site Coefficient – Fv	1.5
0.2-second Period, Maximum Considered Earthquake Spectral Response Acceleration Adjusted for Site Effects - S_{MS}	1.495 g
1-second Period, Maximum Considered Earthquake Spectral Response Acceleration Adjusted for Site Effects – S_{M1}	0.802 g
0.2-second Period, Design Earthquake Spectral Response Acceleration – S_{DS}	0.997 g
1-second Period, Design Earthquake Spectral Response Acceleration – S_{D1}	0.535 g
Mapped MCE Geometric Mean Peak Ground Acceleration – PGA_M	0.562g
Site Coefficient Based on PGA and Site Class - F_{PGA}	1.0

[1]For Site Class B, 5 percent damped.

7.4 SHALLOW SPREAD FOOTING FOUNDATIONS – BOOSTER PUMP STATION

As discussed, we understand finished floor elevation for the pump station will be about Elevation 186 feet. Provided recommendations outlined in the "Earthwork" section of this report are followed, the booster pump station may be supported by shallow spread footings.

7.4.1 Spread Footings

Spread footings for the pump station should bear entirely on natural, undisturbed soil or engineered fill, be at least 15 inches wide, and extend at least 18 inches below lowest adjacent grade. Lowest adjacent grade is defined as the deeper of the following: 1) bottom of the adjacent interior slab-on-grade, or 2) finished exterior grade, excluding landscaping topsoil.

Footings constructed to the above dimensions and in accordance with the "Earthwork" recommendations of this report are capable of supporting maximum allowable bearing pressures of 2,500 psf for dead loads, 3,750 psf for combined dead plus live loads, and 5,000 psf for all loads including wind and seismic. These pressures are based on factors of safety of 3.0, 2.0, and 1.5 applied to the ultimate bearing pressure for dead, dead plus live, and all loads, respectively. These pressures are net values; the weight of the footing may be neglected for the portion of the footing extending below grade (typically, the full footing depth). Top and bottom mats of reinforcing steel should be included in continuous footings to help span irregularities and differential settlement.

7.4.2 Footing Settlement

Structural loads for the pump station were not provided to us at the time this report was prepared. Therefore, we have assumed a typical loading of 1 to 5 kips per lineal foot for continuous perimeter footings. Based on this loading and the allowable bearing pressures presented above, we estimate that the total static footing settlement will be on the order of ½-inch, with about ¼-inch of post-construction differential settlement between adjacent foundation elements. In addition, we estimate that differential seismic movement from dry sand shaking will be on the order of ¼ inch between independent foundation elements, resulting in a total estimated differential footing movement of up to ½-inch between independent foundation elements. We recommend we be retained to review the final footing layout and loading, and verify the settlement estimates above.

7.4.3 Lateral Loading

Lateral loads may be resisted by friction between the bottom of footing and the supporting subgrade, and also by passive pressures generated against footing sidewalls. An ultimate frictional resistance of 0.45 applied to the footing dead load, and an ultimate passive pressure based on an equivalent fluid pressure of 400 pcf may be used in design. The structural engineer should apply an appropriate factor of safety (such as 1.5) to the ultimate values above. Where footings are adjacent to landscape areas without hardscape, the upper 12 inches of soil should be neglected when determining passive pressure capacity.

7.4.4 Spread Footing Construction Considerations

Where utility lines will cross perpendicular to strip footings, the footing should be deepened to encase the utility line, providing sleeves or flexible cushions to protect the pipes from anticipated foundation settlement, or the utility lines should be backfilled to the bottom of footing with sand-cement slurry or lean concrete. Where utility lines will parallel footings and will extend below the "foundation plane of influence," an imaginary 1:1 plane projected down from the bottom edge of the footing, either the footing will need to be deepened so that the pipe is above the foundation plane of influence or the utility trench will need to be backfilled with sand-cement slurry or lean concrete within the influence zone. Sand-cement slurry used within foundation influence zones should have a minimum compressive strength of 75 psi.

Footing excavations should be filled as soon as possible or be kept moist until concrete placement by regular sprinkling to prevent desiccation. Additionally, the footings will be in sands with low fines content and will likely slough and not stand vertical. Excavation sidewalls may need to be sloped to a minimum 1.5:1 (horizontal:vertical) inclination where footings or Stay-Form or similar may need to be placed within footing excavations as they are excavated during construction of the foundation elements. In addition, depending on how the excavations are cut, if the footing subgrade is loosened, the footing bottoms will need to be re-compacted in place. A Cornerstone representative should observe all footing excavations prior to placing reinforcing steel and concrete. If there is a significant schedule delay between our initial observation and concrete placement, we may need to re-observe the excavations.

7.5 SHALLOW RING AND SPREAD FOOTING FOUNDATIONS – RESERVOIR TANKS

Provided the reservoir tanks can tolerate the anticipated settlements discussed below, the tank ring foundations and center column foundation can be supported by shallow ring and spread footing foundations.

7.5.1 Ring and Spread Footings

The ring and spread footings should bear entirely on properly prepared subgrade in accordance with the "Earthwork" section of this report, be at least 12 inches wide, and extend at least 24 inches below the lowest adjacent grade. Bottom of footing is based on lowest adjacent grade, defined as the deeper of the following: 1) bottom of the tank subgrade, or 2) finished exterior grade, excluding landscaping topsoil.

Footings constructed to the above dimensions and in accordance with the "Earthwork" recommendations of this report are capable of supporting maximum allowable bearing pressures of 3,000 psf for combined dead plus live loads, and 4,000 psf for all loads including wind and seismic. These pressures are based on factors of safety of 2.0 and 1.5 applied to the ultimate bearing pressure for dead, dead plus live, and all loads, respectively. These pressures are net values; the weight of the footing may be neglected for the portion of the footing extending below grade (typically, the full footing depth). Top and bottom mats of reinforcing steel should be included in continuous footings to help span irregularities and differential settlement.

7.5.2 Ring and Spread Footing Settlement

Structural loads for the reservoir tanks were not finalized at the time this report was prepared. Based on the tank size and capacity, we estimate the tank will exert an areal pressure of about 2,000 psf on the soil subgrade when filled with water.

Based on this loading and the allowable bearing pressures presented above, we estimate that the total static settlement will be on the order of 2 to 2¼ inches, with post-construction differential settlement of about 1 to 1¼ inches over a horizontal distance of 50 feet. In addition, we estimate that differential seismic movement from dry sand shaking will be on the order of ½ inch between independent foundation elements, resulting in a total estimated differential movement on the order of 1¾ to 2 inches between independent foundation elements, or a horizontal distance of 50 feet. We recommend we be retained to review the final footing layout and loading, and verify the settlement estimates above.

As mentioned, based on our discussions with you, we understand the tanks can be designed for and accommodate the anticipated settlements discussed above. If it is determined the tanks are not able to be designed for the above settlements, additional recommendations and an alternative foundation will be required.

7.5.3 Lateral Loading

Lateral loads may be resisted by friction between the bottom of footing and the supporting subgrade, and also by passive pressures generated against footing sidewalls. An ultimate frictional resistance of 0.45 applied to the footing dead load, and an ultimate passive pressure based on an equivalent fluid pressure of 400 pcf may be used in design. The structural engineer should apply an appropriate factor of safety (such as 1.5) to the ultimate values above. The upper 12 inches of footing embedment should be neglected for passive resistance for exterior footings unless the perimeter of the tank is paved.

7.5.4 Oiled Sand Cushion

As discussed, we understand the steel bottom of the tanks between the ring foundation and center column foundation will be supported directly on the subgrade soils beneath. We also understand a 6-inch oiled sand cushion will be placed between the subgrade and tank bottom. The 6-inch oiled sand cushion should be placed and compacted on the subgrade prepared in accordance with the "Earthwork" recommendations of this report. The oiled sand cushion should be compacted to a minimum 95 percent relative compaction as outlined in the "Compaction" section of this report and should be designed in accordance with AWWA D100-11 requirements.

7.5.5 Ring and Spread Footing Foundation Construction Considerations

Where utility lines cross perpendicular to the ring foundation footings, the footing should be deepened to encase the utility line, providing sleeves or flexible cushions to protect the pipes from anticipated foundation settlement, or the utility lines should be backfilled to the bottom of footing with sand-cement slurry or lean concrete. Where utility lines parallel footings and will extend below the "foundation plane of influence," an imaginary 1:1 plane projected down from the bottom edge of the footing, either the footing will need to be deepened so that the pipe is above the foundation plane of influence or the utility trench will need to be backfilled with sand-cement slurry or lean concrete within the influence zone. Sand-cement slurry used within foundation influence zones should have a minimum compressive strength of 75 psi.

Footing excavations should be filled as soon as possible or be kept moist until concrete placement by regular sprinkling to prevent desiccation. Additionally, the footings will be in sands with low fines content and will likely slough and not stand vertical. Excavation sidewalls may need to be sloped to a minimum 1.5:1 (horizontal:vertical) inclination where footings or Stay-Form or similar may need to be placed within footing excavations as they are excavated during construction of the foundation elements. In addition, depending on how the excavations are cut, if the footing subgrade is loosened, the footing bottoms will need to be re-compacted in place. A Cornerstone representative should observe all footing excavations prior to placing reinforcing steel and concrete. If there is a significant schedule delay between our initial observation and concrete placement, we may need to re-observe the excavations.

SECTION 8: CONCRETE SLABS AND PEDESTRIAN PAVEMENTS

8.1 PUMP STATION SLABS-ON-GRADE

The pump station slabs-on-grade should be at least 4 inches thick and may be supported directly on compacted subgrade prepared in accordance with the "Earthwork" recommendations of this report. If moisture-sensitive floor coverings are planned, the recommendations in the "Pump Station Interior Slabs Moisture Protection Considerations" section below may be incorporated in the project design if desired. If significant time elapses between initial subgrade preparation and slab-on-grade construction, the subgrade should be proof-rolled to confirm subgrade stability, and if the soil has been allowed to dry out, the subgrade should be re-moisture conditioned to at least the optimum moisture content. Consideration of limiting the control joint spacing to a maximum of about 2 feet in each direction for each inch of concrete thickness. We recommend that pump station slabs be isolated from the perimeter footings.

8.2 PUMP STATION INTERIOR SLABS MOISTURE PROTECTION CONSIDERATIONS

The following general guidelines for concrete slab-on-grade construction where floor coverings are planned are presented for the consideration by the developer, design team, and contractor. These guidelines are based on information obtained from a variety of sources, including the American Concrete Institute (ACI) and are intended to reduce the potential for moisture-related problems causing floor covering failures, and may be supplemented as necessary based on project-specific requirements. The application of these guidelines or not will not affect the geotechnical aspects of the slab-on-grade performance.

- Place a minimum 10-mil vapor retarder conforming to ASTM E 1745, Class C requirements or better directly below the concrete slab; the vapor retarder should extend to the slab edges and be sealed at all seams and penetrations in accordance with manufacturer's recommendations and ASTM E 1643 requirements. A 4-inch-thick capillary break, consisting of crushed rock should be placed below the vapor retarder and consolidated in place with vibratory equipment. The mineral aggregate shall be of such size that the percentage composition by dry weight as determined by laboratory sieves will conform to the following gradation:

Sieve Size	Percentage Passing Sieve
1"	100
¾"	90 – 100
No. 4	0 - 10

- The concrete water:cement ratio should be 0.45 or less. Mid-range plasticizers may be used to increase concrete workability and facilitate pumping and placement.

- Water should not be added after initial batching unless the slump is less than specified and/or the resulting water:cement ratio will not exceed 0.45.

- Polishing the concrete surface with metal trowels is not recommended.

- Where floor coverings are planned, all concrete surfaces should be properly cured.
- Water vapor emission levels and concrete pH should be determined in accordance with ASTM F1869-98 and F710-98 requirements and evaluated against the floor covering manufacturer's requirements prior to installation.

8.3 EXTERIOR FLATWORK

Exterior concrete flatwork subject to pedestrian traffic only should be at least 4 inches thick and supported on compacted subgrade prepared in accordance with the "Earthwork" recommendations of this report. Flatwork that will be subject to heavier or frequent vehicular loading should be designed in accordance with the recommendations in the "Vehicular Pavements" section below. To help reduce the potential for uncontrolled shrinkage cracking, adequate expansion and control joints should be included. Consideration should be given to limiting the control joint spacing to a maximum of about 2 feet in each direction for each inch of concrete thickness. Flatwork should be isolated from adjacent foundations or retaining walls.

SECTION 9: VEHICULAR PAVEMENTS

9.1 ASPHALT CONCRETE

The following asphalt concrete pavement recommendations tabulated below are based on the Procedure 608 of the Caltrans Highway Design Manual, estimated traffic indices for various pavement-loading conditions, and on a design R-value of 20. The design R-value was chosen based on our engineering judgement considering the soil type and variable surface conditions.

Table 8: Asphalt Concrete Pavement Recommendations, Design R-value = 20

Design Traffic Index (TI)	Asphalt Concrete (inches)	Class 2 Aggregate Base* (inches)	Total Pavement Section Thickness (inches)
4.0	2.5	5.5	8.0
4.5	2.5	7.0	9.5
5.0	3.0	7.0	10.0
5.5	3.0	9.0	12.0
6.0	3.5	9.5	13.0
6.5	4.0	10.5	14.5

*Caltrans Class 2 aggregate base; minimum R-value of 78

Frequently, the full asphalt concrete section is not constructed prior to construction traffic loading. This can result in significant loss of asphalt concrete layer life, rutting, or other pavement failures. To improve the pavement life and reduce the potential for pavement distress through construction, we recommend the full design asphalt concrete section be constructed

prior to construction traffic loading. Alternatively, a higher traffic index may be chosen for the areas where construction traffic will be using the pavements.

9.2 PORTLAND CEMENT CONCRETE DRIVEWAYS

The exterior Portland Cement Concrete (PCC) pavement recommendations tabulated below are based on methods presented in the Portland Cement Association (PCA) design manual (PCA, 1984). We have provided a few pavement alternatives as an anticipated Average Daily Truck Traffic (ADTT) was not provided. An allowable ADTT should be chosen that is greater than what is expected for the development.

Table 9: PCC Pavement Recommendations, Design R-value = 20

Allowable ADTT	Minimum PCC Thickness (inches)
4	5.0
57	5.5
480	6.0

The PCC thicknesses above are based on a concrete compressive strength of at least 3,500 psi, supporting the PCC on at least 6 inches of Class 2 aggregate base compacted as recommended in the "Earthwork" section, and laterally restraining the PCC with curbs or concrete shoulders. Adequate expansion and control joints should be included. Consideration should be given to limiting the control joint spacing to a maximum of about 2 feet in each direction for each inch of concrete thickness.

SECTION 10: RETAINING WALLS

10.1 STATIC LATERAL EARTH PRESSURES

The structural design of any site retaining wall should include resistance to lateral earth pressures that develop from the soil behind the wall, any undrained water pressure, and surcharge loads acting behind the wall. Provided a drainage system is constructed behind the wall to prevent the build-up of hydrostatic pressures as discussed in the section below, we recommend that the walls with level backfill be designed for the following pressures:

Table 10: Recommended Lateral Earth Pressures

Wall Condition	Lateral Earth Pressure*	Additional Surcharge Loads
Unrestrained – Cantilever Wall	35 pcf	⅓ of vertical loads at top of wall
Restrained – Braced Wall	35 pcf + 8H** psf	½ of vertical loads at top of wall

* Lateral earth pressures are based on an equivalent fluid pressure for level backfill conditions
** H is the distance in feet between the bottom of footing and top of retained soil

The below-grade walls for the pump station should be designed as restrained walls. If adequate drainage cannot be provided behind the wall, an additional equivalent fluid pressure of 40 pcf should be added to the values above for both restrained and unrestrained walls for the portion of the wall that will not have drainage. Damp proofing or waterproofing of the walls may be considered where moisture penetration and/or efflorescence are not desired.

10.1.1 Surcharge Loading on Pump Station South Wall from Reservoir Tank

Based on the site plan provided, the northern reservoir tank is about 30 feet south of the southern wall for the pump station. Additionally, we understand the reservoir tanks are currently to hold about 2 million gallons of water. Based on a 2-million-gallon tank size, we estimate an approximate 2,000 pounds per square foot (psf) areal pressure beneath the tanks. With this areal pressure, current layout of the tanks and pump station, bottom of tank elevation at Elevation 199 feet, top of pump station elevation at Elevation 199 feet, and pump station finished floor elevation of Elevation 186 feet, the pump station southern wall will be subjected to addition surcharge loading from the northern reservoir tank. Based on the above understanding and assumptions, we recommend the pump station southern wall be designed for an additional 20 psf surcharge load in the upper 5 feet of the wall (Elevation 194 to 199 feet), an additional 50 psf surcharge load at a depth of 5 to 10 feet (Elevation 189 to 194 feet), and an additional 75 psf surcharge load below a depth of 10 feet (Elevation 189 feet). We recommend we be retained to review the final site layout and tank loading, and verify the surcharge loading.

10.2 SEISMIC LATERAL EARTH PRESSURES

The 2019 California Building Code (CBC) states that lateral pressures from earthquakes should be considered in the design of basements and retaining walls. We developed seismic earth pressures for the proposed below-grade pump station walls using interim recommendations generally based on refinement of the Mononobe-Okabe method (Lew et al., SEAOC 2010). Because the walls are greater than 12 feet in height, and peak ground accelerations are greater than 0.40g, we checked the result of the seismic increment when added to the recommended active earth pressure against the recommended fixed wall earth pressures. The below-grade pump station walls will not be free to deflect, and should therefore be designed for static conditions as a restrained wall, which is also a CBC requirement. Based on current recommendations for seismic earth pressures, it appears that active earth pressures plus a seismic increment exceed the restrained (i.e. at-rest), static wall earth pressures. Therefore, we recommend checking the walls for the seismic condition in accordance with the interim recommendations of the above referenced paper and the 2019 CBC.

The CBC prescribes basic load combinations for structures, components and foundations with the intention that their design strength equals or exceeds the effects of the factored loads. With respect to the load from lateral earth pressure and groundwater pressure, the CBC prescribes the basic combinations shown in CBC equations 16-2 and 16-7 below.

$1.2(D + F) + 1.6(L + H) + 0.5(L_r \text{ or } S \text{ or } R)$ [Eq. 16-2]

In Eq. 16-2: H - should represent the total static lateral earth pressure, which for the basement wall will be restrained (use 35 pcf + 8H psf)

$0.9(D + F) + 1.0E + 1.6H$ [Eq. 16-7]

In Eq. 16-7: H - should represent the static “active” earth pressure component under seismic loading conditions (use 35 pcf)

E - should represent the seismic increment component in Eq. 16-7, a triangular load with a resultant force of $5H^2$, which should be applied one third of the height up from the base of the wall (and which can also be expressed as an equivalent fluid pressure equal to 10 pcf).

The interim recommendations in the SEAOC paper more appropriately split out "active" earth pressure (and not the restrained ["at-rest"] pressure) from our report and provide the total seismic increment so that different load factors can be applied in accordance with different risk levels.

10.3 WALL DRAINAGE

10.3.1 At-Grade Site Walls

Adequate drainage should be provided by a subdrain system behind all walls. This system should consist of a 4-inch minimum diameter perforated pipe placed near the base of the wall (perforations placed downward). The pipe should be bedded and backfilled with Class 2 Permeable Material per Caltrans Standard Specifications, latest edition. The permeable backfill should extend at least 12 inches out from the wall and to within 2 feet of outside finished grade. Alternatively, ½-inch to ¾-inch crushed rock may be used in place of the Class 2 Permeable Material provided the crushed rock and pipe are enclosed in filter fabric, such as Mirafi 140N or approved equivalent. The upper 2 feet of wall backfill should consist of compacted on-site soil. The subdrain outlet should be connected to a free-draining outlet or sump.

Miradrain, Geotech Drainage Panels, or equivalent drainage matting can be used for wall drainage as an alternative to the Class 2 Permeable Material or drain rock backfill. Horizontal strip drains connecting to the vertical drainage matting may be used in lieu of the perforated pipe and crushed rock section. The vertical drainage panel should be connected to the perforated pipe or horizontal drainage strip at the base of the wall, or to some other closed or through-wall system such as the TotalDrain system from AmerDrain. Sections of horizontal drainage strips should be connected with either the manufacturer’s connector pieces or by pulling back the filter fabric, overlapping the panel dimples, and replacing the filter fabric over the connection. At corners, a corner guard, corner connection insert, or a section of crushed rock covered with filter fabric must be used to maintain the drainage path.

Drainage panels should terminate 18 to 24 inches from final exterior grade. The Miradrain panel filter fabric should be extended over the top of and behind the panel to protect it from intrusion of the adjacent soil.

10.3.2 Below-Grade Walls

Miradrain, AmerDrain or other equivalent drainage matting should be used for wall drainage where below-grade walls are temporarily shored and the shoring will be flush with the back of the permanent walls. The drainage panel should be connected at the base of the wall by a horizontal drainage strip and closed or through-wall system such as the TotalDrain system from AmerDrain.

Sections of horizontal drainage strips should be connected with either the manufacturer's connector pieces or by pulling back the filter fabric, overlapping the panel dimples, and replacing the filter fabric over the connection. At corners, a corner guard, corner connection insert, or a section of crushed rock covered with filter fabric must be used to maintain the drainage path.

Drainage panels should terminate 18 to 24 inches from final exterior grade unless capped by hardscape. The drainage panel filter fabric should be extended over the top of and behind the panel to protect it from intrusion of the adjacent soil. If the shoring system will be offset behind the back of permanent wall, the drainage systems discussed in the "At-Grade Site Walls" section may also be used.

10.4 BACKFILL

Where surface improvements will be located over the retaining wall backfill, backfill placed behind the walls should be compacted to at least 95 percent relative compaction using light compaction equipment. Where no surface improvements are planned, backfill should be compacted to at least 90 percent. If heavy compaction equipment is used, the walls should be temporarily braced.

Consideration should be given to the transitions from on-grade to on-structure. Subslabs or other methods for reducing differential movement of flatwork or pavements across this transition should be included in the project design.

10.5 FOUNDATIONS

Retaining walls for the pump station building may be supported on a continuous spread footing designed in accordance with the recommendations presented in the "Foundations" section of this report.

At this time, we are not aware of other retaining walls for the project. If other site retaining walls are proposed, we should be consulted to provide additional recommendations as recommendations may vary based on location due to the potential for undocumented fills and loose to medium dense native soils with the potential for dry sand seismic settlements.

SECTION 11: LIMITATIONS

This report, an instrument of professional service, has been prepared for the sole use of Schaaf and Wheeler specifically to support the design of the MCWD A1/A2 Reservoirs and B/C Booster Pump Station project in Marina, California. The opinions, conclusions, and recommendations presented in this report have been formulated in accordance with accepted geotechnical engineering practices that exist in Northern California at the time this report was prepared. No warranty, expressed or implied, is made or should be inferred.

Recommendations in this report are based upon the soil and groundwater conditions encountered during our subsurface exploration. If variations or unsuitable conditions are encountered during construction, Cornerstone must be contacted to provide supplemental recommendations, as needed.

Schaaf and Wheeler may have provided Cornerstone with plans, reports and other documents prepared by others. Schaaf and Wheeler understands that Cornerstone reviewed and relied on the information presented in these documents and cannot be responsible for their accuracy.

Cornerstone prepared this report with the understanding that it is the responsibility of the owner or his representatives to see that the recommendations contained in this report are presented to other members of the design team and incorporated into the project plans and specifications, and that appropriate actions are taken to implement the geotechnical recommendations during construction.

Conclusions and recommendations presented in this report are valid as of the present time for the development as currently planned. Changes in the condition of the property or adjacent properties may occur with the passage of time, whether by natural processes or the acts of other persons. In addition, changes in applicable or appropriate standards may occur through legislation or the broadening of knowledge. Therefore, the conclusions and recommendations presented in this report may be invalidated, wholly or in part, by changes beyond Cornerstone's control. This report should be reviewed by Cornerstone after a period of three (3) years has elapsed from the date of this report. In addition, if the current project design is changed, then Cornerstone must review the proposed changes and provide supplemental recommendations, as needed.

An electronic transmission of this report may also have been issued. While Cornerstone has taken precautions to produce a complete and secure electronic transmission, please check the electronic transmission against the hard copy version for conformity.

Recommendations provided in this report are based on the assumption that Cornerstone will be retained to provide observation and testing services during construction to confirm that conditions are similar to that assumed for design, and to form an opinion as to whether the work has been performed in accordance with the project plans and specifications. If we are not retained for these services, Cornerstone cannot assume any responsibility for any potential claims that may arise during or after construction as a result of misuse or misinterpretation of

Cornerstone's report by others. Furthermore, Cornerstone will cease to be the Geotechnical-Engineer-of-Record if we are not retained for these services.

SECTION 12: REFERENCES

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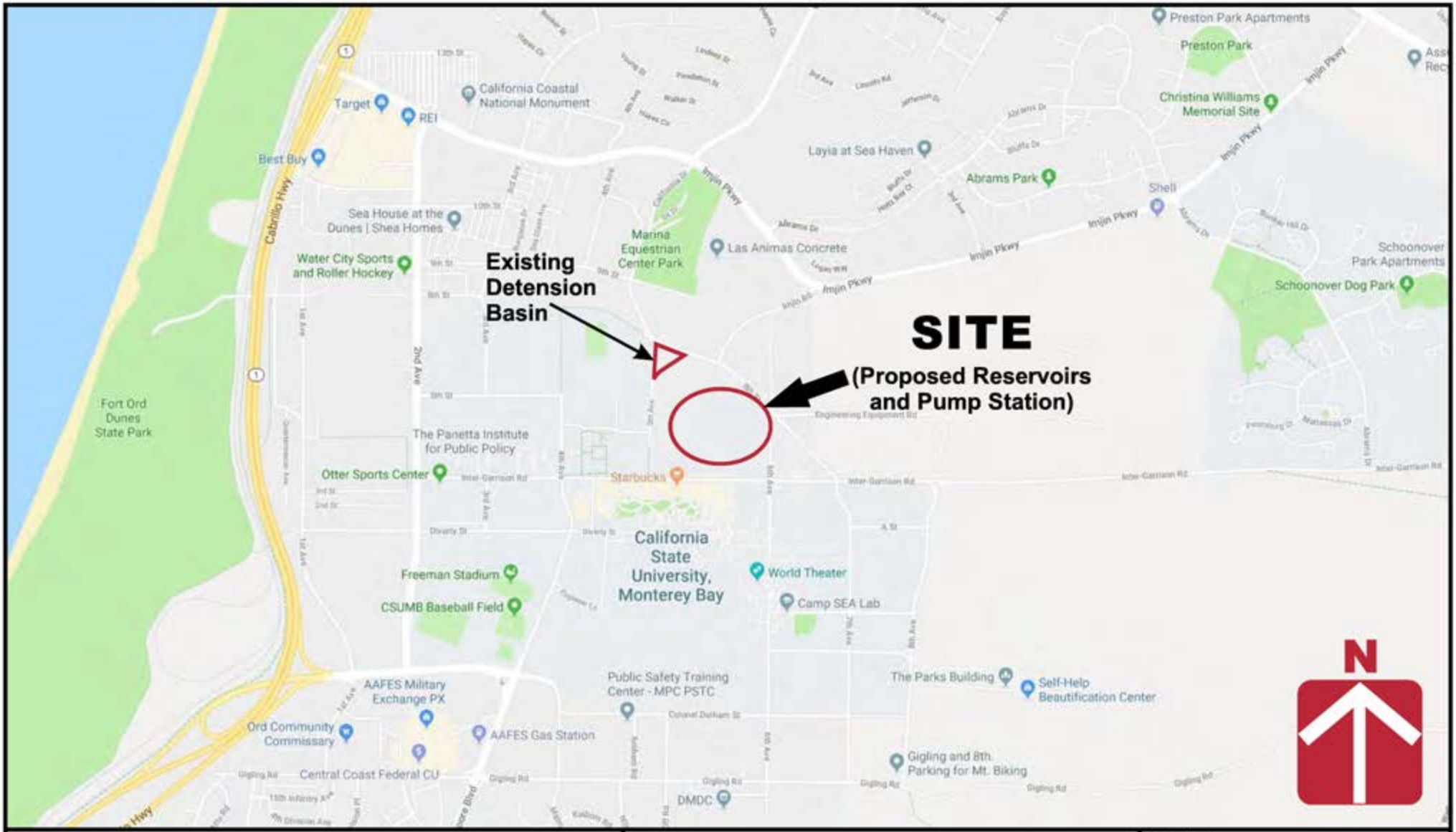

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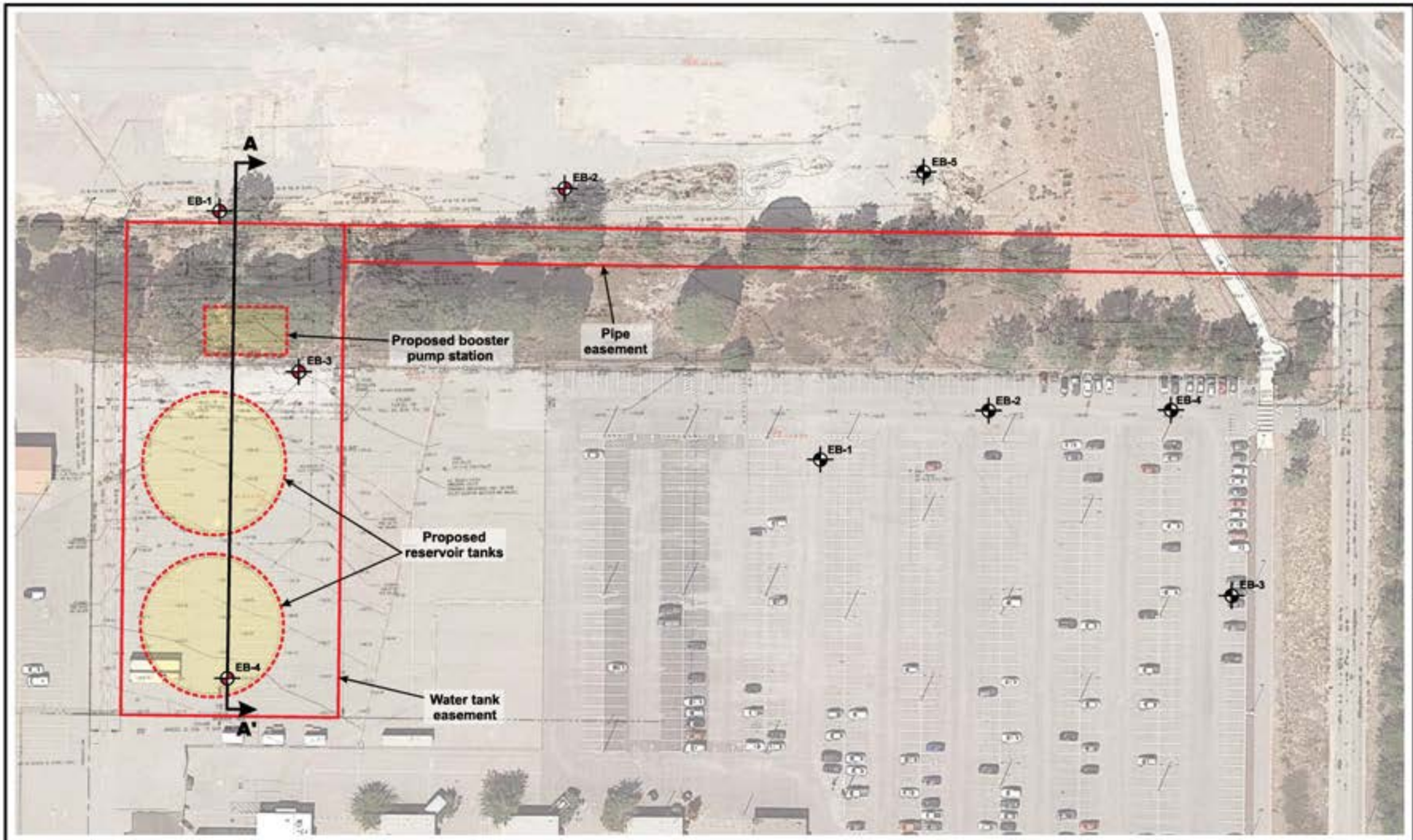
Vicinity Map

MCWD A1/A2 Reservoirs and B/C Booster Pump Station Marina, CA

Project Number	187-55-1
Figure Number	Figure 1
Date	August 2019
Drawn By	RRN



Legend

- Approximate location of exploratory boring (EB)
- Approximate location of exploratory boring (EB) (Cornerstone, 2007)
- A A' Approximate location of cross section

N

0 80 160

APPROXIMATE SCALE (FEET)

Base by Google Earth, dated 9/14/2018
Overlays by Whitson Engineers, Marina Coast Water District 'A' Reservoirs Proposed Tank Site & Pipeline Alignment - Sheet 1, dated 7/3/2019,
Whitson Engineers, Marina Coast Water District 'A' Reservoirs Proposed Tank Site & Pipeline Alignment - Sheet 2, dated 7/3/2019,
Schaaf & Wheeler, A1/A2 Reservoirs and B/C Booster Pump Station, Conceptual Site Plan, dated 7/12/2019

Project Number 187-55-1
Figure Number Figure 2
Date August 2019
Drawn By RRN

Site Plan

MCWD A1/A2 Reservoirs and B/C Booster Pump Station Marina, CA

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Base by California Geological Survey - 2010 Fault Activity Map of California (Jennings and Bryant, 2010)

Regional Fault Map

MCWD A1/A2 Reservoirs and B/C Booster Pump Station
Marina, CA

Project Number: 187-55-1
Figure Number: Figure 3
Date: August 2019
Drawn by: RRN

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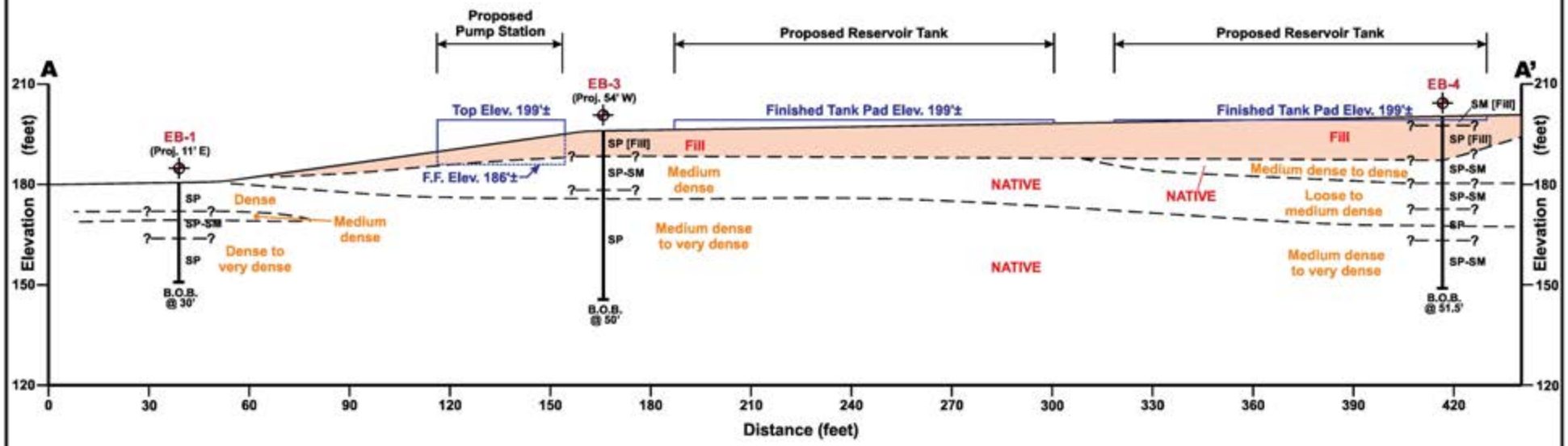

Section A-A'

(View Looking East)
1"=30' H:V

Symbols

SP	Poorly Graded Sand
SM	Silty Sand
SP-SM	Poorly Graded Sand with Silt
⌖	Approximate location of exploratory boring (EB)

Notes:
1) Surficial fills associated with existing pavements, landscaping or utilities are not shown.
2) The subsurface profile is conceptual and is based on limited subsurface data obtained from widely spaced borings. Actual subsurface conditions may vary significantly between borings.
3) See Figure 2 for location of cross section.
4) Referenced elevations based on NAVD88 datum.

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Cross Section A-A'

MCWD A1/A2 Reservoirs and
B/C Booster Pump Station
Marina, CA

Project Number	187-55-1
Figure Number	Figure 4
Date	August 2019
Drawn By	RRN

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Existing Detention Basin - Infiltration Testing Location

MCWD A1/A2 Reservoirs and B/C Booster Pump Station Marina, CA

Project Number	187-55-1
Figure Number	Figure 5
Date	August 2019
Drawn By	RRN

APPENDIX A: FIELD INVESTIGATION

The field investigation consisted of a surface reconnaissance and a subsurface exploration program using truck-mounted, hollow-stem auger drilling equipment. Four 8-inch-diameter exploratory borings were drilled on June 26, 2019 to depths ranging from 21½ to 51½ feet. The approximate locations of exploratory borings are shown on the Site Plan, Figure 2. The soils encountered were continuously logged in the field by our representative and described in accordance with the Unified Soil Classification System (ASTM D2488). Boring logs, as well as a key to the classification of the soil, are included as part of this appendix.

Boring locations were approximated using existing site boundaries, a hand held GPS unit, and other site features as references. Boring elevations were estimated based on the topographic map provided by Whitson Engineers. The locations and elevations of the borings should be considered accurate only to the degree implied by the method used.

Representative soil samples were obtained from the borings at selected depths. All samples were returned to our laboratory for evaluation and appropriate testing. The standard penetration resistance blow counts were obtained by dropping a 140-pound hammer through a 30-inch free fall. The 2-inch O.D. split-spoon sampler was driven 18 inches and the number of blows was recorded for each 6 inches of penetration (ASTM D1586). 2.5-inch I.D. samples were obtained using a Modified California Sampler driven into the soil with the 140-pound hammer previously described. Unless otherwise indicated, the blows per foot recorded on the boring log represent the accumulated number of blows required to drive the last 12 inches. The various samplers are denoted at the appropriate depth on the boring logs.

Attached boring logs and related information depict subsurface conditions at the locations indicated and on the date designated on the logs. Subsurface conditions at other locations may differ from conditions occurring at these boring locations. The passage of time may result in altered subsurface conditions due to environmental changes. In addition, any stratification lines on the logs represent the approximate boundary between soil types and the transition may be gradual.

UNIFIED SOIL CLASSIFICATION (ASTM D-2487-10)

MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES			GROUP SYMBOL	SOIL GROUP NAMES & LEGEND
COARSE-GRAINED SOILS >50% RETAINED ON NO. 200 SIEVE	GRAVELS >50% OF COARSE FRACTION RETAINED ON NO 4. SIEVE	CLEAN GRAVELS <5% FINES	Cu>4 AND 1<Cc<3	GW	WELL-GRADED GRAVEL
			Cu>4 AND 1>Cc>3	GP	POORLY-GRADED GRAVEL
		GRAVELS WITH FINES >12% FINES	FINES CLASSIFY AS ML OR CL	GM	SILTY GRAVEL
			FINES CLASSIFY AS CL OR CH	GC	CLAYEY GRAVEL
	SANDS >50% OF COARSE FRACTION PASSES ON NO 4. SIEVE	CLEAN SANDS <5% FINES	Cu>6 AND 1<Cc<3	SW	WELL-GRADED SAND
			Cu>6 AND 1>Cc>3	SP	POORLY-GRADED SAND
		SANDS AND FINES >12% FINES	FINES CLASSIFY AS ML OR CL	SM	SILTY SAND
			FINES CLASSIFY AS CL OR CH	SC	CLAYEY SAND
FINE-GRAINED SOILS >50% PASSES NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT<50	INORGANIC	PI>7 AND PLOTS>"A" LINE	CL	LEAN CLAY
			PI>4 AND PLOTS<"A" LINE	ML	SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OL	ORGANIC CLAY OR SILT
	SILTS AND CLAYS LIQUID LIMIT>50	INORGANIC	PI PLOTS >"A" LINE	CH	FAT CLAY
			PI PLOTS <"A" LINE	MH	ELASTIC SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OH	ORGANIC CLAY OR SILT
HIGHLY ORGANIC SOILS		PRIMARILY ORGANIC MATTER, DARK IN COLOR, AND ORGANIC ODOR		PT	PEAT

OTHER MATERIAL SYMBOLS

- Poorly-Graded Sand with Clay
- Clayey Sand
- Sandy Silt
- Artificial/Undocumented Fill
- Poorly-Graded Gravelly Sand
- Topsoil
- Well-Graded Gravel with Clay
- Well-Graded Gravel with Silt
- Sand
- Silt
- Well Graded Gravelly Sand
- Gravelly Silt
- Asphalt
- Boulders and Cobble

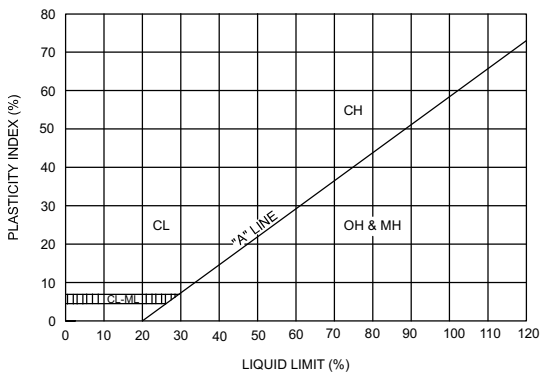
SAMPLER TYPES

- SPT
- Modified California (2.5" I.D.)
- Rock Core
- Shelby Tube
- No Recovery
- Grab Sample

ADDITIONAL TESTS

CA	-	CHEMICAL ANALYSIS (CORROSIVITY)	PI	-	PLASTICITY INDEX
CD	-	CONSOLIDATED DRAINED TRIAXIAL	SW	-	SWELL TEST
CN	-	CONSOLIDATION	TC	-	CYCLIC TRIAXIAL
CU	-	CONSOLIDATED UNDRAINED TRIAXIAL	TV	-	TORVANE SHEAR
DS	-	DIRECT SHEAR	UC	-	UNCONFINED COMPRESSION
PP	-	POCKET PENETROMETER (TSF)	(1.5)	-	(WITH SHEAR STRENGTH IN KSF)
(3.0)	-	(WITH SHEAR STRENGTH IN KSF)			
RV	-	R-VALUE	UU	-	UNCONSOLIDATED UNDRAINED TRIAXIAL
SA	-	SIEVE ANALYSIS: % PASSING #200 SIEVE			
▼	-	WATER LEVEL			

PLASTICITY CHART



PENETRATION RESISTANCE
(RECORDED AS BLOWS / FOOT)

SAND & GRAVEL		SILT & CLAY		
RELATIVE DENSITY	BLOWS/FOOT*	CONSISTENCY	BLOWS/FOOT*	STRENGTH** (KSF)
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 0.25
LOOSE	4 - 10	SOFT	2 - 4	0.25 - 0.5
MEDIUM DENSE	10 - 30	MEDIUM STIFF	4 - 8	0.5-1.0
DENSE	30 - 50	STIFF	8 - 15	1.0 - 2.0
VERY DENSE	OVER 50	VERY STIFF	15 - 30	2.0 - 4.0
		HARD	OVER 30	OVER 4.0

* NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT-BARREL SAMPLER THE LAST 12 INCHES OF AN 18-INCH DRIVE (ASTM-1586 STANDARD PENETRATION TEST).

** UNDRAINED SHEAR STRENGTH IN KIPS/SQ. FT. AS DETERMINED BY LABORATORY TESTING OR APPROXIMATED BY THE STANDARD PENETRATION TEST, POCKET PENETROMETER, TORVANE, OR VISUAL OBSERVATION.

CORNERSTONE EARTH GROUP

LEGEND TO SOIL DESCRIPTIONS

Figure Number A-1

BORING NUMBER EB-1

CORNERSTONE EARTH GROUP

PROJECT NAME MCWD A1/A2 Reservoirs & B/C Booster Pump Station
PROJECT NUMBER 187-55-1
PROJECT LOCATION 8th Street and 6th Avenue, Marina, CA
DATE STARTED 6/26/19 DATE COMPLETED 6/26/19
GROUND ELEVATION 180.5 FT +/- BORING DEPTH 30 ft.
DRILLING CONTRACTOR Exploration Geoservices, Inc.
LATITUDE 36.656840° LONGITUDE -121.796500°
DRILLING METHOD Mobile B-56, 8 inch Hollow-Stem Auger
GROUNDWATER LEVELS:
LOGGED BY JLC
AT TIME OF DRILLING Not Encountered
NOTES
AT END OF DRILLING Not Encountered

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE
180.5	0	2 inches asphalt concrete over 4 inches aggregate base						
180.0		**Poorly Graded Sand (SP)** dense, moist, yellowish brown, fine sand	63	MC-1B	104	5		
			46	SPT				
	5		64	MC-3B	101	3		1
			39	SPT				
171.5		**Poorly Graded Sand with Silt (SP-SM)** medium dense, moist, yellowish brown to brown, fine sand	46	MC-5B	104	7		
	10	becomes dense	35	SPT				
			32	SPT-7		13		
	15		36	SPT				
163.5		**Poorly Graded Sand (SP)** very dense, moist, light brown, fine sand	72	SPT-9		4		
	20							
			59	SPT-10		4		
	25							
			72	SPT				
150.5	30	Bottom of Boring at 30.0 feet.						

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0

CORNERSTONE EARTH GROUP2 - CORNERSTONE 0812.GDT - 8/19/19 08:41 - P:\DRAFTING\GINT FILES\187-55-1 MARINA PUMP STATION.GPJ

BORING NUMBER EB-2

CORNERSTONE EARTH GROUP

PROJECT NAME MCWD A1/A2 Reservoirs & B/C Booster Pump Station
PROJECT NUMBER 187-55-1
PROJECT LOCATION 8th Street and 6th Avenue, Marina, CA
DATE STARTED 6/26/19 DATE COMPLETED 6/26/19
GROUND ELEVATION 182.5 FT +/- BORING DEPTH 21.5 ft.
DRILLING CONTRACTOR Exploration Geoservices, Inc. LATITUDE 36.656867° LONGITUDE -121.795550°
DRILLING METHOD Mobile B-56, 8 inch Hollow-Stem Auger GROUNDWATER LEVELS:
LOGGED BY JLC AT TIME OF DRILLING Not Encountered
NOTES AT END OF DRILLING Not Encountered

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ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE
182.5	0		3 inches asphalt concrete over 4 inches aggregate base						
182.3									
181.9			**Poorly Graded Sand (SP)** dense, moist, yellowish brown, fine sand	22	SPT-1		7		
				42	MC-2B	103	5		1
	5			26	SPT				
				50	MC-4B	103	4		
	10			32	SPT				
				32	SPT-6		4		
	15			43	SPT				
				39	SPT-8		2		
	20			38	SPT				
161.0			Bottom of Boring at 21.5 feet.						
	25								
	30								

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0

CORNERSTONE EARTH GROUP2 - CORNERSTONE 0812.GDT - 8/19/19 08:41 - P:\DRAFTING\GINT FILES\187-55-1 MARINA PUMP STATION.GPJ

BORING NUMBER EB-3

CORNERSTONE EARTH GROUP

PROJECT NAME MCWD A1/A2 Reservoirs & B/C Booster Pump Station
PROJECT NUMBER 187-55-1
PROJECT LOCATION 8th Street and 6th Avenue, Marina, CA
DATE STARTED 6/26/19 DATE COMPLETED 6/26/19
GROUND ELEVATION 195 FT +/- BORING DEPTH 50 ft.
DRILLING CONTRACTOR Exploration Geoservices, Inc. LATITUDE 36.656476° LONGITUDE -121.796277°
DRILLING METHOD Mobile B-56, 8 inch Hollow-Stem Auger GROUNDWATER LEVELS:
LOGGED BY JLC AT TIME OF DRILLING Not Encountered
NOTES AT END OF DRILLING Not Encountered

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ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE
195.0	0	2 inches asphalt concrete over 4 inches aggregate base						
194.5		**Poorly Graded Sand (SP) [Fill]** very dense, moist, brown and yellowish brown mottled, fine sand	48	SPT-1		5		
			50/4"	MC-2B	108	5		
	5	becomes dense	33	SPT				
188.0		**Poorly Graded Sand with Silt (SP-SM)** medium dense, moist, brown to light brown, fine sand	30	MC-4B	99	4		9
			17	SPT-5		2		
	10		16	SPT-6		2		6
		becomes dense, color changes to light brown	36	SPT				
	15	becomes medium dense	23	SPT-8		3		8
178.0		**Poorly Graded Sand (SP)** medium dense, moist, light brown, fine sand	26	SPT-9		2		
	20	becomes dense	40	SPT				
		becomes very dense	50/6"	SPT-11		2		
	25							
		becomes medium dense	32	SPT-12		4		
	30		33	SPT				
164.0								
163.5		*Continued Next Page*						

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0

BORING NUMBER EB-3

CORNERSTONE EARTH GROUP

PROJECT NAME MCWD A1/A2 Reservoirs & B/C Booster Pump Station

PROJECT NUMBER 187-55-1

PROJECT LOCATION 8th Street and 6th Avenue, Marina, CA

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ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE
163.5			**Poorly Graded Sand (SP)** dense, moist, light brown, fine sand						
	35			49	SPT-14		4		
	40			52	SPT				
	45			52	SPT-16		3		
145.0	50		some medium sand Bottom of Boring at 50.0 feet.	60	SPT				
	55								
	60								
	65								

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0

CORNERSTONE EARTH GROUP2 - CORNERSTONE 0812.GDT - 8/19/19 08:41 - P:\DRAFTING\GINT FILES\187-55-1 MARINA PUMP STATION.GPJ

BORING NUMBER EB-4

CORNERSTONE EARTH GROUP

PROJECT NAME MCWD A1/A2 Reservoirs & B/C Booster Pump Station
PROJECT NUMBER 187-55-1
PROJECT LOCATION 8th Street and 6th Avenue, Marina, CA
DATE STARTED 6/26/19 DATE COMPLETED 6/26/19
GROUND ELEVATION 200.5 FT +/- BORING DEPTH 51.5 ft.
DRILLING CONTRACTOR Exploration Geoservices, Inc. LATITUDE 36.655799° LONGITUDE -121.796484°
DRILLING METHOD Mobile B-56, 8 inch Hollow-Stem Auger GROUNDWATER LEVELS:
LOGGED BY JLC AT TIME OF DRILLING Not Encountered
NOTES AT END OF DRILLING Not Encountered

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE
200.5	0	2 inches asphalt concrete over 6 inches aggregate base						
199.8		**Silty Sand (SM) [Fill]** dense, moist, brown, fine sand	40	MC-1B	110	7		16
197.5		**Poorly Graded Sand (SP) [Fill]** dense, moist, light brown and brown mottled, fine sand	34	SPT				
	5	becomes very dense	50/4"	MC-3B	106	4		
		becomes dense	39	SPT				
	10		78	MC-5B	104	4		3
187.5		**Poorly Graded Sand with Silt (SP-SM)** dense, moist, brown and light brown mottled, fine sand	30	SPT				
	15	becomes medium dense	23	SPT-7		5		12
			21	SPT				
180.5	20	**Poorly Graded Sand with Silt (SP-SM)** loose, moist, brown to light brown, fine sand	12	SPT-9		6		
	25	becomes medium dense	11	SPT-10		5		7
			15	SPT				
172.5		**Poorly Graded Sand (SP)** medium dense, moist, light brown, fine sand	18	SPT-12		5		
	30		25	SPT				
169.0								

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0

Continued Next Page

BORING NUMBER EB-4

CORNERSTONE EARTH GROUP

PROJECT NAME MCWD A1/A2 Reservoirs & B/C Booster Pump Station

PROJECT NUMBER 187-55-1

PROJECT LOCATION 8th Street and 6th Avenue, Marina, CA

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE
169.0			**Poorly Graded Sand (SP)** medium dense, moist, light brown, fine sand						
	35		becomes very dense	61	SPT-14		3		
163.5			**Poorly Graded Sand with Silt (SP-SM)** medium dense, moist, light brown, fine sand	30	SPT				
	40			28	SPT-16		8		5
	45		becomes dense	45	SPT				
	50		becomes medium dense	30	SPT-18		6		
149.0				33	SPT				
	55		Bottom of Boring at 51.5 feet.						
	60								
	65								

UNDRAINED SHEAR STRENGTH, ksf

○ HAND PENETROMETER

△ TORVANE

● UNCONFINED COMPRESSION

▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL

1.0 2.0 3.0 4.0

APPENDIX B: LABORATORY TEST PROGRAM

The laboratory testing program was performed to evaluate the physical and mechanical properties of the soils retrieved from the site to aid in verifying soil classification.

Moisture Content: The natural water content was determined (ASTM D2216) on 32 samples of the materials recovered from the borings. These water contents are recorded on the boring logs at the appropriate sample depths.

Dry Densities: In place dry density determinations (ASTM D2937) were performed on 10 samples to measure the unit weight of the subsurface soils. Results of these tests are shown on the boring logs at the appropriate sample depths.

Washed Sieve Analyses: The percent soil fraction passing the No. 200 sieve (ASTM D1140) was determined on 10 samples of the subsurface soils to aid in the classification of these soils. Results of these tests are shown on the boring logs at the appropriate sample depths.

Corrosion: Two soluble sulfate determinations (ASTM D4327), resistivity tests (ASTM G57), chloride determinations (ASTM D4327), and pH determinations (ASTM G51) were performed on two representative samples of the subsurface soils. Results of these tests are attached to this appendix.

COOPER TESTING LABORATORY

Corrosivity Tests Summary

CTL # 640-1328 Date: 7/10/2019 Tested By: PJ Checked: PJ
Client: Cornerstone Earth Group Project: Marina Pump Station Proj. No: 187-55-1
Remarks:

Sample Location or ID			Resistivity @ 15.5 °C (Ohm-cm)			Chloride	Sulfate		pH	ORP (Redox)		Sulfide	Moisture	Soil Visual Description
			As Rec.	Min	Sat.	mg/kg	mg/kg	%				Qualitative	At Test	
						Dry Wt.	Dry Wt.	Dry Wt.		E_H (mv)	At Test	by Lead	%	
Boring	Sample, No.	Depth, ft.	ASTM G57	Cal 643	ASTM G57	ASTM D4327	ASTM D4327	ASTM D4327	ASTM G51	ASTM G200	Temp °C	Acetate Paper	ASTM D2216	
EB-2	2A	3.5	-	-	45,617	7	82	0.0082	7.3	-	-	-	5.7	Yellowish Brown Silty SAND
EB-4	1A	1.5	-	-	20,890	6	249	0.0249	6.8	-	-	-	8.0	Yellowish Brown Silty SAND

APPENDIX C: CORNERSTONE EARTH GROUP 2007 EXPLORATION LOGS AND LABORATORY DATA

APPENDIX A – FIELD INVESTIGATION

The field investigation consisted of a surface reconnaissance and a subsurface exploration program using truck-mounted drilling equipment. Five 8-inch diameter exploratory borings were drilled on June 13 and 18, 2007 to depths of 20 to 50 feet. The approximate locations of exploratory borings are shown on the Site Plan, Figure 2. The soils encountered were continuously logged in the field by our representative and described in accordance with the Unified Soil Classification System (ASTM D2488). Boring logs, as well as a key to the classification of the soil, are included as part of this appendix.

Boring locations were approximated using existing site features site features as references using a hand held tape measure. Boring elevations were determined by interpolation of spot elevations shown on the boundary survey plan by others. The locations and elevations of the borings should be considered accurate only to the degree implied by the method used.

Representative soil samples were obtained from the borings at selected depths. All samples were returned to our laboratory for evaluation and appropriate testing. The standard penetration resistance blow counts were obtained by dropping a 140-pound hammer through a 30-inch free fall. The 2-inch O.D. split-spoon sampler was driven 18 inches and the number of blows was recorded for each 6 inches of penetration (ASTM D1586). 2.5-inch I.D. samples were obtained using a Modified California Sampler driven into the soil with the 140-pound hammer previously described. Unless otherwise indicated, the blows per foot recorded on the boring log represent the accumulated number of blows required to drive the last 12 inches. The various samplers are denoted at the appropriate depth on the boring logs.

Attached boring logs and related information depict subsurface conditions at the locations indicated and on the date designated on the logs. Subsurface conditions at other locations may differ from conditions occurring at these boring locations. The passage of time may result in altered subsurface conditions due to environmental changes. In addition, any stratification lines on the logs represent the approximate boundary between soil types and the transition may be gradual.

UNIFIED SOIL CLASSIFICATION (ASTM D-2487-98)

MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES			GROUP SYMBOL	SOIL GROUP NAMES & LEGEND
COARSE-GRAINED SOILS >50% RETAINED ON NO. 200 SIEVE	GRAVELS >50% OF COARSE FRACTION RETAINED ON NO 4. SIEVE	CLEAN GRAVELS <5% FINES	Cu>4 AND 1<Cc<3	GW	WELL-GRADED GRAVEL
			Cu>4 AND 1>Cc>3	GP	POORLY-GRADED GRAVEL
		GRAVELS WITH FINES >12% FINES	FINES CLASSIFY AS ML OR CL	GM	SILTY GRAVEL
			FINES CLASSIFY AS CL OR CH	GC	CLAYEY GRAVEL
	SANDS >50% OF COARSE FRACTION PASSES ON NO 4. SIEVE	CLEAN SANDS <5% FINES	Cu>6 AND 1<Cc<3	SW	WELL-GRADED SAND
			Cu>6 AND 1>Cc>3	SP	POORLY-GRADED SAND
		SANDS AND FINES >12% FINES	FINES CLASSIFY AS ML OR CL	SM	SILTY SAND
			FINES CLASSIFY AS CL OR CH	SC	CLAYEY SAND
FINE-GRAINED SOILS >50% PASSES NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT<50	INORGANIC	PI>7 AND PLOTS>"A" LINE	CL	LEAN CLAY
			PI>4 AND PLOTS<"A" LINE	ML	SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OL	ORGANIC CLAY OR SILT
	SILTS AND CLAYS LIQUID LIMIT>50	INORGANIC	PI PLOTS >"A" LINE	CH	FAT CLAY
			PI PLOTS <"A" LINE	MH	ELASTIC SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OH	ORGANIC CLAY OR SILT
HIGHLY ORGANIC SOILS		PRIMARILY ORGANIC MATTER, DARK IN COLOR, AND ORGANIC ODOR		PT	PEAT

OTHER MATERIAL SYMBOLS

- Poorly-Graded Sand with Clay
- Clayey Sand
- Sandy Silt
- Artificial/Undocumented Fill
- Poorly-Graded Gravelly Sand
- Topsoil
- Well-Graded Gravel with Clay
- Well-Graded Gravel with Silt
- Sand
- Silt
- Well Graded Gravelly Sand
- Gravelly Silt
- Asphalt
- Boulders and Cobble

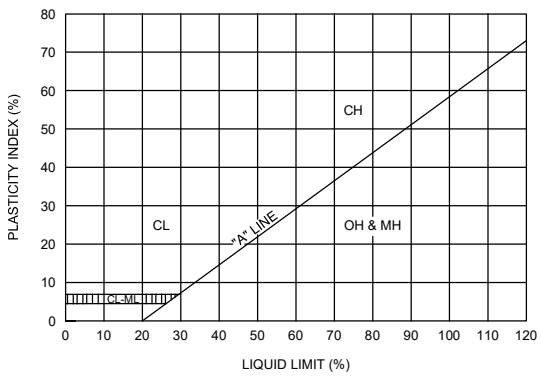
SAMPLER TYPES

- SPT
- Modified California (2.5" I.D.)
- Rock Core
- Shelby Tube
- No Recovery

ADDITIONAL TESTS

CA	-	CHEMICAL ANALYSIS (CORROSIVITY)	PI	-	PLASTICITY INDEX
CD	-	CONSOLIDATED DRAINED TRIAXIAL	SW		SWELL TEST
CN	-	CONSOLIDATION	TC	-	CYCLIC TRIAXIAL
CU	-	CONSOLIDATED UNDRAINED TRIAXIAL	TV	-	TORVANE SHEAR
DS	-	DIRECT SHEAR	UC	-	UNCONFINED COMPRESSION
PP	-	POCKET PENETROMETER (TSF)	(1.5)	-	(WITH SHEAR STRENGTH IN KSF)
(3.0)	-	(WITH SHEAR STRENGTH IN KSF)		-	
RV	-	R-VALUE	UU		UNCONSOLIDATED UNDRAINED TRIAXIAL
SA	-	SIEVE ANALYSIS: % PASSING #200 SIEVE		-	
▼	-	WATER LEVEL			

PLASTICITY CHART



PENETRATION RESISTANCE
(RECORDED AS BLOWS / FOOT)

SAND & GRAVEL		SILT & CLAY		
RELATIVE DENSITY	BLOWS/FOOT*	CONSISTENCY	BLOWS/FOOT*	STRENGTH** (KSF)
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 0.5
LOOSE	4 - 10	SOFT	2 - 4	0.5 - 1.0
MEDIUM DENSE	10 - 30	MEDIUM STIFF	4 - 8	1.0 - 2.0
DENSE	30 - 50	STIFF	8 - 15	2.0 - 4.0
VERY DENSE	OVER 50	VERY STIFF	15 - 30	4.0 - 8.0
		HARD	OVER 30	OVER 8.0

* NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT-BARREL SAMPLER THE LAST 12 INCHES OF AN 18-INCH DRIVE (ASTM-1586 STANDARD PENETRATION TEST).

** UNDRAINED SHEAR STRENGTH IN KIPS/SQ. FT. AS DETERMINED BY LABORATORY TESTING OR APPROXIMATED BY THE STANDARD PENETRATION TEST, POCKET PENETROMETER, TORVANE, OR VISUAL OBSERVATION.

CORNERSTONE EARTH GROUP

LEGEND TO SOIL DESCRIPTIONS

Figure Number A-1

BORING NUMBER EB-1

CORNERSTONE EARTH GROUP

PROJECT NAME MCWD Reservoir and Pump Station
PROJECT NUMBER 142-1-1
PROJECT LOCATION Marina

DATE STARTED 6/18/07 **DATE COMPLETED** 6/18/07
GROUND ELEVATION 196 FT +/- **BORING DEPTH** 45 ft.
DRILLING CONTRACTOR EGI **LATITUDE** **LONGITUDE**
DRILLING METHOD 8" HSA **GROUND WATER LEVELS:**
LOGGED BY SEF **AT TIME OF DRILLING** Not Encountered
NOTES **AT END OF DRILLING** Not Encountered

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ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-VALUE (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	PLASTICITY INDEX, %	PERCENT PASSING NO. 200 SIEVE
196.0	0	2 inches AC over 6 inches aggregate base						
195.5		**Silty Sand (SM) [Fill]** loose, moist, dark brown	7	SPT-1		8		14
194.0		**Silty Sand (SM) [Fill]** loose, moist, light brown to brown, mottled	4	SPT-2		6		15
	5		7	SPT-3		9		16
190.0		**Silty Sand (SM) [Fill]** loose, moist, brown to yellow brown, mottled						
186.5			11	SPT-4		10		15
	10	**Poorly Graded Sand (SP) [Native]** loose, moist, yellow brown	10	SPT-5		7		6
182.0			35	SPT-6		3		3
	15	**Poorly Graded Sand (SP)** dense, moist, yellow brown						
			36	SPT-7		3		
	20							
			28	SPT-8		6		
	25							
			58	SPT-9		4		
	30							
			48	SPT-10		4		
161.0	35							

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0 5.0

Continued Next Page

BORING NUMBER EB-1

CORNERSTONE EARTH GROUP

PROJECT NAME MCWD Reservoir and Pump Station

PROJECT NUMBER 142-1-1

PROJECT LOCATION Marina

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ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-VALUE (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	PLASTICITY INDEX, %	PERCENT PASSING NO. 200 SIEVE
161.0	35		**Poorly Graded Sand (SP)** very dense, moist, yellow brown						
	40			85	SPT-11		3		
				70	SPT-12		3		
151.0	45		Bottom of Boring at 45.0 feet.						
	50								
	55								
	60								
	65								
	70								
	75								

UNDRAINED SHEAR STRENGTH, ksf

○ HAND PENETROMETER

△ TORVANE

● UNCONFINED COMPRESSION

▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL

1.0 2.0 3.0 4.0 5.0

BORING NUMBER EB-2

CORNERSTONE EARTH GROUP

PROJECT NAME MCWD Reservoir and Pump Station
PROJECT NUMBER 142-1-1
PROJECT LOCATION Marina

DATE STARTED 6/13/07 **DATE COMPLETED** 6/13/07
GROUND ELEVATION 198 FT +/- **BORING DEPTH** 31.5 ft.
DRILLING CONTRACTOR EGI **LATITUDE** **LONGITUDE**
DRILLING METHOD 8" HSA **GROUND WATER LEVELS:**
LOGGED BY SEF **AT TIME OF DRILLING** Not Encountered
NOTES **AT END OF DRILLING** Not Encountered

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ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-VALUE (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	PLASTICITY INDEX, %	PERCENT PASSING NO. 200 SIEVE
198.0	0							
197.6		2 inches AC over 4 1/2 inches aggregate base **[Fill]**						
		Poorly Graded Sand (SP) [Native] medium dense, moist, yellow brown, fine grained	14	SPT-1		6		
			14	SPT-2		5		4
	5		13	SPT-3		4		
			22	SPT-4		5		
	10		28	SPT-5		4		7
187.0		**Poorly Graded Sand (SP)** dense, moist, yellow brown, fine grained	44	SPT-6		4		
	15		56	SPT-7		3		
	20		45	SPT-8		3		
	25		45	SPT-11		4		
	30		48	SPT-12		5		
166.5		Bottom of Boring at 31.5 feet.						
	35							

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0 5.0

CORNERSTONE EARTH GROUP - CORNERSTONE.GDT - 7/19/07 14:38 - C:\PROGRAM FILES\GINT\PROJECTS\142-1-1 MCWD.GPJ

BORING NUMBER EB-3

CORNERSTONE EARTH GROUP

PROJECT NAME MCWD Reservoir and Pump Station
PROJECT NUMBER 142-1-1
PROJECT LOCATION Marina

DATE STARTED 6/13/07 **DATE COMPLETED** 6/18/07
GROUND ELEVATION 204 FT +/- **BORING DEPTH** 76.5 ft.
DRILLING CONTRACTOR EGI **LATITUDE** **LONGITUDE**
DRILLING METHOD 8" HSA **GROUND WATER LEVELS:**
LOGGED BY SEF **AT TIME OF DRILLING** Not Encountered
NOTES **AT END OF DRILLING** Not Encountered

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ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-VALUE (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	PLASTICITY INDEX, %	PERCENT PASSING NO. 200 SIEVE
204.0	0	2 inches AC over 6 inches aggregate base						
203.5		**Poorly Graded Sand (SP-SM) [Fill]** dense, moist, orange, medium to fine grained, mottled	51	MC-2	95	4		7
201.5		at 2 1/2 feet becomes medium dense, yellow brown	18	SPT-3		2		3
	5	**Sand (SP) [Native]** medium dense, slightly moist, yellow brown, fine grained	34	MC-5	87	2		3
			24	SPT-6		2		3
	10		38	MC-7		2		2
190.0		at 14 feet becomes dense						
	15	**Poorly Graded Sand (SP)** dense to very dense, slightly moist, yellow brown, fine grained	57	SPT-9		2		
	20		37	SPT-10		2		
	25	**Poorly Graded Sand (SP)** dense, slightly moist, yellow brown, fine grained	63	SPT-11		2		
175.0		**Poorly Graded Sand (SP)**						
	30	dense, moist, yellow brown, fine grained	39	SPT-12		7		
169.0	35							

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0 5.0

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CORNERSTONE EARTH GROUP

PROJECT NAME MCWD Reservoir and Pump Station
PROJECT NUMBER 142-1-1
PROJECT LOCATION Marina

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-VALUE (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	PLASTICITY INDEX, %	PERCENT PASSING NO. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf (○ HAND PENETROMETER, △ TORVANE, ● UNCONFINED COMPRESSION, ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL; 1.0 2.0 3.0 4.0 5.0)
169.0	35									
167.5			stopped at 36 1/2 feet switched to B-61 on 6/18/07							
			Poorly Graded Sand (SP) dense to very dense, slightly moist, yellow brown, medium grained	68	SPT-13		4			
	40			40	SPT-14		3			
	45			64	SPT-15		3			
	50			57	SPT-16		3			
	55			65	SPT-17		2			
	60			42	SPT-18		2			
	65			55	NR-19					
	70			50/6"	SPT-20		2			
128.6	75									

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BORING NUMBER EB-3

CORNERSTONE EARTH GROUP

PROJECT NAME MCWD Reservoir and Pump Station

PROJECT NUMBER 142-1-1

PROJECT LOCATION Marina

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ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-VALUE (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	PLASTICITY INDEX, %	PERCENT PASSING NO. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf (○ HAND PENETROMETER, △ TORVANE, ● UNCONFINED COMPRESSION, ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL; 1.0 2.0 3.0 4.0 5.0)
128.6										
127.5			**Poorly Graded Sand (SP)** dense to very dense, slightly moist, yellow brown, medium grained becomes red brown	43	SPT-21		9			
			Bottom of Boring at 76.5 feet.							
	80									
	85									
	90									
	95									
	100									
	105									
	110									
	115									

BORING NUMBER EB-4

CORNERSTONE EARTH GROUP

PROJECT NAME MCWD Reservoir and Pump Station
PROJECT NUMBER 142-1-1
PROJECT LOCATION Marina

DATE STARTED 6/18/07 **DATE COMPLETED** 6/18/07
GROUND ELEVATION 202 FT +/- **BORING DEPTH** 40 ft.
DRILLING CONTRACTOR SGF **LATITUDE** _____ **LONGITUDE** _____
DRILLING METHOD 8" HSA
GROUND WATER LEVELS:
LOGGED BY SEF
▽ **AT TIME OF DRILLING** Not Encountered
NOTES _____
▼ **AT END OF DRILLING** Not Encountered

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ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-VALUE (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	PLASTICITY INDEX, %	PERCENT PASSING NO. 200 SIEVE
202.0	0	2 inches AC over 6 inches aggregate base						
201.5		**[Fill]**						
		Poorly Graded Sand (SP) [Native]						
		medium dense, slightly moist, yellow brown	12	SPT-1		7		
			14	SPT-2		6		
	5		18	SPT-3		6		
		becomes dense	31	SPT-4		4		
	10		30	SPT-5		4		
			27	SPT-6		3		
	15							
			31	SPT-7		3		
	20							
			30	SPT-8		5		
	25							
			35	SPT-9		5		
	30							
			42	SPT-10		5		
167.0	35							

Continued Next Page

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0 5.0

BORING NUMBER EB-4

CORNERSTONE EARTH GROUP

PROJECT NAME MCWD Reservoir and Pump Station

PROJECT NUMBER 142-1-1

PROJECT LOCATION Marina

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ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-VALUE (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	PLASTICITY INDEX, %	PERCENT PASSING NO. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf (○ HAND PENETROMETER, △ TORVANE, ● UNCONFINED COMPRESSION, ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL; 1.0 2.0 3.0 4.0 5.0)
167.0	35		**Poorly Graded Sand (SP)** moist, dense, yellow brown, medium grained							
				38	SPT-11		5			
162.0	40		Bottom of Boring at 40.0 feet.							
	45									
	50									
	55									
	60									
	65									
	70									
	75									

BORING NUMBER EB-5

CORNERSTONE EARTH GROUP

PROJECT NAME MCWD Reservoir and Pump Station
PROJECT NUMBER 142-1-1
PROJECT LOCATION Marina

DATE STARTED 6/13/07 **DATE COMPLETED** 6/13/07
GROUND ELEVATION 184 FT +/- **BORING DEPTH** 21.5 ft.
DRILLING CONTRACTOR EGI **LATITUDE** **LONGITUDE**
DRILLING METHOD 8" HSA **GROUND WATER LEVELS:**
LOGGED BY SEF **AT TIME OF DRILLING** Not Encountered
NOTES **AT END OF DRILLING** Not Encountered

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ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-VALUE (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	PLASTICITY INDEX, %	PERCENT PASSING NO. 200 SIEVE
184.0	0	2 inches AC over 6 inches aggregate base						
183.5		**[Fill]**						
		Poorly Graded Sand (SP) [Native] medium dense, slighty moist, yellow brown, fine grained sand	17	SPT-1		3		5
			14	SPT-2		3		3
	5		15	SPT-3		3		
			19	SPT-4		2		
	10		21	SPT-5		2		
172.0		**Poorly Graded Sand (SP)** dense, slighty moist, yellow brown	30	SPT-6		3		
	15		33	SPT-7		3		
	20		38	SPT-8		3		
162.5		Bottom of Boring at 21.5 feet.						
	25							
	30							
	35							

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0 5.0

APPENDIX B – LABORATORY TEST PROGRAM

The laboratory testing program was performed to evaluate the physical and mechanical properties of the soils retrieved from the site to aid in verifying soil classification.

Moisture Content
The natural water content was determined (ASTM D2216) on fifty seven samples of the materials recovered from the borings. These water contents are recorded on the boring logs at the appropriate sample depths.

Dry Densities
In place dry density determinations (ASTM D2937) were performed on two samples to measure the unit weight of the subsurface soils. Results of these tests are shown on the boring logs at the appropriate sample depth.

Washed Sieve Analyses
The percent soil fraction passing the No. 200 sieve (ASTM D1140) was determined on 15 samples of the subsurface soils to aid in the classification of these soils. Results of these tests are shown on the boring logs at the appropriate sample depths.

APPENDIX C – SITE CORROSIVITY EVALUATION

JDH Corrosion Consultants
Incorporated

July 13, 2007

Cornerstone Earth Group
1259 Oakmead Parkway
Sunnyvale, California 94085

Attention: **Mr. Scott E. Fitinghoff, P.E., G.E.**
Principal Engineer

Subject: **Site Corrosivity Evaluation**
MCWD Pump Station
Project No. 142-1-1

Dear Scott,

In accordance with your request, we have reviewed the laboratory soils data and the in-situ soil resistivity data for the above referenced project site. Our evaluation of these results and our corresponding recommendations for corrosion control for the above referenced project foundations and buried site utilities are presented herein for your consideration.

SOIL TESTING & ANALYSIS

Soil Chemical Analysis

Four (4) soil samples from the project site were chemically analyzed for corrosivity by ***Cooper Testing Laboratories***. Each sample was analyzed for chloride and sulfate concentration, pH, resistivity at 100% saturation and moisture percentage. The test results are presented in Cooper Testing Laboratories *Corrosivity Test Summary* dated 7/5/07. The results of the chemical analysis were as follows:

Soil Laboratory Analysis

Chemical Analysis	Range of Results	Corrosion Classification*
Chlorides	<2 mg/kg	Non-corrosive
Sulfates	13 - 20 mg/kg	Non-corrosive **
pH	6.6 – 7.8	Non- corrosive**
Moisture (%)	3.1 – 6.1	Not-applicable
Resistivity at 100% Saturation	23,700 – 40,300 ohm-cm	Non-corrosive

* With respect to bare steel or ductile iron
** With respect to mortar coated steel

In-Situ Soil Resistivities

One in-situ soil resistivity measurement was performed at the project site at depths of 2.5', 5', 10', 15'and 20' and 100% of the results indicate essentially non-corrosive conditions for all soil layers to a depth of 20' below grade. These results are consistent with the boring logs also provided for our review.

DISCUSSION

Reinforced Concrete Foundations

Due to the low levels of water-soluble sulfates in these soils, special sulfate resistant cement is not required for concrete structures placed into these soils. Sulfate resistant concrete as recommended in the Uniform Building Code (UBC) for soils containing less than 0.10% water-soluble sulfate in soil by weight shall be used.

Underground Metallic Pipelines

The soils at the project site are considered to be "non-corrosive" to ductile/cast iron, steel and dielectric coated steel based on the saturated resistivity measurements, in-situ soil resistivity measurement, pH levels and water soluble sulfate levels. Therefore, no special requirements for corrosion control are required for buried metallic utilities at this site. However, all underground pipelines should be electrically isolated from above grade structures, reinforced concrete structures and copper lines in order to avoid potential galvanic corrosion problems.

LIMITATIONS

The conclusions and recommendations contained in this report are based on the information and assumptions referenced herein. All services provided herein were performed by persons who are experienced and skilled in providing these types of services and in accordance with the standards of workmanship in this profession. No other warrantees or guarantees, expressed or implied, are provided.

We thank you form the opportunity to be of service to ***Cornerstone Earth Group*** on this project and trust that you find the enclosed information satisfactory. If you have any questions or if we can be of any additional assistance, please feel free to contact us at (925) 927-6630.

Respectfully submitted,

J. Darby Howard, Jr.

J. Darby Howard, Jr., P.E.
JDH Corrosion Consultants, Inc.
Principal
Cc: File 27105

Corrosivity Test Summary

CTL # 640-021 Date: 7/5/2007 Tested By: PJ Checked: PJ

Client: Cornerstone Project: MCWD Pump Station Proj. No: 142-1-1

Remarks:

Sample Location or ID			Resistivity @ 15.5 °C (Ohm-cm)			Chloride	Sulfate-(water soluble)		pH	ORP	Sulfide	Moisture	Soil Visual Description
Boring	Sample, No.	Depth, ft.	As Rec.	Minimum	Saturated	mg/kg	mg/kg	%		(Redox)	Qualitative	%	
						Dry Wt.	Dry Wt.	Dry Wt.		mv	by Lead	At Test	
			ASTM G57	Cal 643	ASTM G57	Cal 422-mod.	Cal 417-mod.	Cal 417-mod.	ASTM G51	SM 2580B	Acetate Paper	ASTM D2216	
EB- 2	1	1-2.5	-	-	26,932	<2	16	0.0016	7.6	-	-	6.1	Yellowish Brown SAND
EB- 2	2	3-4.5	-	-	40,342	<2	13	0.0013	6.6	-	-	5.9	Yellowish Brown SAND
EB- 5	1	1-2.5	-	-	23,738	<2	20	0.0020	7.8	-	-	3.6	Olive Brown SAND, trace Gravel
EB- 5	2	3-4.5	-	-	29,456	<2	16	0.0016	7.8	-	-	3.1	Olive Brown SAND, trace Gravel