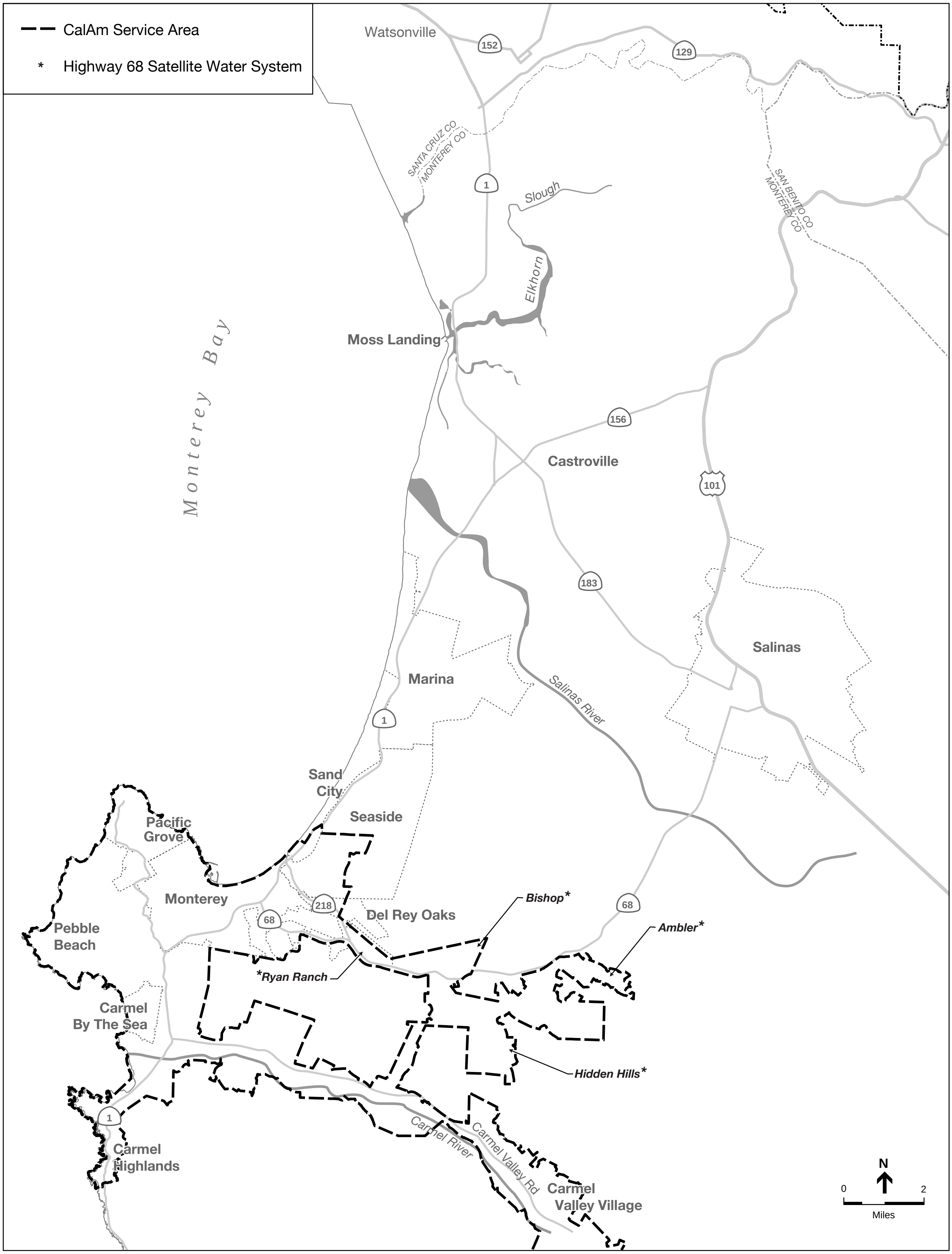
CHAPTER 3
Project Description

3.1 Introduction

The California-American Water Company (CalAm) is proposing the Monterey Peninsula Water Supply Project (MPWSP or proposed project) for the purpose of developing up to 9,752 acre-feet per year (afy) of water supplies to meet, in conjunction with other existing sources of supply, a future average annual demand of 15,296 afy in CalAm's Monterey District service area (Monterey District) (see **Figure 3-1**). The MPWSP would be constructed to replace those portions of CalAm's existing supplies that have been constrained by legal decisions regarding CalAm's diversions from the Carmel River[1] and pumping from the Seaside Groundwater Basin[2]

[1] State Water Resources Control Board (SWRCB) Order 95-10, issued in July 1995, required CalAm to undertake actions in order to reduce and terminate surface water diversions from the Carmel River in excess of CalAm's legal entitlement of 3,376 afy, and SWRCB Order 2009-0060 ("Cease and Desist Order") requires that CalAm's diversions in excess of its legal entitlements terminate no later than December 2016.

[2] In 2006, the Monterey County Superior Court adjudicated the Seaside Groundwater Basin, effectively reducing CalAm's yield from the Seaside Groundwater Basin from approximately 4,000 afy to 1,474 afy. Adjudication refers to the judicial process through which individual rights to water from the Seaside Groundwater Basin were confirmed by court decree.



SOURCE: ESA, 2013

205335.01 Monterey Peninsula Water Supply Project

Figure 3-1
CalAm Monterey District Service Area

(see Section 2.2 of Chapter 2, Water Demand, Supplies, and Water Rights, for additional information regarding the legal decisions). The proposed project would also provide sufficient supplies to accommodate demand associated with existing legal lots of record, "payback"[3] to the Seaside Groundwater Basin, water entitlements held by the Pebble Beach Company and other Del Monte Forest property owners,[4] and tourism demand under a recovered economy (see Section 2.3 of Chapter 2, Water Demand, Supplies, and Water Rights, for information regarding project demand assumptions).

The project area extends approximately 14 miles, from the MPWSP Desalination Plant site located in unincorporated Monterey County in the north to the western terminus of the proposed Monterey Pipeline in the city of Pacific Grove, and east approximately 8 miles to the unincorporated community of Hidden Hills along Highway 68 (see **Figure 3-2**). The MPWSP would include construction of up to ten subsurface slant wells and a desalination plant to produce approximately 9,752 afy to meet service area demand and approximately 875 afy to return to the Salinas Valley Groundwater Basin (discussed below in Section 3.4.3.10. The proposed MPWSP Desalination Plant, which would have a rated capacity of 9.6 million gallons per day (mgd), would be operated to produce 9.5 mgd to meet, with other supply sources, the estimated annual demand. (Refer to Section 2.5, Plant Capacity, in Chapter 2, Water Demand, Supplies, and Water Rights for more information about operating levels compared to the plant's rated capacity.)

The proposed project would also include improvements to the existing Seaside Groundwater Basin aquifer storage and recovery (ASR) system facilities, which would enable CalAm to inject desalinated product water into the groundwater basin for subsequent extraction and distribution to customers. The proposed improvements to the ASR system would increase the efficiency and long-term reliability of the ASR system for injecting Carmel River water into the groundwater basin. The proposed project also includes over 30 miles of pipelines, two pump stations, and water storage tanks.

To inform the final design of the subsurface slant wells and MPWSP Desalination Plant treatment systems, CalAm has constructed a test slant well at the CEMEX active mining area in north Marina and will operate the test slant well for up to 18 months as part of a pilot program. The pilot program will test the viability of the proposed subsurface slant wells at the CEMEX active mining area for source water production. Construction and operation of the test slant well was covered under

3 As discussed in Chapter 2, Section 2.2.3, the adjudication of the Seaside Groundwater Basin requires that CalAm provide replenishment water supplies in an amount equivalent to the quantity of water CalAm overproduced prior to the adjudication. CalAm and the Watermaster have tentatively agreed to a replenishment schedule of 25 years at a replenishment rate of 700 afy. CalAm's replenishment of the Seaside Groundwater Basin may occur as in-lieu or artificial replenishment. *In-lieu* recharge refers to groundwater that remains in a groundwater basin when groundwater users switch to surface water, desalination, or another source of supply instead of pumping from aquifers. *Artificial replenishment* refers to the injection or percolation of water into a groundwater basin to increase groundwater levels and reverse aquifer overdraft.

4 Pebble Beach Company and other fiscal sponsors were granted water entitlements totaling 380 afy for the development of a wastewater reclamation project that provides recycled water in lieu of potable water to golf courses in the Del Monte Forest. These entitlements are discussed in more detail in Chapter 2, Water Demand and Supplies, Section 2.3.2, Other Demand Assumptions.

separate environmental review[5] and is not part of the proposed project being evaluated in this EIR. However, if subsurface slant wells in this area are demonstrated to be viable, CalAm proposes to convert the test slant well into a permanent well and operate it as part of the Seawater Intake System; the conversion and long-term operation of the well has not been covered under previous approvals and is evaluated in this EIR as part of the proposed project. Chapter 4 (Environmental Setting, Impacts, and Mitigation Measures), presents the environmental setting, analyzes the impacts of the proposed project for each topical area, and proposes mitigation measures for impacts that may be significant.

In addition to the scenario described above, CalAm's Application A.12-04-019 also includes a variation of the project (MPWSP Variant or project variant) that would be capable of meeting the total demand of 15,296 afy as well as all other project objectives by combining a reduced-capacity desalination plant (a 6.4-mgd rated capacity plant that would and produce 6.1 mgd of desalinated water supplies vs. the 9.6-mgd rated capacity plant that would produce 9.5 mgd under the proposed project) with a water purchase agreement for 3,500 afy of product water from the Monterey Regional Water Pollution Control Agency's (MRWPCA) proposed Pure Water Monterey Groundwater Replenishment (GWR) project. This EIR fully evaluates the impacts of both the proposed project and the MPWSP Variant. Under the MPWSP Variant, the amount of water produced by the MPWSP Desalination Plant would be reduced (from 9,752 afy delivered to the CalAm service area to approximately 6,252 afy) compared to the proposed project. The MPWSP Variant would require fewer subsurface slant wells for the Seawater Intake System. All of CalAm's proposed facilities located south of Reservation Road would be identical under both project scenarios. Chapter 6, MPWSP Variant, describes and analyzes the project variant, including the facilities that would be owned and operated by CalAm, as well as the facilities associated with the GWR project that would be owned and operated by the MRWPCA and other entities. Chapter 6, MPWSP Variant, also compares the overall impacts of the project variant against the impacts of the proposed project.

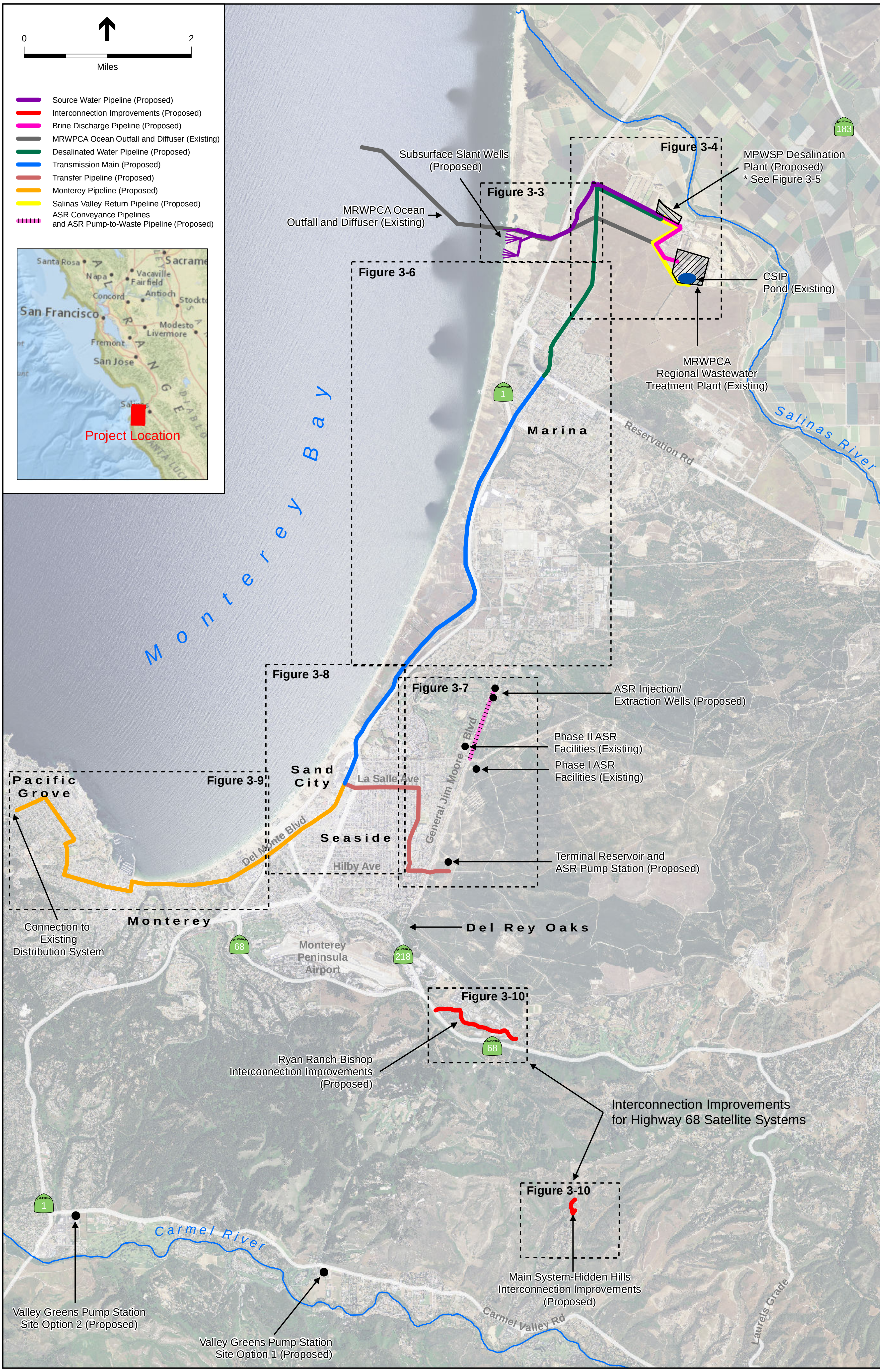
3.2 Overview of Existing Water System

3.2.1 Monterey District Service Area

CalAm's Monterey District encompasses most of the Monterey Peninsula, including the cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside, and the unincorporated areas of Carmel Highlands, Carmel Valley, Pebble Beach, and the Del Monte Forest (see **Figure 3-1**).[6] These areas constitute CalAm's main distribution system (main system). As described in Section 2.2 of Chapter 2, Water Demand, Supplies, and Water Rights, most of the

5 Environmental review covering the construction of the test slant well and operation of the pilot program was completed by the Monterey Bay National Marine Sanctuary in accordance with NEPA requirements in October 2014 and by the California Coastal Commission (CCC) in accordance with CEQA requirements in November 2014.

6 CalAm's service area boundaries generally correspond to those of the Monterey Peninsula Water Management District (MPWMD), with the exception of an area north and east of Seaside and Sand City, which is within the MPWMD's jurisdiction but is served by the Marina Coast Water District. The MPWMD manages and regulates the production of water supplies from the Carmel River and groundwater resources in the Coastal and Laguna Seca subareas of the Seaside Groundwater Basin.



SOURCE: ESA, 2014

205335.01 Monterey Peninsula Water Supply Project

Figure 3-2

Project Overview and Index Map

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Monterey District relies on diversions from the Carmel River and groundwater from the Seaside Groundwater Basin for water supply. CalAm's Monterey District also includes five small satellite water systems along the Highway 68 corridor east of Monterey (Ryan Ranch, Bishop, Hidden Hills, Toro, and Ambler).[7] The Monterey District serves approximately 42,000 customers. Average annual demand for the portion of the Monterey District that would be served by the proposed project, based on actual production for water years 2007 to 2011, is 13,290 afy (RBF Consulting, 2013a).

3.2.2 Existing Water Facilities

CalAm's existing water supply infrastructure includes: surface water extraction wells on the Carmel River; groundwater production wells in the Seaside Groundwater Basin; two surface water reservoirs on the Carmel River;[8] ASR facilities; various water treatment facilities; and a conveyance and distribution system comprised of over 500 miles of pipelines and water mains ranging in size from 2 to 36 inches in diameter. The recently constructed Coastal Desalination Plant, which is owned by the city of Sand City and is operated by CalAm, serves to offset demand in CalAm's Monterey District and also provides 94 afy of supplies to meet demand in the Monterey District.

3.2.2.1 Surface Water Extraction Wells and Groundwater Production Wells

The majority of the Monterey District water supply comes from 21 surface water extraction wells screened in the upper alluvial deposits of the Carmel River in the Carmel Valley. CalAm's Carmel River supplies are supplemented especially during the summer high-demand season by groundwater production wells in the Seaside Groundwater Basin.

3.2.2.2 Surface Storage Reservoirs

Los Padres Dam and Reservoir are located on the Carmel River, approximately 25 miles upstream of the Pacific Ocean. Los Padres Dam, an earth and rock-fill embankment dam constructed in 1951, has been owned and operated by CalAm since 1966. Constructed with an original storage capacity of 3,030 acre-feet (af), sedimentation and siltation have reduced the storage capacity of Los Padres Reservoir to approximately 1,786 af (CCoWS, 2009).

San Clemente Dam, which impounded San Clemente Reservoir, is also located on the Carmel River, approximately 18 miles from the Pacific Ocean near the confluence of San Clemente Creek. When the dam was constructed in 1921, the reservoir's storage capacity was 1,425 af. Over time, sediment and debris filled over 90 percent of the reservoir; by 2008, its storage capacity was approximately 70 af. In addition, the California Department of Water Resources (DWR) Division of

7 As discussed in Section 2.3 of Chapter 2, Water Demand, Supplies, and Water Rights, the proposed project would provide water for the Ryan Ranch, Bishop, and Hidden Hills satellite systems, which depend on groundwater supplies from the Laguna Seca subarea of the Seaside Groundwater Basin. The Toro and Ambler systems depend on groundwater supplies from the Corral de Tierra Subbasin of the Salinas Valley Groundwater Basin and would not be served by the proposed project.

8 Due to sedimentation and the reduction in reservoir capacity, San Clemente Dam is currently being removed and Los Padres Reservoir is no longer used.

Safety of Dams (DSOD) determined that the dam did not meet seismic or flood safety standards. In January 2010, due to the reservoir's reduced storage capacity and the dam's seismic safety issues, as well as to remove barriers to fish passage, restore ecological functions, and enhance recreational opportunities along the Carmel River, a formal agreement was reached between CalAm and federal, state, and local agencies to cooperatively remove San Clemente Dam (DWR, 2012). The removal of San Clemente Dam was initiated in June 2013 (CalAm, 2013b).

Due to sedimentation of these reservoirs, CalAm currently relies entirely on multiple wells in the alluvial aquifer primarily along the lower Carmel River for its Carmel River supplies.

3.2.2.3 Seaside Groundwater Basin ASR Facilities

The Seaside Groundwater Basin ASR system is located in the city of Seaside, within the former Fort Ord military base. The Seaside Groundwater Basin ASR program is being developed in three phases: Phase I was completed in 2007; Phase II has been constructed and will be operational in 2015 or early 2016; and the third phase of improvements is proposed as part of the MPWSP. The Phase I and II ASR facilities include four injection/extraction wells, two pump stations, a backflush percolation basin,[9] and conveyance pipelines.

Currently, during the wet season, when flows in the Carmel River exceed the National Marine Fisheries Service's (NMFS) and California Department of Fish and Wildlife's (CDFW) minimum mean daily instream flow requirements,[10] excess flows from the Carmel River are captured by CalAm's surface water extraction wells, treated to drinking water standards, and conveyed to the Phase I ASR injection/extraction wells in the city of Seaside for injection into the Seaside Groundwater Basin. The water is temporarily stored ("banked") in the groundwater basin, thus utilizing the available storage space within the aquifer system. During summer months and peak demand periods, the same ASR wells and/or other existing CalAm groundwater production wells in the Seaside Groundwater Basin are used to recover the banked water. Water extracted from the ASR injection/extraction wells is rechlorinated (i.e., disinfected) to restore the chlorine disinfectant residual before it enters the CalAm distribution system (MPWMD, 2005).

Construction of the Phase I ASR project was completed in 2007. Wells ASR-1 and ASR-2 (also known as Santa Margarita Wells #1 and #2) are located at the former Fort Ord military base, on the east side of General Jim Moore Boulevard near Eucalyptus Road. Wells ASR-1 and ASR-2 were brought online in 2008. These two wells have a combined physical injection capacity of approximately 4.3 mgd, or 3,000 gallons per minute (gpm). The estimated average annual water yield of Carmel River water that is put to underground storage from these two existing wells is 920 afy. ASR water supplies are disinfected onsite before being conveyed via an existing 16-inch-diameter pipeline beneath General Jim Moore Boulevard to the CalAm distribution system (MPWMD, 2005). (See Section 3.4.4.1, ASR Injection/Extraction Wells, below, for a description of the existing disinfection system.)

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

10 The minimum flow requirements are intended to protect fisheries, specifically South-Central California Coast steelhead (*Oncorhynchus mykiss*) populations, as well as wildlife and other instream uses in the Carmel River.

Construction of the Phase II ASR injection/extraction wells and associated improvements was completed in 2014. The Phase II ASR project includes two additional injection/extraction wells, an electrical control building, and appurtenant pipelines and valves. The Phase I backwash percolation basin on the east side of General Jim Moore Boulevard near Eucalyptus Road was expanded to accommodate backwash from the Phase II ASR wells. All of the Phase II facilities are located at the Seaside Middle School, on the west side of General Jim Moore Boulevard. Wells ASR-3 and ASR-4, which will begin operating in 2015 or early 2016, have a combined injection capacity of approximately 5.2 mgd, or 3,590 gpm. When used for extraction, water produced from the Phase II ASR wells is disinfected (at the existing disinfection facility located at the Phase I ASR site) before being conveyed to customers. The Phase II facilities provide the physical capacity to yield an additional 1,000 afy from the ASR system, resulting in a total capacity of 1,920 afy for the Phase I and Phase II projects combined (Denise Duffy & Associates, 2012). The 1,920 afy is based on historic hydrologic data for the Carmel River and the physical capacity of the Phase I and Phase II ASR facilities, assuming all facilities are fully functional year-round. However, as discussed in the next paragraph, for purposes of water supply reliability, because of the variability in precipitation and other factors, CalAm assumes a long-term average annual yield of 1,300 afy from the Carmel River to the ASR system.

State Water Resources Control Board (SWRCB) Permits 20808A and 20808C authorize the Monterey Peninsula Water Management District (MPWMD) and CalAm, as co-permittees, to divert up to 2,426 afy and 2,900 afy of water from the Carmel River and store the water in the Seaside Groundwater Basin via the Phase I and Phase II ASR facilities. However, since the diversions from the Carmel River that are injected into the groundwater basin via ASR are contingent on maintaining minimum mean daily instream flow requirements, because precipitation and stream flow can vary substantially from year to year, and because backflushing and other maintenance or repairs may require that certain ASR facilities be taken offline for extended periods, the water supply estimates for the proposed project assume a long-term average annual yield of 1,300 af for Carmel River supplies diverted to underground storage. SWRCB Permits 20808A and 20808C require that CalAm and the MPWMD record the instantaneous rate and cumulative quantity of water that is diverted from the Carmel River and placed into underground storage, as well as the cumulative quantity of Carmel River water recovered from underground storage and that is put to beneficial use. MPWMD's and CalAm's SWRCB Permits 20808A and 20808C are separate from, and do not affect, CalAm's right to appropriate 3,376 afy[11] of Carmel River supplies under SWRCB Order 95-10.

3.2.2.4 Treatment Facilities

Treatment requirements for Monterey District water supplies generally include: iron and manganese removal, hydrogen sulfide removal, corrosion control, and pH adjustment. Sodium hypochlorite is used for primary and secondary disinfection at each treatment facility that provides water to the distribution system.

[11] As determined by SWRCB Order 95-10, CalAm's Carmel River rights (totaling 3,376 afy) are comprised of 1,137 afy of pre-1914 appropriative water rights, 60 afy of riparian rights, and 2,179 afy per SWRCB License 11866 (SWRCB, 1995).

3.2.2.5 Highway 68 Satellite Water Systems

As described above in Section 3.2.1, CalAm's Monterey District includes five small satellite water systems located along the Highway 68 corridor east of Monterey: the Ryan Ranch, Bishop, Hidden Hills, Toro, and Ambler systems. Three of these systems—Ryan Ranch, Bishop, and Hidden Hills—currently depend on groundwater from the Laguna Seca subarea of the Seaside Groundwater Basin. With the adjudication of the Seaside Groundwater Basin, the supplies currently allocated to these satellite systems will be reduced to zero by 2018. In order to address this, the proposed project would provide water supplies to these three systems and these areas are included in the future demand assumptions. The Toro and Ambler systems depend on groundwater wells from the Corral del Tierra Subbasin of the Salinas Valley Groundwater Basin. The Toro and Ambler areas would not be served or affected by the proposed project (CalAm, 2013a).

3.2.2.6 Distribution and Conveyance

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

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

Water produced from wells along the upper and lower reaches of the Carmel River in the Carmel Valley is conveyed in two directions: westward and clockwise around the Monterey Peninsula to the city of Monterey; and northward over the hills via the Segunda Reservoir, Segunda Pipeline, Segunda Pump Station, and Crest Tank facilities to the city of Seaside. The two flows converge at a low elevation (a hydraulic trough) near the Naval Postgraduate School in the city of Monterey. This hydraulic trough prevents Carmel River water supplies from being conveyed clockwise around the Monterey Peninsula to Seaside, and also prevents water produced in Seaside (i.e., groundwater pumped from the Seaside Groundwater Basin, including water produced from the existing ASR system) from being conveyed counterclockwise around the Monterey Peninsula.

3.2.2.7 Sand City Coastal Desalination Plant

The Sand City Coastal Desalination Plant, completed in April 2010, is owned by the City of Sand City and operated by CalAm. Prior to constructing the desalination plant, the City of Sand City depended on CalAm for all of its potable water supplies. The Sand City Coastal Desalination Plant provides approximately 94 afy in long term supply to CalAm's Monterey District (RBF Consulting, 2013a).

3.3 Project Need and Objectives

3.3.1 Project Purpose and Need

The need for the MPWSP is predicated on:

- SWRCB Order 95-10, which requires CalAm to reduce and terminate surface water diversions from the Carmel River in excess of its legal entitlement of 3,376 afy, and SWRCB Order 2009-0060, which requires CalAm to terminate the diversions in excess of its legal entitlement by December 2016
- The Monterey County Superior Court's adjudication of the Seaside Groundwater Basin, which effectively reduced CalAm's pumping from the Seaside Groundwater Basin from approximately 4,000 afy at the time of the adjudication to CalAm's adjudicated right of 1,474 afy

The proposed project would be designed to meet a total projected demand of 15,296 afy, of which 9,752 afy would be provided by the proposed project and 5,544 afy by existing sources. Section 2.2 of Chapter 2, Water Demand, Supplies, and Water Rights, discusses SWRCB Orders 95-10 and 2009-0060 and the adjudication of the Seaside Groundwater Basin in more detail and Section 2.3 provides an overview of the assumptions used to determine demand.

3.3.2 Project Objectives

The primary objectives of the MPWSP are to:

- Develop water supplies for the CalAm Monterey District service area to replace existing Carmel River diversions in excess of CalAm's legal entitlement of 3,376 afy, in accordance with SWRCB Order 95-10
- Develop water supplies to enable CalAm to reduce pumping from the Seaside Groundwater Basin from approximately 4,000 to 1,474 afy, in accordance with the adjudication of the groundwater basin and consistent with natural yield
- Provide water supplies to allow CalAm to meet its obligation to pay back the Seaside Groundwater Basin by approximately 700 afy over 25 years as established by the Seaside Groundwater Basin Watermaster
- Develop a reliable water supply for the CalAm's Monterey District service area, accounting for the peak month demand of existing customers
- Develop a reliable water supply that meets fire flow requirements for public safety
- Provide sufficient water supplies to serve existing legal lots of record
- Accommodate tourism demand under recovered economic conditions
- Provide sufficient conveyance capacity to accommodate supplemental water supplies that may be developed at some point in the future to meet build out demand, in accordance with adopted General Plans
- Minimize energy requirements and greenhouse gas emissions per unit of water delivered

- Minimize project costs and associated water rate increases
- Locate key project facilities in areas that are protected against predicted future sea-level rise

Table 3-1 summarizes future water supplies for the Monterey District with implementation of the proposed project.

TABLE 3-1
FUTURE WATER SUPPLIES TO DISTRIBUTION SYSTEM
WITH IMPLEMENTATION OF THE PROPOSED PROJECT

Source	Average Annual Yield (afy)
MPWSP Desalination Plant (Proposed)	9,752
Carmel River Diversions (Existing)	3,376
ASR (Existing)	1,300[a]
Seaside Groundwater Basin (Existing)	774[b]
Sand City Coastal Desalination Plant (Existing)	94
Total	**15,296**

NOTES:

[a] SWRCB Permits 20808A and 20808C allow the MPWMD and CalAm, as co-permittees, to divert up to 2,426 afy and 2,900 afy of water from the Carmel River. Based on historic hydrologic data for the Carmel River, this equates to average annual diversions of 1,920 af of water from the Carmel River for injection into the Seaside Groundwater Basin via ASR. However, because the diversions are dependent on meeting minimum instream flow requirements for steelhead protection, and because precipitation and stream flow can vary considerably from year to year and stream flows may be below average for multiple sequential years, for the purposes of CalAm's water supply assumptions, the long-term average annual yield from injected Carmel River supplies is assumed to be 1,300 acre-feet. The proposed project would provide additional physical capacity for the injection of desalinated product water but would not increase the maximum quantity of water that can be diverted from the Carmel River for injection. The desalinated product water that might injected into underground storage and subsequently extracted for distribution to customers is included in the total average annual yield of the MPWSP Desalination Plant (9,752 afy).

[b] As discussed in Section 2.2 of Chapter 2, Water Demand, Supplies, and Water Rights, the adjudication of the Seaside Groundwater Basin requires that CalAm replenish the volume of water it has pumped from the Seaside Groundwater Basin in excess of CalAm's adjudicated right. CalAm and the Watermaster have tentatively agreed to a replenishment schedule of 25 years at a replenishment rate of 700 afy. After CalAm has fulfilled its replenishment obligations, CalAm could increase pumping to its adjudicated water right of 1,474 afy.

SOURCE: RBF Consulting, 2013a.

3.4 Proposed Project Components

The MPWSP would be comprised of the following facilities:

- The Seawater Intake System, which would consist of 10 subsurface slant wells[12] (eight active and two on standby) extending offshore into Monterey Bay, and a Source Water Pipeline
- A 9.6 mgd desalination plant, which would be operated to produce on average of 9.5 mgd of desalinated water supplies, and appurtenant facilities, including pretreatment, reverse osmosis (RO), and post-treatment systems; backwash supply and filtered water equalization tanks; chemical feed and storage facilities; brine storage and conveyance facilities; and other associated non-process facilities

[12] The first slant well to be constructed would be a test slant well that would be operated as part of the pilot program and later converted into a permanent well.

- Desalinated water conveyance facilities, including pipelines, pump stations, clearwells, and a Terminal Reservoir
- An expanded ASR system, including two additional injection/extraction wells (Wells ASR-5 and ASR-6), a new ASR Pump Station, two parallel ASR Conveyance Pipelines to convey water to and from the ASR wells, and an ASR Pump-to-Waste System

Table 3-2 summarizes the proposed MPWSP facilities.

3.4.1 Seawater Intake System

3.4.1.1 Subsurface Slant Wells

The Seawater Intake System would include 10 subsurface slant wells (eight active and two on standby) at the coast that would draw seawater from beneath the ocean floor for use as source water for the MPWSP Desalination Plant. When compared to vertical wells, slant wells allow for a substantially increased screen length in the target water source, resulting in higher production rates. The subsurface slant wells would be located in the city of Marina, roughly 2 miles south of the Salinas River, in the active mining area of the CEMEX sand mining facility (see **Figure 3-3**). The wells would be constructed at the western terminus and south of the existing CEMEX access road and CEMEX pond. All construction activities and disturbance would occur above the maximum high-tide elevation.

Test Slant Well and Pilot Program

As part of the project design process, CalAm constructed a test slant well at the proposed slant well site and plans to operate the well as part of a pilot program for up to 18 months. The purposes of the test slant well and pilot program are to: obtain site-specific field data regarding the geology, hydrogeology, and water quality characteristics of the underlying formations; improve the precision of groundwater modeling efforts; inform the final design of the Seawater Intake System; confirm the treatment requirements for the MPWSP Desalination Plant; and verify and confirm slant well construction methods and techniques (RBF Consulting, 2013d). Construction and operation of the test slant well and pilot facilities were evaluated fully in the California Coastal Commission's CEQA-equivalent document and are not evaluated in this EIR.

The facilities that were constructed as part of the test slant well and pilot program include the slant well, a submersible well pump, a wellhead vault, electrical facilities and controls, temporary flow measurement/sampling equipment, a pipeline connection to the adjacent MRWPCA outfall to discharge the test water, and monitoring wells. The test slant well was drilled at 19 degrees below horizontal, is approximately 700 to 800 feet long, and is screened for 400 to 500 lineal feet at depths corresponding to both the Dune Sand Aquifer and the underlying 180-Foot-Equivalent Aquifer of the Salinas Valley Groundwater Basin (see Section 4.4, Groundwater Resources, for aquifer descriptions).

Upon completion of the pilot program, assuming the results indicate that subsurface slant wells in the CEMEX active mining area could provide a reliable flow of source water for the MPWSP Desalination Plant, the test slant well would be converted into a permanent seawater intake well

TABLE 3-2
FACILITIES SUMMARY – PROPOSED PROJECT

Facility	Description	Purpose
Seawater Intake System		
Subsurface Slant Wells	• Ten slant wells extending offshore beneath the Monterey Bay (one existing test slant well converted into a permanent well plus nine new wells), with up to eight wells operating at any given time and two wells maintained on standby • Each slant well would be equipped with a submersible well pump for a total feedwater supply of 24.1 mgd • Each well would be approximately 700 to 800 feet long and extend offshore to a depth of approximately 200 to 220 feet below mean sea level (msl) • The wells would be screened in the Dune Sands Aquifer and the 180-Foot-Equivalent Aquifer of the Salinas Valley Groundwater Basin	These wells would draw seawater from beneath the ocean floor for use as source water for the MPWSP Desalination Plant.
Source Water Pipeline	• 2.2-mile-long, 42-inch-diameter pipeline	This pipeline would convey the combined source water from the slant well clusters to the MPWSP Desalination Plant.
Desalination Facilities		
Pretreatment System	• Pressure filters or multimedia gravity filters would be housed within a 6,000-square-foot pretreatment building • Two 300,000-gallon backwash supply and filtered water equalization tanks • Two 0.25-acre, 6-foot-deep, lined backwash settling basins with decanting system	The pretreatment system would treat source water to remove suspended and dissolved contaminants that could damage the RO system, thus increasing the efficiency and lifespan of the RO system.
Reverse Osmosis (RO) System	• Dual-pass RO system comprised of six active modules and one standby module, with each module producing 1.6 million gallons per day (mgd) of "permeate" (the purified water produced through the RO membrane) • UV disinfection system (if required) • The RO and post-treatment systems and chemical storage tanks would be housed within a 30,000-square-foot process and electrical building.	The RO system would remove salts and other minerals from pretreated source water. If required by the California Department of Public Health, the UV Disinfection system would provide additional primary disinfection.
Post-treatment System	• Chemical feedlines and injection stations (for carbon dioxide, lime, sodium hydroxide, phosphate-based corrosion inhibitor, and sodium hypochlorite)	The post-treatment system would adjust the hardness, pH, and alkalinity of the desalinated product water and disinfect the water in accordance with drinking water requirements.
Chemical Storage	• Chemical storage tanks with secondary containment • Sumps and sump pumps	This facility would provide for chemical storage. The capacity of the chemical storage tanks would range from less than 5,000 gallons to 20,000 gallons, depending on the treatment chemical.

TABLE 3-2 (Continued)
FACILITIES SUMMARY – PROPOSED PROJECT

Facility	Description	Purpose
Desalination Facilities (cont.)		
Administrative Building	• 4,000- to 6,000-square-foot building	This building would house restrooms, locker rooms, break rooms, conference rooms, electrical controls, laboratory facilities, equipment storage and maintenance, and electrical service equipment.
Brine Storage and Disposal Facilities		
Brine Storage and Disposal	• 3-million-gallon brine storage basin • 1-mile-long, 30-inch-diameter Brine Discharge Pipeline	Brine concentrate produced during the RO process would be conveyed to the brine storage basin located at the MPWSP Desalination Plant. The Brine Discharge Pipeline would convey decanted effluent from the pretreatment filtration backwash cycle and RO concentrate produced by the RO system to the existing MRWPCA outfall pipeline and diffuser.
MRWPCA Ocean Outfall Pipeline and Diffuser (existing)	• 2.3 mile-long, 60-inch diameter pipe (onshore portion) • 2.1-mile-long, 60-inch-diameter pipe (offshore portion) • 1,100-foot-long diffuser with 172 ports (120 ports are open and 52 are closed), each 2 inches in diameter and spaced 8 feet apart	Brine and pretreatment backwash effluent from the desalination plant would be conveyed to the existing ocean outfall pipeline. The outfall would terminate at a diffuser located offshore that would discharge the concentrate to Monterey Bay.
Desalinated Water Conveyance and Storage Facilities		
Clearwells (Water Storage Tanks) and Clearwell Pump Station	• one 250-horsepower pump and one 400-horsepower pump • Two 85-foot-diameter, 750,000-gallon aboveground storage tanks (with a total combined storage volume of 1.5 million gallons).	The clearwell pump station would pump water from the post-treatment process to the clearwells. The clearwells would serve as holding tanks from which water would be pumped to either the CalAm water system or the existing Castroville Seawater Intrusion Project (CSIP) pond.
Desalinated Water Pump Station	• 800-horsepower pump to pump water through the Desalinated Water Pipeline to the CalAm water system • two 20-horsepower pumps to pump water through the Salinas Valley Return Pipeline to the CSIP pond	This facility would pump desalinated product water from the MPWSP Desalination Plant to the CalAm water system and existing CSIP pond.
Salinas Valley Return Pipeline	• 1.2-mile-long, 12-inch-diameter pipeline	This pipeline would convey desalinated product water from the MPWSP Desalination Plant to the CSIP pond for subsequent delivery to agricultural users in the Salinas Valley.
Desalinated Water Pipeline	• 3.3-mile-long, 36-inch-diameter pipeline	This pipeline would convey desalinated product water from the clearwells at the MPWSP Desalination Plant to the Transmission Main at Reservation Road.
Transmission Main	• 6-mile-long, 36-inch-diameter force main	This pipeline would convey desalinated product water between the Desalinated Water Pipeline at Reservation Road to the Monterey Pipeline and Transfer Pipeline at the intersection of Del Monte Boulevard/Auto Center Parkway.

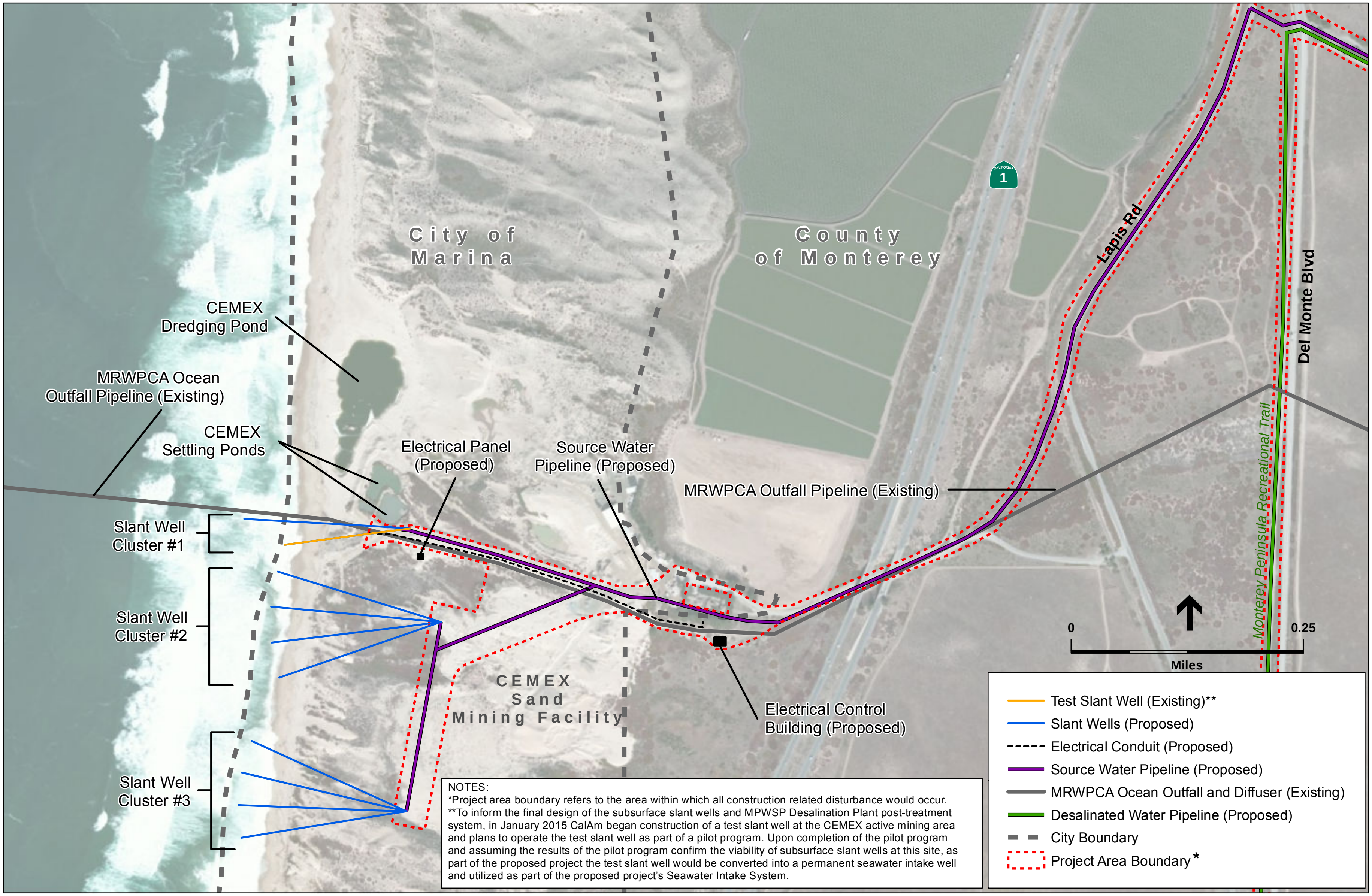
TABLE 3-2 (Continued)
FACILITIES SUMMARY – PROPOSED PROJECT

Facility	Description	Purpose
Desalinated Water Conveyance and Storage Facilities (cont.)		
Transfer Pipeline	• 2.4-mile-long, 36-inch-diameter pipeline (could be operated in both directions)	This pipeline would convey potable water supplies to the Terminal Reservoir for storage, and ASR product water and other potable water supplies stored in the Terminal Reservoir to the Monterey Pipeline.
Monterey Pipeline	• 5.4-mile-long, 36-inch-diameter pipeline (could be operated in both directions)	This pipeline would convey water supplies between its connection with the Transmission Main and Transfer Pipeline Seaside to the Monterey Peninsula.
Interconnection Improvements for Highway 68 Satellite Systems a) Ryan Ranch–Bishop Interconnection b) Main System–Hidden Hills Interconnection	a) 1.1-mile-long, 8-inch-diameter pipeline b) 1,200-foot-long, 6-inch-diameter pipeline	These interconnection pipelines and associated improvements would allow MPWSP supplies to be conveyed to the Ryan Ranch, Bishop, and Hidden Hills water systems.
Terminal Reservoir	• Two 3-million-gallon storage tanks	These tanks would store desalinated product water and ASR product water.
Valley Greens Pump Station	• 3-mgd, 100-horsepower pump station	This 600-square-foot facility would provide the additional water pressure needed to pump water through the existing Segunda Pipeline into Segunda Reservoir.
ASR System		
Six ASR Injection/Extraction Wells (four existing wells and two proposed): a) Wells ASR-1 and ASR-3 (existing) b) Wells ASR-3 and ASR-4 (existing) c) Wells ASR-5 and ASR-6 (proposed)	• Two proposed 1,000-foot-deep injection/extraction wells (Wells ASR-5 and ASR-6) with a combined injection capacity of 2.2 mgd and extraction capacity of 4.3 mgd • Four existing injection/extraction wells (Phase I and II wells)	The existing and proposed ASR injection/extraction wells would be used to inject Carmel River supplies and desalinated product water into the Seaside Groundwater Basin for storage. During periods of peak demand, the stored water would be extracted and delivered to customers.
ASR Pump Station	• 300-horsepower pump station	This pump station would be used to pump water to and from the ASR injection/extraction wells through existing and proposed pipelines.
ASR Conveyance Pipelines	• Two parallel 0.9-mile-long, 30-inch-diameter pipelines	One of these pipelines would be used to convey water from existing conveyance facilities at the corner of Coe Avenue and General Jim Moore Boulevard to the new ASR-5 and ASR-6 Wells for injection; the other pipeline would be used to convey extracted ASR supplies to the same existing facilities.

TABLE 3-2 (Continued)
FACILITIES SUMMARY – PROPOSED PROJECT

Facility	Description	Purpose
ASR System (cont.)		
ASR Pump-to-Waste System	• 0.9-mile-long, 16-inch-diameter ASR Pump-to-Waste Pipeline • 4,800-square-foot, 12-foot-deep ASR Settling Basin	The ASR Pump-to-Waste System would flush sediment and other suspended solids out of the two proposed ASR injection/extraction wells and convey it to a new settling basin (the proposed ASR Settling Basin) at the same site, or to the existing settling basin for Wells ASR-1 and ASR-2 located approximately 2 miles to the south. The ASR Pump-to-Waste Pipeline would connect to existing pump-to-waste pipelines located at the intersection of General Jim Moore Boulevard and Coe Avenue.

SOURCE: RBF Consulting, 2013b, with subsequent refinements per updated info provided by CalAm.



SOURCE: ESA, 2015

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Figure 3-3

Subsurface Slant Wells at CEMEX Active Mining Area and operated as part of the proposed project facilities. Construction of the additional facilities (i.e., conveyance and treatment) needed to convert the test slant well into a permanent well, in addition to the long-term operations and maintenance of the converted test slant well, are part of the proposed project and are therefore addressed in this EIR. Sections 3.4.1.2 through 3.4.2.6, below, describe the conveyance and treatment facilities for the source water produced at the subsurface slant wells during long-term operations.

Permanent Slant Wells

Upon completion of the pilot program, assuming the results of the pilot program confirm the viability of the subsurface slant wells at the CEMEX active mining area, the test slant well would be converted into a permanent seawater intake well and utilized as part of the proposed project's Seawater Intake System, and nine additional slant wells would be constructed. All 10 slant wells would be designed as pumping wells, and a submersible pump would be lowered into each wellhead to provide the combined 24.1 mgd of feedwater. The slant wells would be completed using 30-inch-diameter casing.

The 10 slant wells would be grouped into three well clusters: one cluster with two wells (the test slant well and another permanent slant well) and two clusters with four wells each. The wellheads would be located above the maximum high tide elevation. The wellheads in each cluster would be encased in a single concrete vault. The concrete vaults would be approximately 20 feet wide, 30 feet long, and 10 feet deep, and buried 5 feet below grade. The concrete vaults would provide maintenance access to the wellheads and pumps.

The wellhead vaults for the northernmost well cluster, which would include the test slant well and another permanent slant well, would be located beneath the CEMEX access road, approximately 50 feet southeast of the CEMEX settling basins. The second and third well clusters would be located roughly 500 and 1,500 feet south of the northernmost well cluster, respectively. The electrical controls for the slant wells would be housed in an aboveground electrical control panel located approximately 50 to 60 feet east (inland) of the northernmost well cluster, and in an aboveground electrical control building located near the eastern entrance to the CEMEX property, approximately 750 feet west of Highway 1, on the south side of the CEMEX access road. The electrical panel would be 4 feet long, 2 feet wide, and 6 feet tall and would be an outdoor facility without a roof or walls. The electrical control building would be an approximately 4-foot-wide, 12-foot-long, and 6-foot-tall enclosed structure.

The nine new permanent slant wells would be approximately 700 to 800 feet long at a minimum angle of approximately 14 degrees below horizontal, and would extend offshore to a depth of 200 to 220 feet below mean sea level (msl). Each well would be screened for approximately 400 to 500 linear feet at depths corresponding to both the Dune Sand Aquifer and the underlying 180-Foot-Equivalent Aquifer of the Salinas Valley Groundwater Basin. On average, CalAm would operate eight wells at a time at approximately 2,100 gallons per minute (gpm), and maintain the other two wells on standby.

3.4.1.2 Source Water Pipeline

The approximately 2.2-mile-long, 42-inch-diameter Source Water Pipeline would convey the source water from the well clusters to the MPWSP Desalination Plant at Charles Benson Road. From the slant wells, the proposed Source Water Pipeline would generally follow the CEMEX access road and be aligned parallel to the MRWPCA's existing outfall pipeline for approximately 0.7 mile. Approximately 500 feet east of Highway 1, the Source Water Pipeline would veer northeast along a dirt path for roughly 1,000 feet to Lapis Road and continue north along Lapis Road for about 0.5 miles. Just south of where Lapis Road meets Del Monte Boulevard, the pipeline would then turn east across Del Monte Boulevard and continue east along Charles Benson Road for approximately 0.8 mile to the MPWSP Desalination Plant (see **Figures 3-3** and **3-4**).

3.4.2 MPWSP Desalination Plant

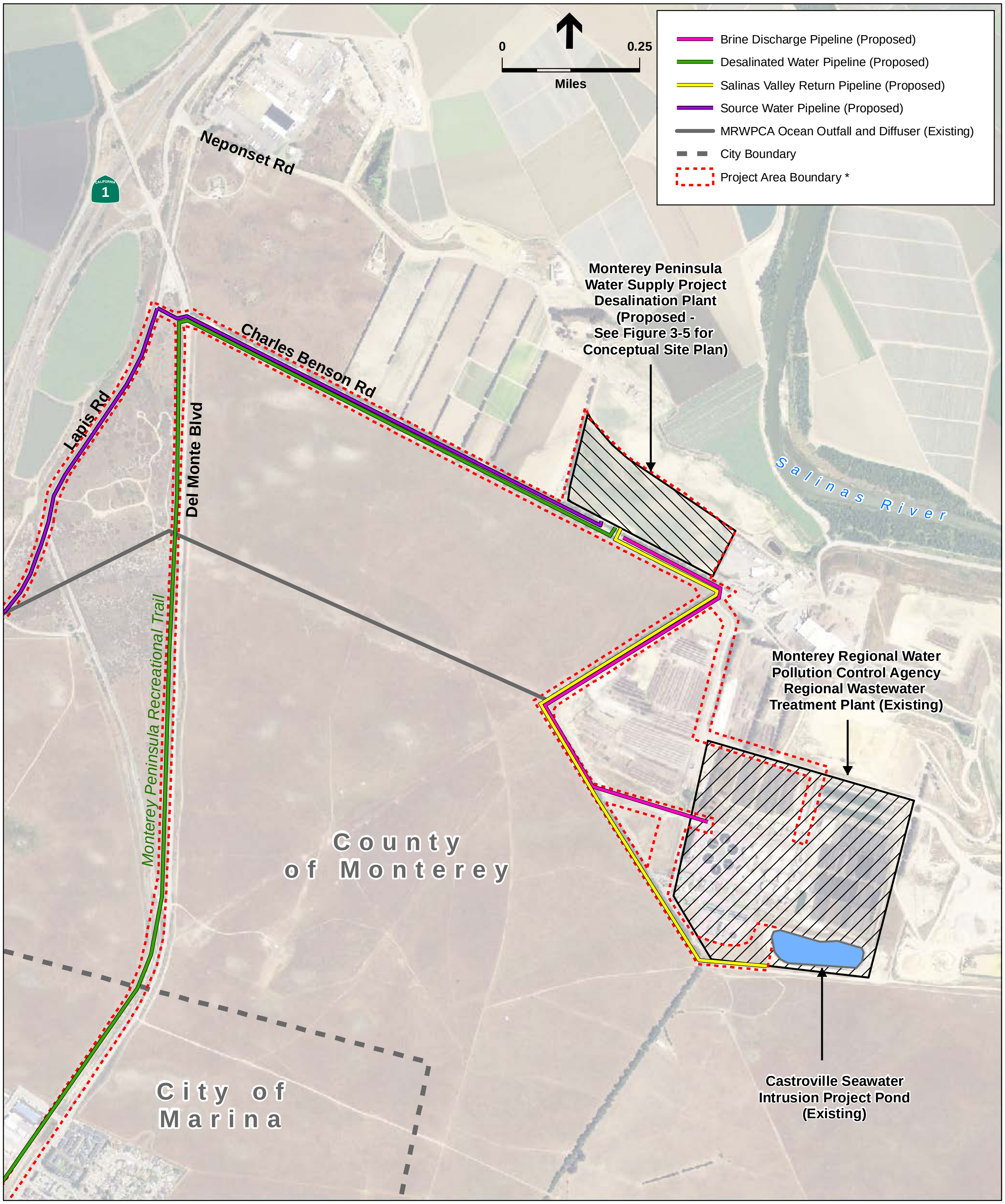
The MPWSP Desalination Plant would be constructed on the upper terrace (approximately 25 acres) of a 46-acre vacant parcel on Charles Benson Road, northwest of the MRWPCA Regional Treatment Plant and the Monterey Regional Environmental Park (see **Figure 3-4**). In 2012, CalAm purchased this parcel for the MPWSP Desalination Plant. The facilities to be constructed at the MPWSP Desalination Plant include a pretreatment system, an RO system, a post-treatment system, backwash supply and filtered water equalization tanks, desalinated product water storage and conveyance facilities, brine storage and disposal facilities, and an administration building and laboratory facility. Existing roads would provide access to the site. The proposed project would create approximately 15 acres of impervious surfaces associated with the desalination facilities, buildings, driveways, parking, and maintenance areas. The subsections that follow describe these facilities. **Figure 3-5** presents the conceptual site plan.

The MPWSP Desalination Plant would have a rated production capacity of 9.6 mgd and a maximum production capacity[13] of 11.2 mgd. The MPWSP Desalination Plant would operate at an overall recovery rate of 42 percent. Approximately 24.1 mgd of raw seawater would be needed to produce 9.5 mgd of desalinated product water.

3.4.2.1 Pretreatment System

Seawater (source water) from the subsurface intake wells would be conveyed directly to the pre-treatment system. The source water would pass through the pretreatment system to prevent the RO membranes from becoming fouled or scaled due to microbial contamination, turbidity, and other contaminants such as iron and manganese; increase the efficiency of the RO system; and extend the useful life of the RO membranes. The pretreatment requirements for seawater collected by the proposed slant wells will be determined through the operation of the test slant

[13] Maximum production capacity (11.2 mgd) represents the full physical capacity of the MPWSP Desalination Plant with all seven RO modules in service. As described in Section 3.6, after shutdown periods, CalAm may need to operate the desalination plant at maximum production capacity of 11.2 mgd to catch up on production; however, the total annual production would not exceed an average of 9.5 mgd (Svindland, 2014).



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

SOURCE: ESA, 2014

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Figure 3-4
Proposed MPWSP Desalination Plant Site

well and pilot program, but could include coagulation, flocculation,[14] and/or membrane filtration. The pretreatment system is expected to include pressure filters or multimedia gravity filters, a backwash supply storage tank, and backwash settling basins. The pretreatment system would have the capacity to process 24.1 mgd of seawater.

The pressure filters or multimedia gravity filters would be located within the MPWSP Desalination Plant site. If pressure filters are used, multiple parallel fiberglass or lined steel tanks would be partially enclosed in a 30-foot tall, 6,000-square-foot building. If gravity filters are used, they would be installed in below-grade, multi-cell concrete structures. A low dosage of chlorine (sodium hypochlorite) would be added to the source water to separate out iron and manganese, and the precipitate would be removed by the filters. In addition, the pretreatment system could play an important role in pathogen removal. If during initial plant operations it is determined that a portion of the source water supply is groundwater under the influence of surface water (or the source water is a combination of groundwater and seawater), the source water would be subject to the Surface Water Treatment Rule.[15]

The pretreatment process would produce approximately 23.6 mgd of pretreated (filtered) source water. The pretreated source water would be conveyed to two 300,000-gallon backwash supply and filtered water equalization tanks. The majority of the pretreated source water would then be pumped directly to the RO system. Approximately 9.5 mgd of desalinated product water would be produced during the RO process. Waste effluent produced during the RO process would be diverted to the brine waste stream and discharged via the existing MRWPCA outfall and diffuser.

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

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

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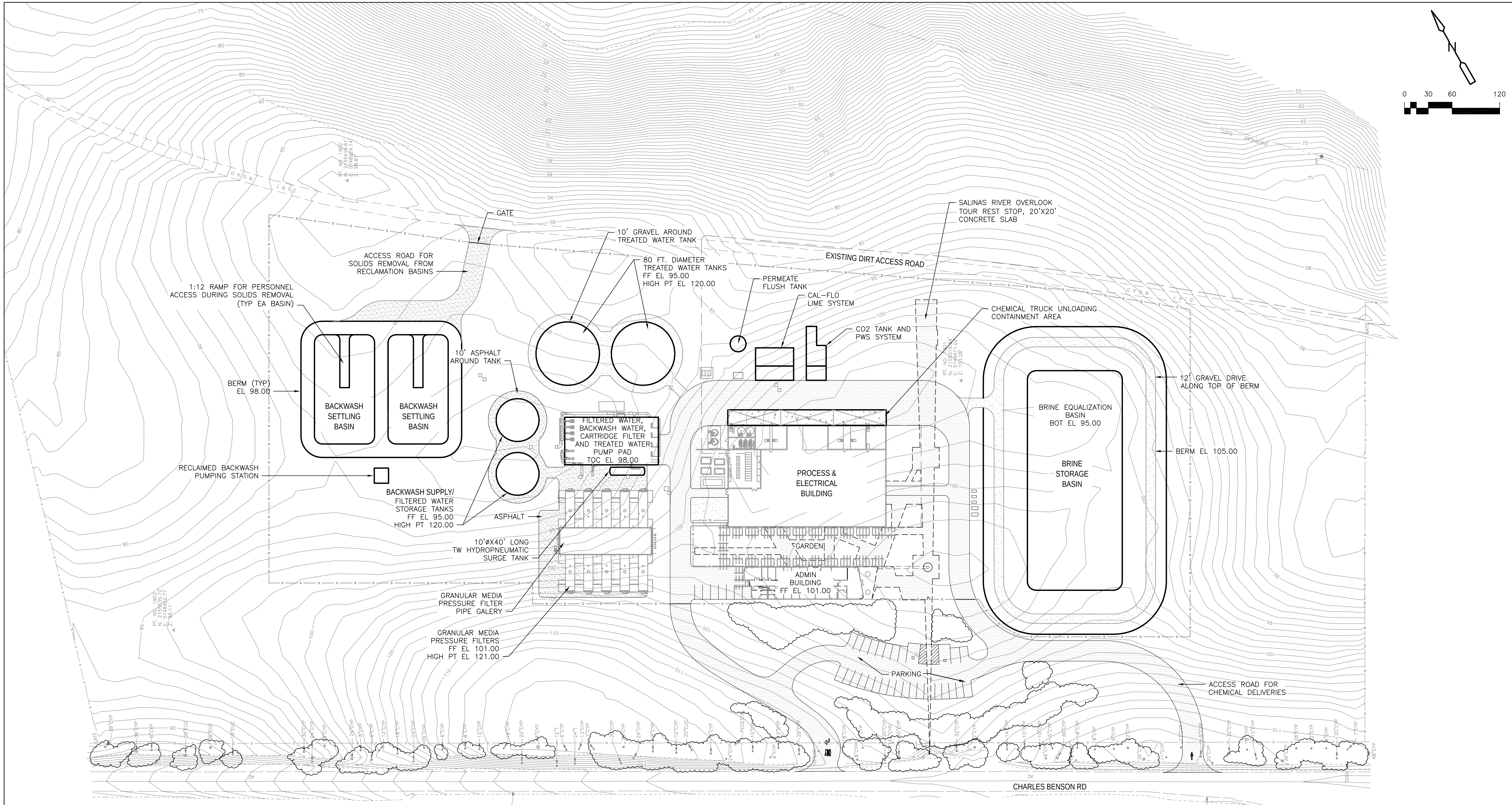
14 Flocculation is a process used to separate suspended solids from water. Flocculation involves the addition of a flocculating agent to water to promote the aggregation of suspended solids into particles large enough to settle or be removed.

15 The Surface Water Treatment Rule seeks to prevent waterborne diseases caused by viruses, *Legionella*, and *Giardia lamblia*. The rule requires that water systems filter and disinfect water from surface water sources to reduce the occurrence of unsafe levels of these microbes.



SOURCE: CDM Smith, 2014

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Figure 3-5

MPWSP Desalination Plant Conceptual Site Plan

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3.4.2.2 Reverse Osmosis System

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

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

The RO process would consist of a first-pass system as well as a partial (40 to 50 percent) second-pass system. The second-pass system is needed to reduce the concentrations of three constituents of concern: boron, chloride, and sodium. The RO system would be comprised of seven RO modules (six active and one standby), each sized to produce 1.6 mgd of permeate. Each module would include arrays of 80 to 110 24-foot-long pressure vessels mounted horizontally on a single rack; each rack would be approximately 16 feet wide by 24 feet long by 15 to 18 feet high. The RO membranes would be located inside the pressure vessels.

Variable-speed, low-pressure pumps would pump pretreated source water to constant-speed, high-pressure, first-pass RO feed pumps. The high-pressure RO feed pumps would deliver flow to the first-pass membrane arrays. Low-pressure, variable-speed pumps would be used to pump 40 to 50 percent of the first-pass permeate to the second-pass membrane arrays. The second-pass permeate would then be blended with the bypassed portion of the first-pass permeate. Approximately 23.6 mgd of pretreated source water would be needed to produce 9.5 mgd of desalinated product water.

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

The accumulation of salts or scaling on the RO membranes causes fouling, which reduces membrane performance. The RO system is expected to require cleaning two to three times per year. The RO cleaning system would be housed in the same building as the RO system and would include chemical storage, chemical feedlines, and a collection sump. System operators would clean the RO membranes by circulating a cleaning solution (made of strong bases or acids) through the membranes and then flushing the membranes with clean water to remove the spent cleaning solution and waste effluent from the RO system. The spent cleaning solution and waste effluent would be discharged into a collection sump, chemically neutralized, and discharged to the sanitary sewer system at the eastern portion of the MPWSP Desalination Plant site.

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

3.4.2.3 Post-treatment System

After leaving the RO system, the desalinated water would pass through a post-treatment system to make the water more compatible with the other water supply sources in the CalAm system and provide adequate disinfection prior to distribution to customers. It is expected that post-treatment facilities would include chemical feedlines and injection systems for lime and carbon dioxide. During the post-treatment process, carbon dioxide would be added to adjust alkalinity; lime would be added adjust calcium hardness; sodium hydroxide would be used to adjust pH; and sodium hypochlorite would be added for disinfection. Facility operators would use metering pumps and chemical feedlines to dose the post-treatment chemicals through the proper injection points along the post-treatment system. In addition to sodium hypochlorite, it is likely that an ultraviolet disinfection system would be utilized to achieve compliance with the Surface Water Treatment Rule's pathogen removal/inactivation standards. The post-treatment system would be housed within the same structure as the RO system. The final design of post-treatment facilities would be based on the water quality data collected during operation of the test slant well and pilot program and the results of a geochemical mixing study.[16] Any adjustments during final design of the post-treatment facilities would not affect any of the analyses or conclusions in this EIR.

3.4.2.4 Chemical Use and Storage

Facility operators would use various chemicals to treat the water as it passes through the pretreatment, RO, and post-treatment processes to ensure the water meets drinking water quality requirements and is compatible with native groundwater in the Seaside Groundwater Basin.[17] The various chemicals used during the desalination process would be stored onsite in accordance with applicable regulatory requirements, and storage facilities would include secondary concrete containment, alarm notification systems, and fire sprinklers. **Table 3-3** summarizes the chemicals that would be used during the desalination process and the projected annual usage amounts. The chemical storage and containment area would house 5,000- to 20,000-gallon bulk storage tanks containing the first five chemicals identified in **Table 3-3**; RO cleaning chemicals would be stored in smaller containers. Sumps and sump pumps within the chemical containment area and loading area would collect and contain any chemicals accidentally released during operations.

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

17 As discussed in Section 3.6.2, below, during winter months and periods of low demand, desalinated product water could be injected into the Seaside Groundwater Basin for storage. The post-treatment system would be designed to ensure that desalinated product water that is injected into underground storage would not adversely affect groundwater quality.

TABLE 3-3
DESALINATION CHEMICALS AND ANNUAL USAGE – PROPOSED PROJECT

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

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

3.4.2.5 Brine Storage and Disposal

As noted in Section 3.4.2.1, Pretreatment System, decanted backwash water from the backwash settling basins would either be disposed of with the RO concentrate or combined with source water and conveyed through the pre-treatment process. The RO process would generate approximately 13.98 mgd of brine (including 0.4 mgd of decanted backwash water). From the RO system, the brine would be conveyed to a 3-million-gallon brine storage basin, which would consist of a lined open basin, or directly through the 1-mile-long, 30-inch-diameter Brine Discharge Pipeline to a new connection with the existing MRWPCA outfall.

During the irrigation season (April through October) treated wastewater from the MRWPCA Regional Wastewater Treatment Plant is diverted to the Salinas Valley Reclamation Project’s tertiary treatment facility for additional advanced treatment and subsequently used for crop irrigation as part of the Castroville Seawater Intrusion Project (CSIP). During the non-irrigation season (November through March), when the CSIP is not in operation, the brine stream would be mixed with treated wastewater from the MRWPCA Regional Wastewater Treatment Plant prior to being discharged to the ocean. At all other times, the brine stream would be discharged to Monterey Bay without dilution.

The existing 2.1-mile-long MRWPCA outfall pipeline terminates at a 1,100-foot-long diffuser resting above the ocean floor at approximately 90 to 110 feet below sea level. The diffuser is equipped with 172 ports (120 ports are open and 52 are closed), each 2 inches in diameter and spaced 8 feet apart. The diffuser would disperse the brine stream at the discharge point, thereby minimizing differences in salinity and other water quality parameters between the discharged brine and the surrounding seawater.

3.4.2.6 Administrative Building

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

3.4.3 Desalinated Water Conveyance

Desalinated product water from the MPWSP Desalination Plant would be conveyed south via a series of proposed pipelines (i.e., Desalinated Water Pipeline, Transmission Main, Transfer Pipeline and Monterey Pipeline) to existing CalAm water infrastructure, as described in Sections 3.4.3.3 through 3.4.3.9, below. If it is determined that some of the source water drawn from the Seawater Intake System is groundwater from the Salinas Valley Groundwater Basin, CalAm would return an equal volume of the desalinated product water to the Salinas Valley Groundwater Basin. From the MPWSP Desalination Plant site, this water would be conveyed southeast via the proposed Salinas Valley Return Pipeline to the existing CSIP pond located at the southern end of the MRWPCA Regional Wastewater Treatment Plant site for subsequent distribution to agricultural users in the Salinas Valley (see Section 3.4.3.10, below). The composition of the source water would be determined based on aquifer data that would be collected during operation of the test slant well and pilot program, and groundwater modeling results.

3.4.3.1 Clearwells

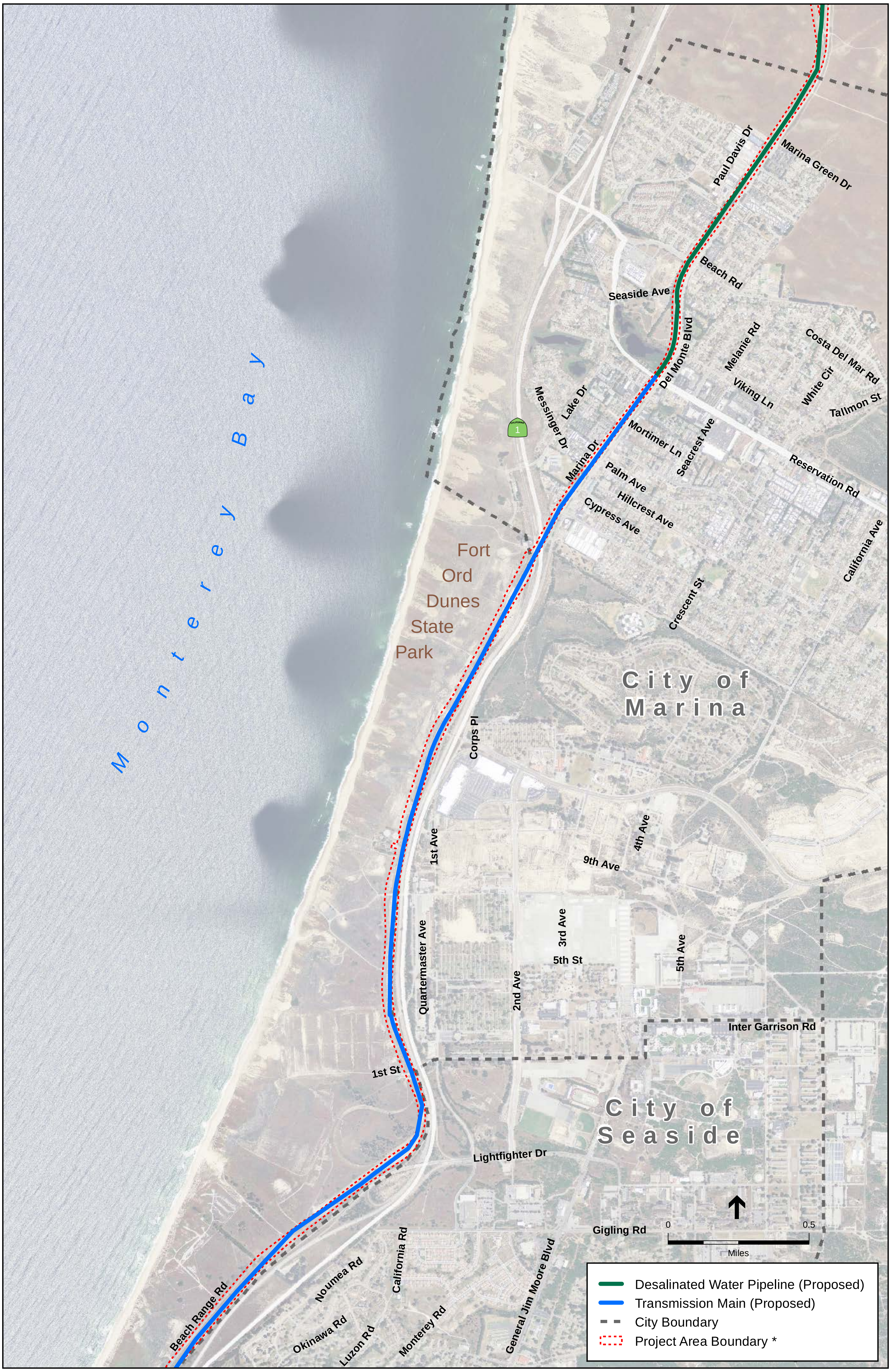
Following post-treatment, desalinated product water would be conveyed to two aboveground clearwells. Each clearwell would be comprised of an 85-foot-diameter steel or concrete tank providing 750,000 gallons of storage, for a total storage volume of 1.5 million gallons.

3.4.3.2 Desalinated Water Pump Station

The proposed Desalinated Water Pump Station would be located adjacent to the clearwells. The pump station would house two separate pump systems—a pump system to pump desalinated product water to the CalAm water system, and a pump system to pump water to the Salinas Valley. Consistent with the capacity of the MPWSP Desalination Plant, a 9.6-mgd capacity pump system would be utilized to pump desalinated product water to the CalAm water system. At this time (pending the results of the pilot program and groundwater modeling), it is assumed that a 1.4-mgd pump system would be used to pump desalinated product water to the Salinas Valley for the purpose of returning any portion of the source water that is determined to be groundwater from the Salinas Valley Groundwater Basin.

3.4.3.3 Desalinated Water Pipeline

For conveyance to the CalAm water system, the desalinated water pump station would pump desalinated product water through the proposed Desalinated Water Pipeline and Transmission Main. From the pump station, the 3.3-mile-long, 36-inch-diameter Desalinated Water Pipeline would extend west for approximately 0.8 mile along Charles Benson Road, parallel to and south of the proposed Source Water Pipeline. At Del Monte Boulevard, the Desalinated Water Pipeline would cross Del Monte Boulevard and turn south, then continue along the west side of Del Monte Boulevard, within +, for approximately 2.5 miles to a connection with the proposed Transmission Main at Reservation Road (see **Figures 3-4** and **3-6**).



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

SOURCE: ESA, 2013

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Figure 3-6

Proposed Conveyance Pipelines in Marina and Sand City

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3.4.3.4 Transmission Main

At Reservation Road, water in the Desalinated Water Pipeline would enter the 6-mile-long, 36-inch-diameter Transmission Main and then flow south along the west side of Del Monte Boulevard, within the Monterey Peninsula Recreational Trail and Transportation Agency for Monterey County (TAMC) rights-of-way, to the intersection of Del Monte Boulevard and Auto Center Parkway. The desalinated product water would still be pressurized as it enters the Transmission Main; therefore, no additional pumps would be needed at the connection between the Desalinated Water Pipeline and the Transmission Main. At the intersection of Del Monte Boulevard/Auto Center Parkway, the Transmission Main would connect to the proposed Transfer Pipeline and the Monterey Pipeline (see **Figures 3-6** and **3-8**).

3.4.3.5 Transfer Pipeline

The 2.4-mile-long, 36-inch-diameter Transfer Pipeline would allow for reversed flows and would be used to: convey desalinated product water from the Transmission Main east to the Terminal Reservoir for storage; convey ASR product water west to the Monterey Pipeline; and convey any potable water supplies stored in the Terminal Reservoir west to the Monterey Pipeline. From the intersection of Del Monte Boulevard and Auto Center Parkway, the proposed Transfer Pipeline would be routed east along Auto Center Parkway and La Salle Avenue for approximately 0.9 mile to Yosemite Street, turn south and continue for approximately 1 mile to Hilby Avenue, and then continue east for approximately 0.4 mile along Hilby Avenue to the ASR Pump Station and Terminal Reservoir (see **Figures 3-7** and **3-8**).

3.4.3.6 Terminal Reservoir

The proposed Terminal Reservoir and ASR Pump Station, described below in Section 3.4.4.2, would be located on the same site in the former Fort Ord military base, east of General Jim Moore Boulevard, on the north side of Watkins Gate Road (see **Figure 3-7**). The Terminal Reservoir tanks would be used to store potable water supplies from a variety of sources, including Carmel River supplies, desalinated product water, and ASR product water from the Seaside Groundwater Basin. The Terminal Reservoir would also serve as the hydraulic control point for the CalAm system in the city of Seaside. The Terminal Reservoir would consist of two 33-foot-high, 130-foot-diameter aboveground concrete tanks. Each tank would have a storage capacity of 3 million gallons, for a total storage capacity of 6 million gallons. The Terminal Reservoir tanks and the ASR Pump Station would be constructed on an approximately 1.8-acre concrete pad. Security fencing would enclose a 7-acre area around the Terminal Reservoir and ASR Pump Station.

3.4.3.7 Monterey Pipeline

The proposed 5.4-mile-long, 36-inch-diameter Monterey Pipeline would allow for reversed flows and would convey potable water supplies from the Transmission Main and Transfer Pipeline in the city of Seaside to the Monterey Peninsula. Currently, a hydraulic trough within the CalAm water system in the city of Monterey essentially prevents the flow of water between Seaside and the Monterey Peninsula. The Monterey Pipeline would utilize the pressure (called “hydraulic head"[18]) provided by the proposed MPWSP Desalination Plant to convey water from Seaside to the Monterey Peninsula cities. The Monterey Pipeline would connect the existing Forest Lake Reservoir pressure zone in the city of Pacific Grove to the city of Seaside. With implementation of the proposed project, water stored in Forest Lake Reservoir could flow via gravity to the lower Carmel Valley or be pumped to the upper Carmel Valley.

The eastern terminus of the Monterey Pipeline would be connected to the Transmission Main and Transfer Pipeline at the intersection of Del Monte Boulevard/Auto Center Parkway. The Monterey Pipeline would be routed southwest along the west side of Del Monte Boulevard, generally following the Monterey Peninsula Recreational Trail and TAMC right-of-way. The alignment would pass under Highway 1, and in front (north) of the Naval Postgraduate School and El Estero Park. East of El Estero Park, the pipeline would turn south on Figueroa Street and west along Franklin Street. At High Street, the alignment would bear north and traverse the Presidio of Monterey by paralleling an existing CalAm pipeline in an existing CalAm easement. At the western boundary of the Presidio of Monterey, the alignment would continue on to Spencer Street. The alignment would then turn from Spencer Street southwest on Eardley Street and terminate near the existing Eardley Pump Station (see **Figures 3-8** and **3-9**).

3.4.3.8 Valley Greens Pump Station

The Valley Greens pressure zone (in Carmel Valley south of the Segunda Reservoir) does not have sufficient hydraulic head to fill the existing Segunda Reservoir, which is located at the southern terminus of the existing Segunda Pipeline. A new pump station (the Valley Greens Pump Station) is proposed to provide the additional pressure needed to fill Segunda Reservoir. The Valley Greens Pump Station would have a pumping capacity of 3 mgd (or 2,100 gpm). It is assumed that the pump station would be enclosed in a 500-square-foot, single-story building. A 50 kW (68 hp) portable diesel-fuel powered generator would be stored onsite for use in the event of a power outage. A 100-square-foot electrical control building would be constructed outside of the pump station building.

Two sites are currently being considered for the Valley Greens Pump Station: Option 1 is located approximately 400 feet southeast of the intersection of Carmel Valley Road and Valley Greens Drive; Option 2 is located on the south side of Carmel Valley Road near Carmel Rancho Boulevard, in the northeast corner of the Carmel Rancho Shopping Center, approximately 100 feet west of the Cottages of Carmel senior assisted living facility (see **Figure 3-2**). Site Option 2 is owned by CalAm and is currently occupied by a pump station. If site Option 2 is selected, CalAm would reconfigure the existing pump station to provide the additional pressure needed to fill the Segunda Reservoir.

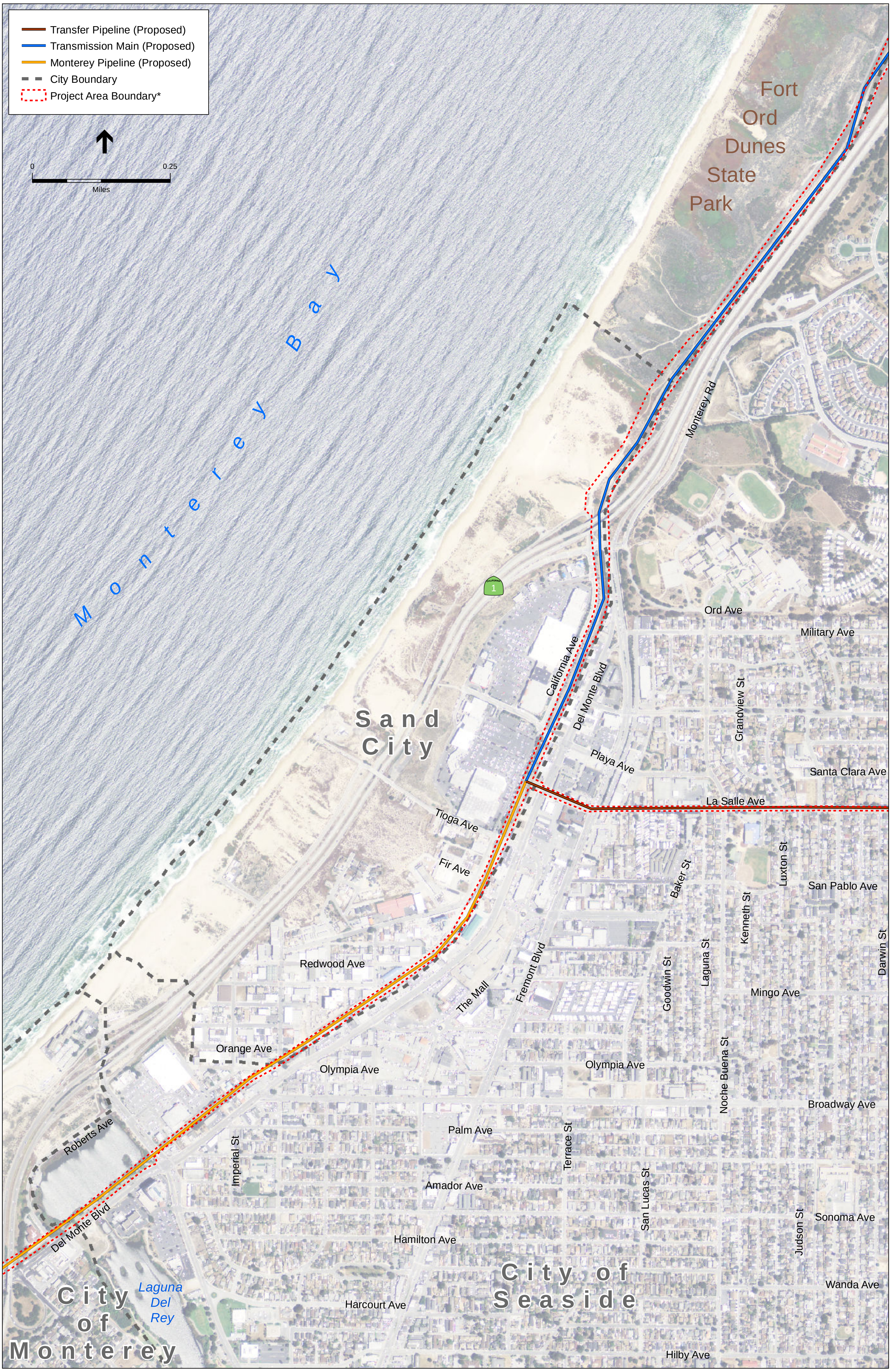
[18] Hydraulic head is the pressure of the water column and elevation difference. Stated differently, hydraulic head is the force per unit area exerted by a column of liquid at a height above a depth (and pressure) of interest. Fluids flow down a hydraulic gradient, from points of higher to lower hydraulic head. The elevation of the Terminal Reservoir relative to the end point of the Monterey Pipeline would create the "head."

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

SOURCE: ESA, 2015

205335.01 Monterey Peninsula Water Supply Project

Figure 3-7
Existing and Proposed ASR Facilities



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

SOURCE: ESA, 2015

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Figure 3-8
Proposed Conveyance Pipelines in Seaside

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

SOURCE: ESA, 2015

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Figure 3-9

Monterey Pipeline (Western Terminus)

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3.4.3.9 Interconnections with Highway 68 Satellite Systems

As described above in Section 3.2.2.5, the proposed project would also improve existing interconnections at three satellite water systems in the unincorporated communities of Ryan Ranch, Bishop, and Hidden Hills, which are located along the Highway 68 corridor (see **Figure 3-10**).

Ryan Ranch–Bishop Interconnection Improvements

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

Main System–Hidden Hills Interconnection Improvements

The existing interconnection between the main CalAm distribution system and the Hidden Hills system would be improved by installing approximately 1,200 feet of 6-inch-diameter pipeline along Tierra Grande Drive, with a connection to the existing Upper Tierra Grande Booster Station. The Upper Tierra Grande Booster Station has an existing capacity of 129 gpm. A new 350 gpm pump would be added to the booster station. In addition, the existing pump capacity of the Middle Tierra Grande Booster Station, located on lower Casiano Drive, would be upgraded from 161 gpm to 400 gpm by adding a new 350 gpm pump (CalAm, 2013a).

3.4.3.10 Salinas Valley Return Pipeline

As discussed above, if it is determined that some of the source water drawn from the Seawater Intake System is groundwater from the Salinas Valley Groundwater Basin, CalAm would return an equal volume of the desalinated product water to the Salinas Valley Groundwater Basin. For purposes of sizing the desalination plant, it is assumed that up to 875 afy of product water would be returned to the groundwater basin. The water would be pumped from the clearwells at the MPWSP Desalination Plant through the proposed 1.2-mile-long, 12-inch-diameter Salinas Valley Return Pipeline to the existing CSIP pond at the southern end of the MRWPCA Regional Wastewater Treatment Plant. The CSIP pond has a storage capacity of 80 af. From the CSIP pond, water would be delivered to agricultural users in the Salinas Valley through existing infrastructure, in lieu of an equal amount of groundwater pumping (see **Figure 3-4**).

3.4.4 Proposed ASR Facilities

As part of the MPWSP, CalAm proposes to expand the existing Seaside Groundwater Basin ASR system to provide additional injection/extraction capacity for both desalinated product water and Carmel River supplies and increase system reliability. The proposed improvements to the ASR system include: adding two injection/extraction wells (ASR-5 and ASR-6) and constructing a pump station, two parallel conveyance pipelines, a pump-to-waste pipeline, and settling basin. The proposed ASR facilities would be located near the Phase I and Phase II ASR facilities in Seaside on the former Fort Ord military base (see **Figure 3-7**). These improvements would not affect CalAm's maximum allowable surface water diversions from the Carmel River for injection into the groundwater basin.

3.4.4.1 ASR Injection/Extraction Wells ASR-5 and ASR-6

The MPWSP would construct two additional injection/extraction Wells ASR-5 and ASR-6 on two parcels located immediately east of General Jim Moore Boulevard and south of the intersection of General Jim Moore Boulevard/Ardennes Circle, in the Fitch Park military housing area (see **Figure 3-7**). The new injection/extraction wells would be constructed to a depth of approximately 1,000 feet and screened in the Santa Margarita sandstone aquifer. Each well would be equipped with a permanent 500-horsepower multi-stage vertical turbine pump, Supervisory Control and Data Acquisition controls for remote operation, and various pipes and valves. Each well pump and electrical control system would be housed in a 900-square-foot concrete pump house. A low-voltage, 480-volt, three-phase electrical transformer[19] would be installed at each well site to power the electrical control system. Pacific Gas & Electric Company (PG&E), the local electrical utility, would own and operate the electrical transformers. Security fencing would encompass an approximately 0.4- and 0.5-acre area around Wells ASR-5 and ASR-6, respectively (RBF Consulting, 2010).

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

Wells ASR-5 and ASR-6 would have a combined injection capacity of 2.2 mgd (1,050 gpm) and combined extraction capacity of approximately 4.3 mgd (3,000 gpm) (RBF Consulting, 2013b). Wells ASR-5 and ASR-6 would be operated in conjunction with Wells ASR-1, ASR-2, ASR-3, and ASR-4. With implementation of the MPWSP, any of the six ASR injection/extraction wells could be used to inject desalinated product water and Carmel River supplies.

3.4.4.2 ASR Pump Station

The ASR Pump Station would be located at the Terminal Reservoir site (see **Figure 3-7** and description above). The proposed ASR Pump Station would be equipped with a 300-horsepower pump and would have a pumping capacity of 5,850 gpm (8.4 mgd). The pump station would be enclosed in an approximately 2,000-square-foot concrete pump house. CalAm would install a 250-kW (335 hp) emergency diesel fuel -powered generator and a 1,000-gallon double-walled aboveground diesel storage tank within the same concrete pad as the pump station and Terminal Reservoir. The generator would provide backup power during power outages.

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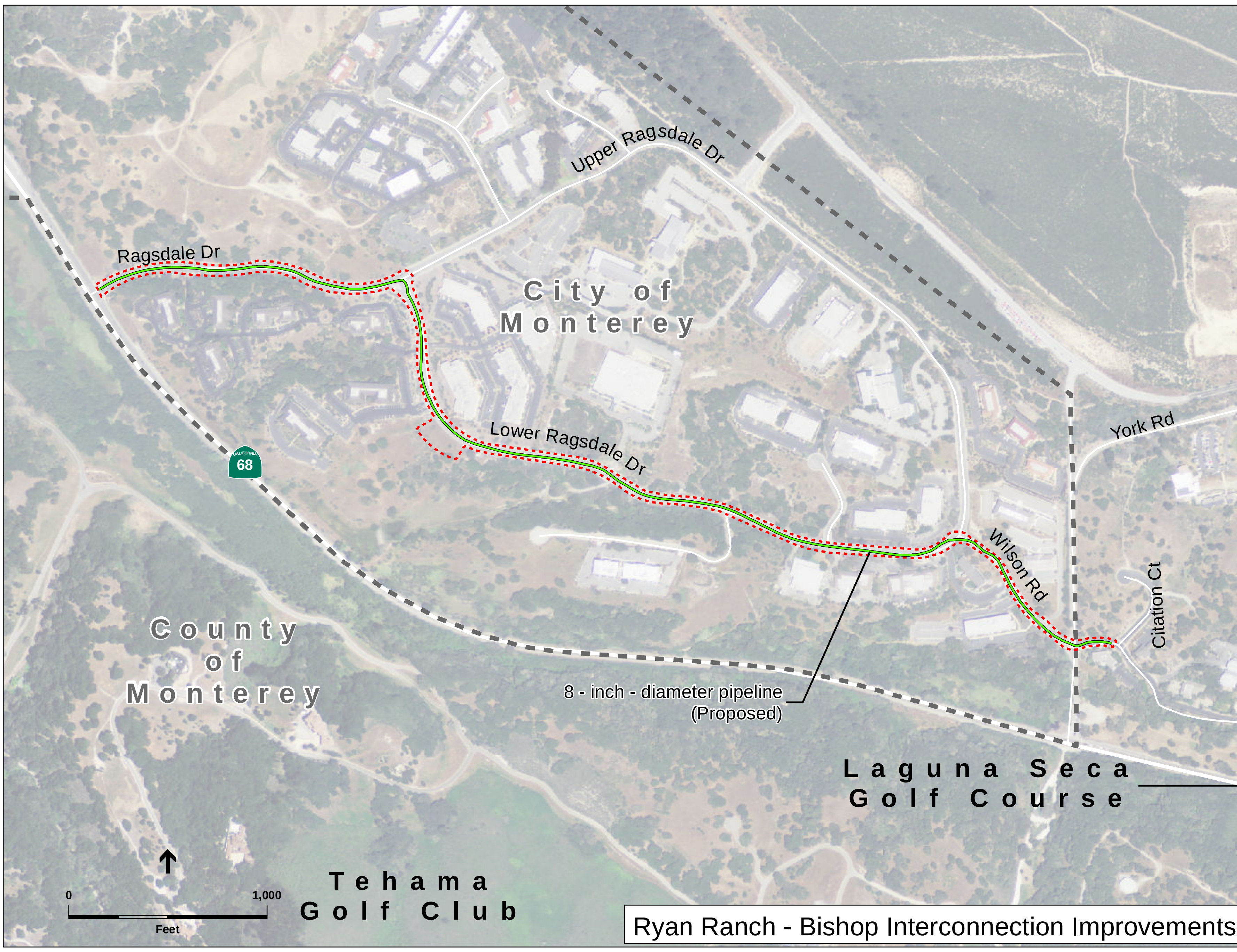
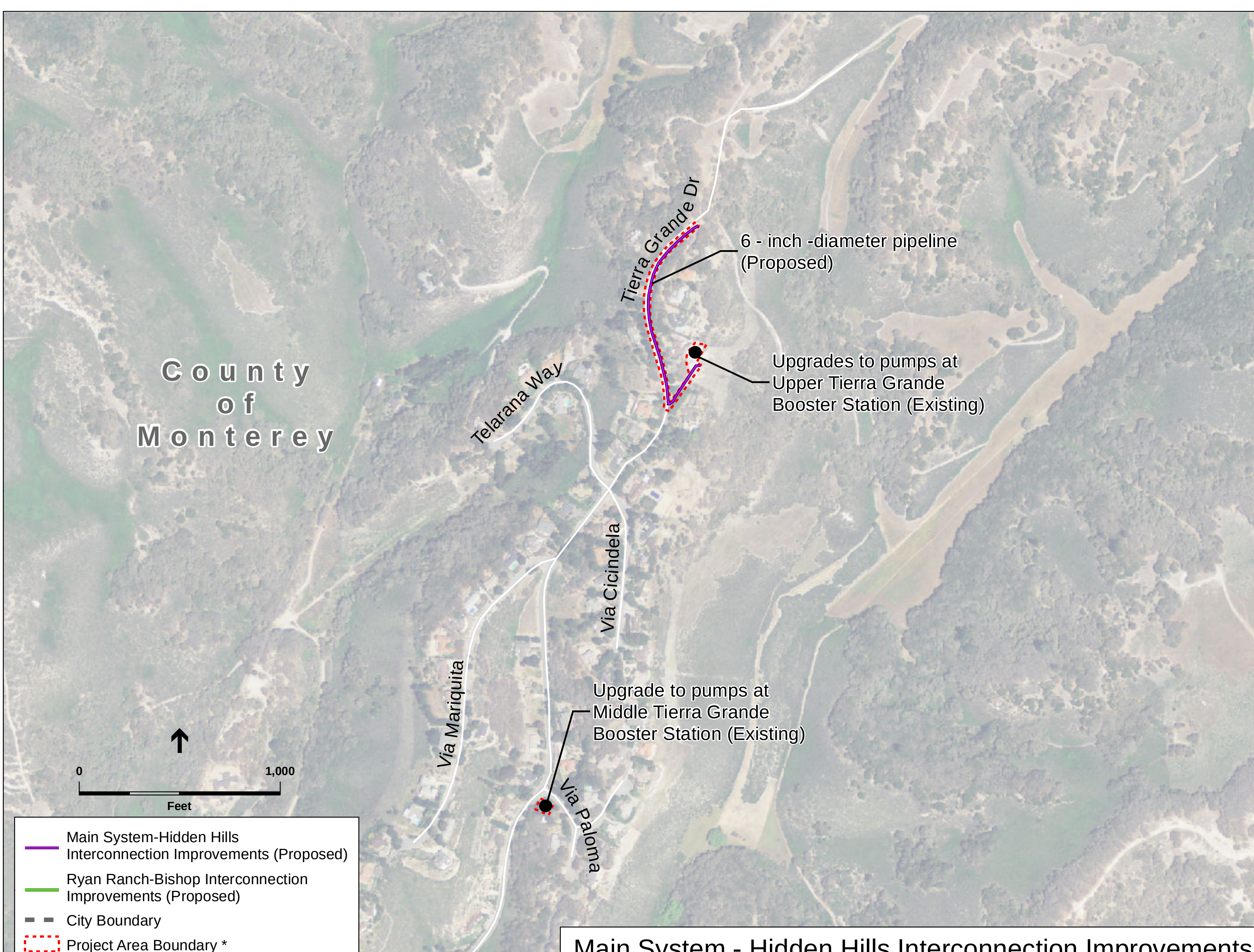
[19] Electrical transformers are used to alter a supply voltage from a primary power circuit to a secondary power circuit at the voltage desired to run a particular piece of electrical equipment. Electrical equipment running at a higher voltage is more efficient and requires smaller conduits.





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

SOURCE: ESA, 2015

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Figure 3-10
Interconnection Improvements for Highway 68 Satellite Water Systems

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3.4.4.3 ASR Conveyance Pipelines

Two parallel 0.9-mile-long, 30-inch-diameter ASR Conveyance Pipelines would extend along the east side of General Jim Moore Boulevard between existing conveyance facilities at the Coe Avenue/General Jim Moore Boulevard intersection and the proposed ASR-5 and ASR-6 Wells at the Fitch Park military housing area (see **Figure 3-7**). CalAm would use the ASR Conveyance Pipelines to convey Carmel River supplies and desalinated product water to the new ASR injection/extraction wells for injection into the Seaside Groundwater Basin, and to convey extracted ASR supplies to existing facilities. ASR product water would be conveyed via existing and proposed facilities to the Terminal Reservoir for storage, or directly to the distribution system for immediate delivery to CalAm customers.

3.4.4.4 ASR Pump-to-Waste System

Routine maintenance of the proposed Wells ASR-5 and ASR-6 would involve backflushing sediment and turbid water from the two wells using a pump-to-waste system. The proposed ASR Pump-to-Waste System would include a 4,800-square-foot, 12-foot-deep ASR Settling Basin at the Fitch Park military housing area, between the sites for Wells ASR-5 and ASR-6, and a 0.9-mile-long, 16-inch-diameter ASR Pump-to-Waste Pipeline extending between the new wells and the existing pump-to-waste system for the Phase I ASR injection/extraction wells located at the intersection of General Jim Moore Boulevard and Coe Avenue. The ASR Pump-to-Waste Pipeline would be aligned along the east side of General Jim Moore Boulevard, parallel to the ASR Conveyance Pipelines. Effluent containing elevated levels of sediment and turbidity would be conveyed through the proposed ASR Pump-to-Waste Pipeline to the ASR Settling Basin, or to the existing settling basin for the Phase I facilities. The water discharged to the ASR settling basins would infiltrate into the ground. The proposed ASR Settling Basin would have a capacity of 2.2 acre-feet, which would allow for pump-to-waste discharges of up to 3,000 gpm for 4 hours. The sediment in the settling basin would periodically need to be removed and disposed of at an appropriate disposal site.

3.4.5 Electrical Power Facilities

The electrical power demand for operation of the proposed project facilities is estimated to be approximately 49 million kilowatt hours per year (kWhrs/yr) (RBF Consulting, 2013c). Although CalAm is exploring potential opportunities to use renewable energy sources to power the proposed project facilities, this EIR assumes that all electrical power for the proposed facilities, including the MPWSP Desalination Plant and Seawater Intake System, would be provided via new connections to the local PG&E grid. New underground and aboveground powerlines would be constructed between existing powerlines in the area and the proposed project facilities. Approximately 480 feet of underground powerline would be installed within the 25-acre MPWSP Desalination Plant site to connect the MPWSP Desalination Plant to the existing PG&E powergrid located at the north end of the site. In addition, electrical transformers would be installed at the MPWSP Desalination Plant site, the ASR-5 and ASR-6 Well sites, ASR Pump Station/Terminal Reservoir, and Valley Greens Pump Station.

3.5 Project Construction

Construction activities would include site grading and excavation; well drilling and well development; installation of prefabricated components (e.g., pretreatment and RO facilities, storage tanks, etc.); construction of desalination, electrical, pump, and chemical buildings; construction of pipelines; installation of overhead and underground powerlines; and disposal of construction waste and debris. Construction equipment and materials associated with the Seawater Intake System, MPWSP Desalination Plant, and ASR injection/extraction wells would be stored within the respective construction work areas. Construction equipment and materials associated with pipeline installation would be stored along the pipeline easements and at nearby designated staging areas. Staging areas would not be sited in sensitive areas such as riparian or critical habitat for protected species. To the extent feasible, parking for construction equipment and worker vehicles would be accommodated within the construction work areas and on adjacent roadways. **Table 3-4** provides assumptions regarding project construction activities.

3.5.1 Construction of Subsurface Slant Wells

All construction activities associated with all subsurface slant wells would occur above the maximum high-tide elevation and in previously disturbed areas. Slant well construction would take approximately 18 months to complete, and could take place anytime throughout the 2.5-year construction duration for the permanent facilities (30 months total). Construction activities associated with installation of the nine additional subsurface slant wells,[20] including staging, materials storage, and stockpiling, would temporarily disturb approximately 9 acres (approximately 1 acre of disturbance per slant well). Construction activities would occur 24 hours a day, 7 days a week, with multiple slant wells being constructed simultaneously. Construction-related trucks and vehicles would access the slant well site via Del Monte Boulevard, Lapis Road, and existing access roads in the CEMEX active mining area.

The proposed slant wells would be constructed using dual-wall, reverse-circulation drilling rig; pipe trailers; portable drilling fluid tanks; Baker tanks (portable holding tanks); haul trucks; flatbed trucks; pumps; and air compressors. Drilling fluids, such as bentonite mud and foam, would not be used to install the subsurface slant wells; only the water already present in the geologic material being drilled through, and possibly additional potable water, would be used to circulate the drill cuttings. Effluent generated during slant well drilling, construction, and development would be placed in Baker tanks to allow sediment to settle out, and then percolated into the ground at the CEMEX active mining area. Drilling spoils generated during slant well construction would be spread within the construction disturbance area and are not expected to require offsite disposal.

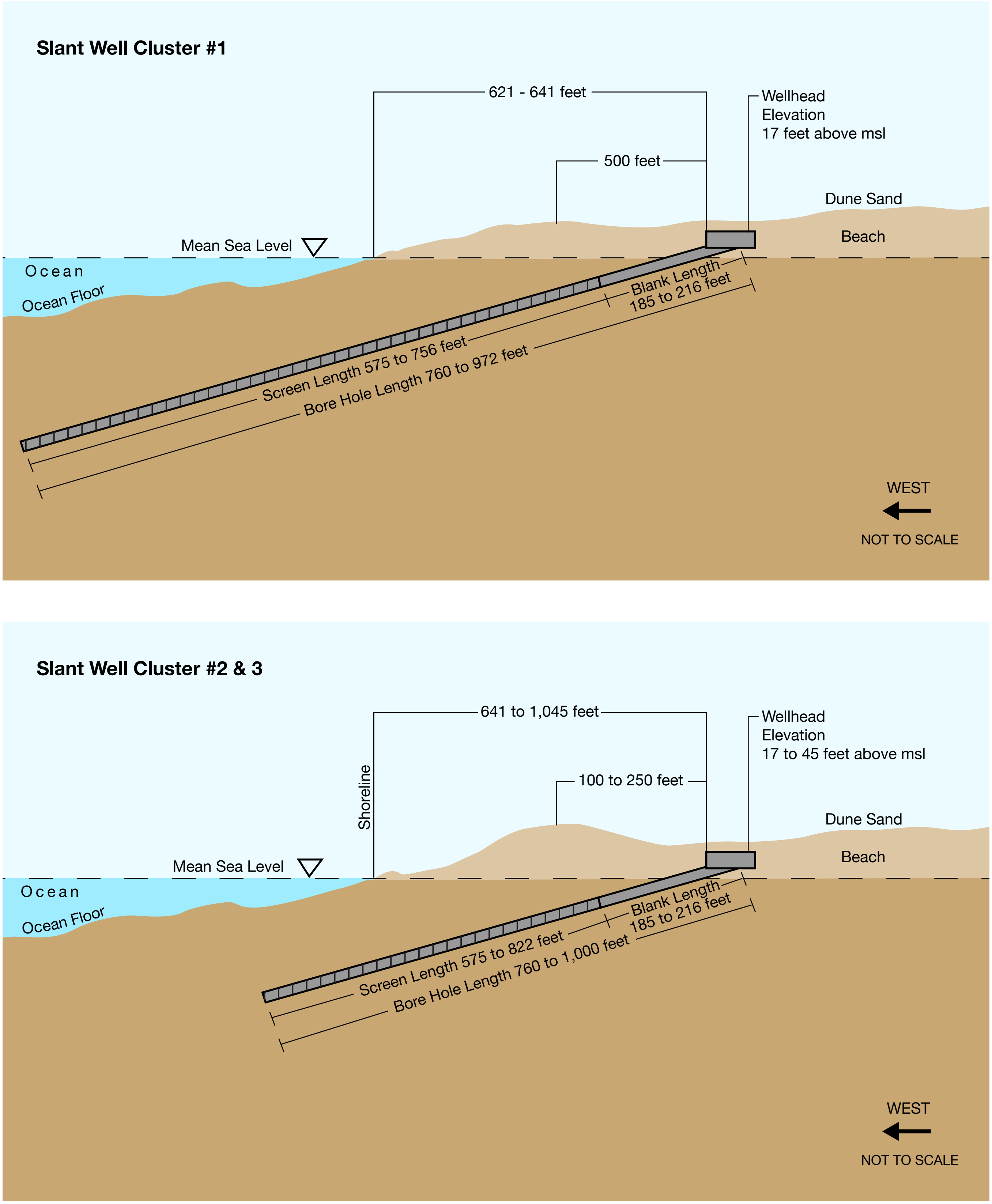
[20] As discussed in Section 3.1, above, one of the slant wells—the test slant well—was constructed in January 2015 and is not part of the proposed project being evaluated in this EIR. If the results of the pilot program confirm that subsurface slant wells in the CEMEX active mining area would provide a reliable source water supply for the MPWSP Desalination Plant, CalAm proposes to convert the test slant well into a permanent well and operate it as part of the Seawater Intake System.

TABLE 3-4
ASSUMPTIONS FOR PROJECT CONSTRUCTION

Project Component(s)	Total Excess Spoils and Construction Debris (cubic yards)	Construction Equipment		Construction Durations and Work Hours
Subsurface Slant Wells (nine permanent wells, not including the test slant well), Electrical Conduit, and Electrical Control Building	0 cy	• Drilling rig • Pipe trailers • Portable drilling fluid tanks • Flatbed trucks • Haul trucks	• Baker tank(s) • Cranes • Air compressors • Pipe cutting and welding equipment	Construction of the nine permanent slant wells and associated facilities could occur anytime during the 30-month construction duration but would take approximately 18 months total. Slant well construction would require 24-hour construction activities.
MPWSP Desalination Plant	0 cy	• Excavators • Backhoes • Air compressors • Loaders • Boom trucks • Cranes • Pavers and rollers • Bulldozers	• Concrete transport trucks • Concrete pump trucks • Flatbed trucks • Generators • Pickup trucks • Trucks for materials delivery	The MPWSP Desalination Plant would be constructed over a 25-month period. 24-hour construction activities would be required.
Pipelines: a) Source Water Pipeline b) Desalinated Water Pipeline c) Transmission Main d) Monterey Pipeline e) Transfer Pipeline f) ASR Conveyance Pipelines g) Salinas Valley Return Pipeline h) Brine Discharge Pipeline i) ASR Pump-to-Waste Pipeline	a) 1,573 cy b) 5,378 cy c) 9,967 cy d) 10,680 cy e) 3,333 cy f) 0 cy g) 782 cy h) 1,078 cy i) 0 cy **Total for all pipelines = 33,766 cy**	• Flatbed trucks • Backhoes • Excavators • Pipe cutting and welding equipment • Haul trucks for spoils transport • Trucks for materials delivery • Compaction equipment	• Baker tank(s) • Pickup trucks • Arc welding machine • Generators • Air compressors • 80-ton crane • Skip loader • Pavers and rollers	Multiple pipelines would be constructed simultaneously. To the extent feasible, pipeline installation and associated construction activities would occur during daytime hours. This EIR assumes installation of the Transfer Pipeline, ASR Conveyance Pipelines, and ASR Pump-to-Waste Pipeline would occur during daytime hours; however, other pipelines could require nighttime construction at certain locations to expedite pipeline installation and meet the project schedule. Pipeline installation would occur at a rate of approximately 150 to 250 feet/day. The expected construction duration for each pipeline is as follows: a) Source Water Pipeline – 6 months b) Desalinated Water Pipeline – 6 months c) Transmission Main – 6 months d) Monterey Pipeline – 12 months e) Transfer Pipeline – 6 months f) ASR Conveyance Pipelines – 3 months g) Salinas Valley Return Pipeline – 3 months h) Brine Discharge Pipeline – 3 months i) ASR Pump-to-Waste Pipeline – 3 months

TABLE 3-4 (Continued)
ASSUMPTIONS FOR PROJECT CONSTRUCTION

Project Component(s)	Total Excess Spoils and Construction Debris (cubic yards)	Construction Equipment		Construction Durations and Work Hours
Terminal Reservoir and Other ASR Improvements in former Fort Ord area: ASR Injection/Extraction Wells ASR Settling Basin ASR Pump Station Terminal Reservoir	280 cy	• Drill rig • Boom truck or crane • Backhoe • Air compressor • Forklift • Electrical generator • Baker tank	• Excavator • Concrete pumper, concrete truck • Paving equipment • Flatbed trucks • Haul trucks • Welding equipment	Construction of these facilities in the former Fort Ord area would take a total of approximately 18 months. With the exception of 4 weeks of 24-hour construction for each new ASR injection/extraction well during well development and completion (total of 8 weeks of 24-hour construction), construction of these facilities would occur during daytime hours.
Highway 68 Interconnection Improvements a) Ryan Ranch–Bishop b) Main System–Hidden Hills	a) 725 cy b) 250 cy	• Flatbed trucks • Backhoes • Excavators • Pipe cutting and welding equipment • Haul trucks for spoils transport • Trucks for materials delivery • Compaction equipment	• Baker tank(s) • Pickup trucks • Arc welding machine • Generators • Air compressors • 80-ton crane • Drill rig • Skip loader • Pavers and rollers	Construction of these facilities would occur during daytime hours. a) Ryan Ranch–Bishop Interconnection Improvements – 1 month b) Main System–Hidden Hills Interconnection Improvements – 1 month
Valley Greens Pump Station (Both Site Options)	200 cy	• Excavator • Backhoe • Air compressor • Boom truck or small crane • Generator	• Concrete pump truck • Paving equipment • Flatbed truck • Pavers and rollers • Welding equipment • Baker tank	Construction would occur during daytime hours for approximately 2 months.
Total Excess Spoils and Construction Debris =	**Approximately 35,225 cy**			**Overall Construction Schedule =** **October 2016 through March 2019 (30 months total)**



SOURCE: ESA, 2015

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Figure 3-11
Cross-Sectional View of
Subsurface Slant Wells

The wellheads in each slant well cluster would be enclosed within an estimated 20-foot-wide, 30-foot-long, and 10-foot-deep precast concrete vault buried below ground with top of vault at grade. The slant wells would drilled first at an angle from the ground surface with the wellhead vaults installed over slant wells after drilling is complete. The slant wells would be completed using telescoping casing ranging from 30-inch through 24-inch diameters and stainless-steel well screens in sizes from 20-inch to 12-inch. A submersible pump would be lowered into each well. Each well would be pumped for four to six week periods during slant well completion and initial well testing.

3.5.2 Site Clearing and Preparation

Before construction mobilization associated with the MPWSP Desalination Plant, pipeline installation, and the proposed ASR facilities, the contractors would clear and grade construction areas (including temporary staging areas), and remove vegetation and debris as necessary, to provide a relatively level surface for the movement of construction equipment. Workers would clear the construction work areas in stages as construction progresses to limit soil erosion. In addition to grading the ground surface, the contractor might need to mow or place gravel over staging areas for fire prevention. Upon completion of construction activities, the construction contractor would remove any added gravel, contour the construction work areas and staging areas to their original profile, and hydroseed or repave the areas, as appropriate.

3.5.3 Desalination Plant Construction

Construction workers would access the MPWSP Desalination Plant site via Charles Benson Road and existing access roads. Construction activities would include cutting, laying, and welding pipelines and pipe connections; pouring concrete footings for foundations, tanks, and other support equipment; constructing walls and roofs; assembling and installing major desalination process components; installing piping, pumps, storage tanks, and electrical equipment; testing and commissioning facilities; and finish work such as paving, landscaping, and fencing the perimeter of the site. Construction equipment would include excavators, backhoes, graders, pavers, rollers, bulldozers, concrete trucks, flatbed trucks, boom trucks and/or cranes, forklifts, welding equipment, dump trucks, air compressors, and generators. Pretreatment, RO, and post-treatment facilities would be prefabricated and delivered to the site for installation. Approximately 25 acres of the 46-acre site would be disturbed during construction. Construction activities at the desalination plant site are expected to occur over 25 months. Refer to Sections 3.5.5 and 3.5.6, below, for a description of construction activities associated with pump stations and storage tanks.

3.5.4 Pipeline Construction

As part of project construction, workers would install over 30 miles of pipelines within or adjacent to roads and recreational trails. Pipeline installation would generally progress at a rate of 150 to 250 feet per day. Most pipeline segments would be installed using conventional open-trench technology; however, where it is not feasible or desirable to perform open-cut trenching, trenchless methods would be used.

Typical construction equipment for pipeline installation would include flatbed trucks, backhoes, excavators, pipe cutting and welding equipment, haul trucks for spoils transport, trucks for materials delivery, compaction equipment, Baker tanks, pickup trucks, arch welding machines, generators, air compressors, cranes, drill rigs, and skip loaders. Pipeline segments would typically be delivered and installed in 6- to 40-foot-long sections. Soil removed from trenches and pits would be stockpiled and reused, to the extent feasible, or hauled away for offsite disposal. Under typical circumstances, the width of the disturbance corridor for pipeline construction would vary from 50 to 100 feet, depending on the size of the pipe being installed. Trenchless technologies could require wider corridors at entry and exit pits. Pipeline installation would be ongoing throughout the entire 30-month construction period, with multiple pipelines being installed simultaneously. Pipeline installation would be sequenced to minimize land use disturbance and disruption to the extent possible.

3.5.4.1 Open-Trench Construction

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

3.5.4.2 Trenchless Technologies

Where it is not feasible or desirable to perform open-cut trenching, trenchless methods such as jack-and-bore, drill-and-burst, horizontal directional drilling, and/or microtunneling would be employed. Pipeline segments located within heavily congested underground utility areas or in sensitive habitat areas would likely be installed using horizontal directional drilling or microtunneling. Jack-and-bore methods would also be used for pipeline segments that cross beneath Highway 1 or drainages.

Jack-and-Bore and Microtunneling Methods

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

Drill-and-Burst Method

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

Horizontal Directional Drilling

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

3.5.4.3 Disinfection of Existing and Newly Installed Pipelines

Prior to constructing connections between existing and new pipelines, existing pipe segments would be drained and later disinfected prior to being put into service. Similarly, upon completing construction activities, facility operators would disinfect the newly installed pipelines and pipeline connections before bringing the pipes into service. Effluent produced during the pipeline disinfection process would be discharged to the local stormwater drainage system in accordance with the Central Coast Regional Water Quality Control Board (RWQCB) *General Waste Discharge Requirements for Discharges with Low Threat to Water Quality* (Order No. R3-2011-0223, NPDES Permit No. CAG993001) (RWQCB, 2011). See Impact 4.3-3 in Section 4.3, Surface Water Hydrology and Water Quality, for additional information.

3.5.5 Construction of Pump Stations

Two pump stations would be constructed under the proposed project: the Valley Greens Pump Station and the ASR Pump Station. Construction crews would prepare the pump station sites by removing vegetation and grading the sites to create a level work area. Construction activities would include pouring concrete footing for foundations; assembling and installing piping, pumps, and electrical equipment; constructing concrete enclosures and roofs; and finish work such as paving, landscaping, and fencing the perimeter of the pump station sites. Construction access would be provided via existing access roads and roadways.

The 2,000-square-foot ASR Pump Station would be constructed on the same concrete pad as the Terminal Reservoir. It is assumed that the entire 7-acre Terminal Reservoir site could be disturbed during project construction activities.

Construction of the Valley Greens Pump Station would result in approximately 2,000 square feet of temporary disturbance and 600 square feet or permanent disturbance.

3.5.6 Tank Construction

This section describes the tank construction methods that would be used for construction of the filtered water equalization tanks, clearwells, and Terminal Reservoir. Construction contractors would clear and grade the tank sites and pour concrete foundations to stabilize the tanks. The tanks themselves would be constructed from rolled steel plates, reinforced concrete, or post-tension concrete.

For tanks made of rolled steel plates, the construction contractor would weld the steel plates, erect the plates into place, and then paint the tanks. For tanks made of reinforced concrete, the contractor would erect formwork, place steel reinforcements inside the form, and then pour concrete into the form. The form would be removed once the concrete sets. For tanks made of post-tension concrete, the contractor would erect a steel form and apply shotcrete to both sides (outer and inner walls) of the steel form. Post-tension steel wire would then be wrapped around the tank. For tanks made of reinforced concrete and post-tension concrete, painting would be optional.

As stated above in Section 3.4.3.6, security chain-link fencing would enclose the 7-acre Terminal Reservoir and ASR Pump Station site.

3.5.7 Construction of ASR Injection/Extraction Wells

Construction activities for the installation of the new ASR injection/extraction wells would include grading; installation and removal of temporary noise attenuators (sound walls); well drilling; installation of pipeline connections to the proposed ASR Conveyance Pipelines along General Jim Moore Boulevard; and installation of electrical equipment and pumps. Construction equipment would include drill rigs, water tanks, pipe trucks, flatbed trucks, and several service vehicles. The new ASR injection/extraction wells would be drilled using reverse rotary drills. Bentonite drilling fluids would not be used during well drilling; however, non-corrosive, environmentally inert, biodegradable additives might be used to keep the borehole open. Construction activities would normally extend from 7 a.m. to 7 p.m., 5 days a week; however, continuous 24-hour construction would be necessary for approximately 4 weeks for each well during well completion and initial well testing.

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

3.5.8 Installation of Overhead Powerlines

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

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

3.5.9 Spoils Management and Disposal

Excavation and construction activities would generate excess soil, rock material, and construction debris. Although suitable topsoil and subsoils excavated during construction would be used to backfill excavations and restore work areas, it is estimated that project construction would generate approximately 35,225 cubic yards of excess material requiring offsite disposal. The average capacity of haul trucks is assumed to be 10 cubic yards. Spoils hauling and placement would occur throughout the 30-month construction schedule.

3.5.10 Construction Schedule

The proposed project facilities are expected to be constructed over approximately 30 months, from October 2016 through March 2019. Most construction activity associated with installation of the nine permanent subsurface slant wells in the CEMEX active mining area would occur in 6-month increments over a total of 18 months; however, slant well construction could occur anytime during the 30-month construction period. It is assumed that construction activities for the slant wells would occur for up to 24 hours a day, 7 days a week.

Construction activities at the MPWSP Desalination Plant site would take place over 25 months. To meet the project schedule and as otherwise needed, it is assumed that construction activities at the MPWSP Desalination Plant site could occur up to 24 hours a day, 7 days a week.

Construction of pipelines and associated conveyance facilities would occur throughout the 30-month construction period, with multiple pipelines being constructed simultaneously. To the extent feasible, pipeline installation would generally be conducted during daytime hours and within noise ordinance time limits. This EIR assumes installation of the Transfer Pipeline, ASR Conveyance Pipelines, and ASR Pump-to-Waste Pipeline would occur during daytime hours. However, other pipelines could require nighttime construction to meet the schedule.

Construction of the proposed Terminal Reservoir and ASR Pump Station would occur over 18 months. Construction of Wells ASR-5 and ASR-6 and ASR Settling Basin is expected to take approximately 12 months. With the exception of well completion and development, it is assumed that all other construction activities in the former Fort Ord area would occur during daytime hours. Each ASR injection/extraction well would require continuous 24-hour construction for up to 4 weeks during well completion and development (total of 8 weeks of 24-hour construction).

Construction of the Ryan Ranch–Bishop Interconnection Improvements and Main System–Hidden Hills Interconnection Improvements are expected to take approximately 1 month each. Construction of the Valley Greens Pump Station is also expected to take 2 months. Construction activities for these facilities would occur during daytime hours.

3.6 Project Operations and Maintenance

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

It is expected that the subsurface slant wells and MPWSP Desalination Plant would be operated 24 hours a day, 365 days per year. The seawater intake wells would generally be operated remotely using SCADA systems. Up to eight subsurface slant wells would be operated at any given time, with each well producing approximately 3 mgd of source water for the MPWSP Desalination Plant for a combined total of up to 24.1 mgd of source water each day. At least two wells would be maintained on standby. It is assumed that approximately 25 to 30 facility operators and support personnel would be present onsite 24 hours per day to operate the desalination facilities.

The MPWSP Desalination Plant would operate at an overall recovery rate of 42 percent. Approximately 24.1 mgd of raw seawater would be needed to produce 9.5 mgd of desalinated product water. For a desalination plant that produces 9.5 mgd, the RO process would generate approximately 13.98 mgd of brine (including 0.4 mgd of decanted waste effluent). The salinity of the brine is expected to range between 57 and 58 ppt[21] (roughly 71 to 74 percent higher than seawater) (Flow Science, 2014). The brine stream would be discharged to Monterey Bay via the existing MRWPCA ocean outfall and diffuser. During wet periods, the brine stream would be blended with treated wastewater effluent from the MRWPCA Regional Wastewater Treatment Plant prior to discharge. However, the brine stream could be discharged without dilution for extended periods during dry months when all of the treated wastewater effluent is reclaimed for agricultural irrigation. It is assumed that the amount of treated wastewater effluent available for blending would be highly variable throughout the year.

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

The MRWPCA's 1,100-foot-long diffuser is equipped with 172 ports (120 ports are open and 52 are closed), each 2 inches in diameter and spaced 8 feet apart. The diffuser would serve to disperse the brine stream at the discharge point, thereby minimizing salinity differences between the discharges and surrounding seawater. Sections 4.3, Surface Water Hydrology and Water Quality, and 4.5, Marine Resources, describe the modeling and analysis performed for brine discharges under the proposed project.

Table 3-5 provides an overview of typical facility operations under the proposed project. **Table 3-6** summarizes typical operations for the proposed project based on average monthly flow conditions.

TABLE 3-5
OVERVIEW OF TYPICAL FACILITY OPERATIONS – PROPOSED PROJECT

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

SOURCE: RBF Consulting, 2013a.

Over the life of the project, there would be periods when the MPWSP Desalination Plant would need to be shut down for a host of reasons (i.e., mechanical or electrical problems, water quality issues, loss of power, etc.). After a shutdown, CalAm might operate the plant with all RO modules in service (at the plant's maximum production capacity of 11.2 mgd) to catch up on production; however, the total annual production would not exceed an average of 9.5 mgd (Svindland, 2014). **Table 3-7** provides a comparative example of MPWSP Desalination Plant typical daily operations versus operations following a 2-day shutdown. As shown in the example, any fluctuations in daily production would not affect total monthly production.

The slant wells would require periodic maintenance every 5 years. During maintenance, workers would excavate and expose the wellheads. Mechanical brushes would be lowered into the wells to mechanically clean the screens. If chemical cleaning products are needed for maintenance, only environmentally inert products would be used. The beach disturbance area associated with periodic maintenance of the subsurface slant wells is expected to be similar to the disturbance associated with construction of the slant wells (roughly 10 acres).

Each wellhead and vault would be excavated and uncovered for 1 to 2 weeks during well cleaning operations. Accounting for all slant wells, the total duration of maintenance activities within the beach area would be between 9 and 18 weeks. Maintenance activities would be conducted between October and February to avoid the nesting season for snowy plover. Maintenance workers would access the slant wells via the existing CEMEX access road (RBF Consulting, 2013a).

TABLE 3-6
TYPICAL OPERATIONS BASED ON AVERAGE MONTHLY FLOWS – PROPOSED PROJECT

	Average Monthly Flow (mgd)												Total (afy)[a]
	Jan	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	
Average Demand	10.3	10.5	11.4	12.8	15.5	16.6	17.3	17.1	16.8	13.3	11.8	10.3	15,300
Water Returned to Salinas Valley	0.0	0.0	0.0	0.0	2.4	1.4	1.4	1.4	1.4	1.3	0.0	0.0	876
System Supplies													
Carmel River to Distribution System	5.9	5.2	5.7	5.1	2.2	1.0	1.0	1.0	1.0	1.0	1.0	6.0	3,376
Seaside GW Production Wells to Distribution System	0.0	0.0	0.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	0.5	0.0	770
Sand City Desalinated Supplies to Distribution System	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	94
Supplies Extracted from Seaside Groundwater Basin (via ASR)	0.0	0.0	0.0	0.0	5.0	6.3	7.0	6.8	6.5	2.9	1.8	0.0	3,400
MPWSP Desalinated Supplies to Distribution System	4.3	5.2	5.6	6.6	7.1	8.1	8.1	8.1	8.1	8.2	8.5	4.2	7,665
Total Supplies to Distribution System	**10.3**	**10.5**	**11.4**	**12.8**	**15.5**	**16.6**	**17.3**	**17.1**	**16.8**	**13.3**	**11.8**	**10.3**	**15,304**
MPWSP Desalination Plant Operations													
Desalinated Supplies for Distribution System	4.3	5.2	5.6	6.6	7.1	8.1	8.1	8.1	8.1	8.2	8.5	4.2	7,665
Desalinated Supplies for ASR Injection	5.2	4.3	3.9	2.9	0.0	0.0	0.0	0.0	0.0	0.0	1.0	5.3	2,100
Desalinated Supplies for Salinas Valley	0.0	0.0	0.0	0.0	2.4	1.4	1.4	1.4	1.4	1.3	0.0	0.0	8765
Total Desalinated Supplies	**9.5**	**9.5**	**9.5**	**9.5**	**9.5**	**9.5**	**9.5**	**9.5**	**9.5**	**9.5**	**9.5**	**9.5**	**10,641**
Supplies Extracted from Seaside Groundwater Basin (via ASR)													
Carmel River	0.0	0.0	0.0	0.0	1.9	2.4	2.7	2.6	2.5	1.1	0.7	0.0	1,300
Desalinated Supplies	0.0	0.0	0.0	0.0	3.1	3.9	4.3	4.2	4.0	1.8	1.1	0.0	2,100
Total Extraction	**0.0**	**0.0**	**0.0**	**0.0**	**5.0**	**6.3**	**7.0**	**6.8**	**6.5**	**2.9**	**1.8**	**0.0**	**3,400**

[a] Annual totals were calculated from the estimated monthly operations shown here and may differ from annual information presented in text due to rounding.

SOURCE: RBF Consulting, 2013a.

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

Week	Daily Production (mgd)						
	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Normal Operations							
1	9.5	9.5	9.5	9.5	9.5	9.5	9.5
2	9.5	9.5	9.5	9.5	9.5	9.5	9.5
3	9.5	9.5	9.5	9.5	9.5	9.5	9.5
4	9.5	9.5	9.5	9.5	9.5	9.5	9.5
						Total Monthly Production =	**266 mgd**
Operations Before and After 2-Day Shutdown							
1	9.5	9.5	9.5	9.5	9.5	9.5	9.5
2	9.5	****2-Day Shutdown****		11.2	11.2	11.2	11.2
3	11.2	11.2	11.2	11.2	11.2	11.2	11.2
4	9.5	9.5	9.5	9.5	9.5	9.5	9.5
						Total Monthly Production =	**266 mgd**

SOURCE: Svindland, 2014.

3.6.2 Operation of the ASR System

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

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

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

CalAm would rely primarily on any of the six ASR injection/extraction wells (Phases I, II, and III of the ASR system) to recover the banked water. In addition, to increase operational flexibility and depending on demand, CalAm would also use existing groundwater production wells in the Seaside Groundwater Basin to recover the banked water. Extraction via existing production wells would be subject to certain operating rules to avoid causing changes in the hydraulic gradient or exacerbating localized depressions (see Section 4.4, Groundwater Resources, for more specific information regarding the ASR operating rules that would apply to the proposed project):

- Seaside Groundwater Basin annual monitoring reports prepared by Seaside Groundwater Basin Water Master would be reviewed yearly to identify the current location of the groundwater depression in the Santa Margarita Formation, the aquifer unit where the ASR system water would be banked.
- CalAm's use of existing groundwater production wells to recover water stored in the ASR system would be limited to those production wells in the northern subbasin located east of the center point of the groundwater depression. Restricting extraction to the eastern side of the groundwater depression would allow CalAm to extract the banked water before it migrates into the depression and would, therefore, avoid affecting the groundwater depression.
- The order of preference for using the groundwater production wells for extraction of banked water would be based on their proximity to the ASR injection wells; the first priority would be any of the ASR wells, followed in order by the Paralta, Ord Grove #2, Luzern #2, and Playa #3 Wells.[22]
- Existing groundwater production wells located outside of the northern subbasin of the Seaside Groundwater Basin (Plumas #4 Well) would not be used to recover banked water because these wells are not in direct hydraulic communication with the aquifer where the ASR water would be stored (CalAm, 2014b).

The stored water would be pumped out of the groundwater basin and conveyed through the other ASR Conveyance Pipeline to the CalAm distribution system for direct delivery to customers in Seaside or to the Terminal Reservoir for subsequent conveyance and delivery to customers located in other portions of the Monterey District service area. Water extracted from the ASR system would be disinfected to meet drinking water requirements prior to distribution to customers.

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

Similar to operations for the existing ASR injection/extraction wells, facility operators would regularly backflush accumulated sediment and turbid water from the ASR-5 and ASR-6 Wells. The duration of backflushing would range from a few minutes to 2 hours. Water produced during routine backflushing of the proposed ASR-5 and ASR-6 Wells would be routed to the proposed ASR Settling Basin and percolated into the ground, or conveyed via the new ASR Pump-to-

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

Waste Pipeline to the existing Phase I ASR Pump-to-Waste System located at the intersection of General Jim Moore Boulevard and Coe Avenue.

3.6.3 Product Water Conveyance Facilities

3.6.3.1 Routine Maintenance of Pump Stations and Pipelines

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

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

3.6.3.2 Interconnections for Highway 68 Satellite Systems

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

3.6.4 Payback to Seaside Groundwater Basin

As part of the adjudication of the Seaside Groundwater Basin, CalAm is obligated to provide replenishment water supplies to the basin in an amount equivalent to the quantity of water that CalAm previously pumped in excess of the basin's natural safe yield.[23] In November 2012, the Seaside Groundwater Basin Watermaster and CalAm tentatively agreed to a replenishment schedule of 25 years at a replenishment rate of 700 afy, based on a running 5-year water-year average. CalAm would meet its obligations via in-lieu recharge or artificial replenishment. Depending on fluctuations in precipitation and water supplies, the actual volume of water replenished during any given year would vary but would be equal to or greater than 700 afy based on a running 5-year average (Seaside Groundwater Basin Watermaster, 2012).

3.6.5 Power Demand

CalAm's current electrical power demand associated with its existing water production facilities (primarily Carmel River and Seaside Groundwater Basin production wells) is approximately 7,700 megawatt hours (MWh) per year, which represents the baseline electrical demand for the proposed project. CalAm's operational electrical power demand for water production under the

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

proposed project (including water produced from the MPWSP Desalination Plant, Seaside Groundwater Basin production wells, ASR system, and the Carmel River) is estimated to be approximately 48,200 MWh per year. Therefore, the net increase in annual electrical power demand for water production would be approximately 40,500 MWh per year (CalAm, 2014c). It is assumed that electrical power for all of the proposed project facilities would be provided via the PG&E power grid.

The MPWSP would incorporate energy recovery from the brine stream using pressure-exchanger technology.[24] Energy recovery is a process through which the energy contained in pressurized brine flow is transferred to a portion of the RO source water to lower source water pumping requirements and thus lower overall energy consumption. Under the proposed project, energy recovery using pressure-exchanger technology is expected to significantly reduce overall energy consumption during the RO process.

3.7 Permits, Approvals, and Regulatory Requirements

This EIR is intended to inform decision-makers of the environmental consequences associated with implementation of the proposed MPWSP. In addition, the proposed project would be subject to various regulations and could require discretionary permits from federal, state, and local jurisdictions. **Table 3-8** summarizes the permits and authorizations that would likely be required to construct, operate, and maintain the proposed project. Project consistency with specific applicable state, regional, and local plans relevant to the topics covered in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, is presented within each topical section.

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

TABLE 3-8
ANTICIPATED PERMITS AND APPROVALS – PROPOSED PROJECT

Agency or Department	Permit or Approval	Discussion
Federal Agencies – *Consultations with federal agencies could be required if the proposed project is subject to a federal permit, such as a Clean Water Act Section 404 permit.*		
U.S. Army Corps of Engineers (Corps)	Permit in accordance with Clean Water Act Section 404 (33 USC 1344)	• Projects that would discharge dredged or fill material into waters of the United States, including wetlands, require a Corps permit under Clean Water Act Section 404.
U.S. Fish and Wildlife Service (USFWS)	Biological Opinion in accordance with Section 7 of the Federal Endangered Species Act (FESA)	• CalAm may be required to consult with the USFWS to determine whether the proposed action is likely to adversely affect a federally listed terrestrial or freshwater animal or plant species under USFWS jurisdiction, or the designated critical habitat for such species; jeopardize the continued existence of such species that are proposed for listing under FESA; or adversely modify proposed critical habitat. To make this determination, the project applicant must prepare a Biological Assessment, the outcome of which determines whether the USFWS will conduct "formal consultation" and issue a Biological Opinion concerning the effects of the project. If the USFWS finds that the project may jeopardize the species or destroy or modify critical habitat, reasonable and prudent alternatives to the action must be considered.
	Incidental Take Permit in accordance with FESA Section 7, as amended (16 USC 1531 et seq.)	• The "incidental take" of a federally listed species under USFWS jurisdiction requires the issuance of an Incidental Take Statement under Section 7 of FESA. (If the project is not subject to a federal permit, the incidental take of a federally listed species under USFWS jurisdiction requires an Incidental Take Permit and preparation of a habitat conservation plan to be approved in accordance with FESA Section 10.)
	Incidental Take Permit in accordance with the Migratory Bird Treaty Act (16 USC 703–711)	• The incidental take of migratory birds or any part, nest, or eggs of a migratory bird also requires the issuance of an Incidental Take Permit from the USFWS.
State Historic Preservation Officer	Consultation with State Historic Preservation Officer (SHPO) and/or Tribal Historic Preservation Officer (THPO) in accordance with Section 106 of the National Historic Preservation Act of 1966 (NHPA)	• The NHPA requires federal permitting agencies to "take into account" the effects of a proposed project or action on properties included in the National Register of Historic Places or that meet National Register criteria, and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. Thus, the federal permitting agency must consult with the SHPO and/or THPO on behalf of the project applicant, as appropriate.
National Oceanic and Atmospheric Administration (NOAA)	Authorization by the superintendent of the Monterey Bay National Marine Sanctuary of federal, state, and local agencies' permits within the sanctuary in accordance with NOAA's National Marine Sanctuary Program requirements (15 CFR Part 922)	• Authorization by the Monterey Bay National Marine Sanctuary's superintendent is required for any permit, lease, license, approval, or other authorization issued or granted by a federal, state, or local agency for activities within the sanctuary. This authorization indicates that the Monterey Bay National Marine Sanctuary Advisory Council does not object to issuance of the permit or other authorization, including the terms and conditions deemed necessary to protect sanctuary resources and qualities.
	Incidental Take Permit or Incidental Harassment Authorization in accordance with Section 104 of the Marine Mammal Protection Act of 1972 (MMPA) (16 USC 1374)	• The MMPA prohibits unauthorized take of marine mammals in U.S. waters by any person and by U.S. citizens in international waters. NOAA Fisheries can authorize incidental take that occurs during non-fishery commercial activities.

TABLE 3-8 (Continued)
ANTICIPATED PERMITS AND APPROVALS

Agency or Department	Permit or Approval	Discussion
Federal Agencies (cont.)		
National Oceanic and Atmospheric Administration (NOAA) – (cont.)	Consultation and Biological Opinion in accordance with FESA Section 7	• The need for any federal permit requires the project applicant to consult with NOAA Fisheries to determine whether the proposed action is likely to adversely affect a federally listed marine species or designated critical habitat for such species, jeopardize the continued existence of such species that are proposed for listing under FESA, or adversely modify proposed critical habitat. To make this determination, the project applicant prepares a Biological Assessment, the outcome of which determines whether NOAA Fisheries will conduct "formal consultation" with the agency and issue a Biological Opinion concerning the effects of the proposed action. If NOAA Fisheries finds that the action may cause jeopardy or critical habitat destruction or modification, it will propose reasonable and prudent alternatives to the action. Alternatively, if no jeopardy is found, then the action can proceed.
	Incidental Take Statement in accordance with FESA Section 7 (16 USC 1531 et seq.)	• When a federal permit such as a Clean Water Act Section 404 permit is required, the incidental take of a federally listed species under NOAA Fisheries jurisdiction requires the issuance of an Incidental Take Statement under Section 7 of FESA. (If no federal approval is required, any incidental take of a federally listed species under this agency's jurisdiction would require an Incidental Take Permit in accordance with FESA Section 10).
State Agencies		
California Public Utilities Commission (CPUC)	Certificate of Public Convenience and Necessity (CPUC Article 1)	• Construction and operation of the proposed project and recovery of costs in connection therewith.
	Consultation with NOAA Fisheries in accordance with Section 305(b) of the Sustainable Fisheries Act (16 USC 1855[b])	• If the CPUC issues approval of a project that could adversely affect designated Essential Fish Habitat (EFH), the agency must consult with NOAA Fisheries. See related discussion provided in the context of the Corps.
Fort Ord Reuse Authority (FORA)	Finding of substantial conformance with the Base Reuse Plan and the FORA Master Resolution Chapter 8 consistency criteria	• Applications for local agency legislative land use planning approval (such as a proposed county general plan amendment) are brought before the FORA Board of Directors for a determination of consistency between the application and the Base Reuse Plan.
Central Coast Regional Water Quality Control Board (RWQCB)	Compliance with National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges of Storm Water Associated with Construction Activity (Order 2010-0014-DWQ)	• Any discharge of stormwater to surface waters of the United States from a construction project that encompasses 1 acre or more of soil disturbance requires compliance with the General Permit, including: - Development and implementation of a stormwater pollution prevention plan that specifies best management practices (BMPs) to prevent construction pollutants from contacting stormwater, with the intent of keeping all products of erosion from moving offsite into receiving waters - Elimination or reduction of non-stormwater discharges to storm sewer systems and other waters of the U.S. - Inspection of all BMPs

TABLE 3-8 (Continued)
ANTICIPATED PERMITS AND APPROVALS

Agency or Department	Permit or Approval	Discussion
State Agencies (cont.)		
Central Coast Regional Water Quality Control Board (RWQCB) (con't)	NPDES permit in accordance with Clean Water Act Section 402 (33 USC 1342)	• Discharges of brine into surface waters of the United States, including wetlands and Monterey Bay National Marine Sanctuary, requires NPDES permit approval. It is assumed that the *Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant* (Order No. R3-2014-0013, NPDES Permit No. CA0048551) would be revised to include the brine discharges from the MPWSP Desalination Plant.
	Waste Discharge Requirements in accordance with the Porter-Cologne Water Quality Control Act (Water Code Section 13000 et seq.)	• Any activity that results or may result in a discharge of waste that directly or indirectly impacts the quality of waters of the state (including groundwater or surface water) or the beneficial uses of those waters is subject to waste discharge requirements.
	Water Quality Certification in accordance with Clean Water Act Section 401 (33 USC 1341)	• Under Section 401 of the Clean Water Act, the RWQCB must certify that actions receiving authorization under Section 404 of the Clean Water Act also meet state water quality standards. Any applicant for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into navigable waters, must provide the licensing or permitting agency a certification that the activity meets state water quality standards.
California Department of Fish and Wildlife (CDFW)	Incidental Take Permit in accordance with the California Endangered Species Act (CESA) (Fish and Game Code Section 2081)	• The take of any endangered, threatened, or candidate species may be allowed by permit if it is incidental to an otherwise lawful activity and if the impacts of the authorized take are minimized and fully mitigated. No permit may be issued if the activity would jeopardize the continued existence of the species.
	Lake/Streambed Alteration Agreement (Fish and Game Code Section 1602)	• It is unlawful to substantially divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources, or to use any material from the streambeds, without first notifying the CDFW of such activity.
California Coastal Commission (CCC)	Coastal Development Permit in accordance with the California Coastal Act (PRC Section 30000 et seq.)	• Development proposed within the Coastal Zone requires a Coastal Development Permit from the CCC, except where the local jurisdiction has an approved Local Coastal Program (LCP) in place. If an approved LCP is in place, primary responsibility for issuing permits in coastal areas shifts from the CCC to the local government, although the CCC will hear appeals on certain local government coastal development decisions. • Regardless of whether a Coastal Development Permit must be obtained from a local agency in accordance with an approved LCP, the CCC retains coastal development permit authority over new development proposed on the immediate shoreline, including intake and outfall structures on tidelands, submerged lands, and certain public trust lands, and over any development that constitutes a "major public works project." (PRC Sections 30601, 30600[b][2]).

TABLE 3-8 (Continued)
ANTICIPATED PERMITS AND APPROVALS

Agency or Department	Permit or Approval	Discussion
State Agencies (cont.)		
California Department of Public Health (CDPH)	Permit to Operate a Public Water System (Health and Safety Code Section 116525)	• The CDPH has permitting authority over the operation of a public water system and provides oversight with respect to the quality of the product water produced.
California Department of Transportation (Caltrans)	Encroachment Permit (Streets and Highway Code Section 660 et seq.)	• Caltrans has permitting authority over encroachments in, under, or over any portion of a state highway right-of-way, including Highway 156, Highway 68, and Highway 1.
California Department of Toxic Substances Control (DTSC)	DTSC hazardous waste management and disposal requirements under Title 22, Division 4.5, Chapter 11, Article 3, Soluble Threshold Limits Concentrations (STLC)/Total Threshold Limits Concentrations (TTLC); Review under local regulations for digging and excavation within certain areas of the former Ft Ord.	• Soil management plans would be required by DTSC if contaminated soils are present along the pipeline alignment. Regulatory Requirements that outlines the concentrations at which soil and groundwater are determined to be a California Hazardous Waste. Title 22 would be applicable if contaminated soil or groundwater arising from trenching are determined to be a Hazardous Waste and subject to associated transport and disposal requirements. Under separate federal regulation at 40 CFR Part 261, Concentrations of soil & groundwater contamination may also be classified as a Federal Hazardous Waste. • DTSC approval is required for digging and excavation in certain portions of the former Fort Ord military base (also see City of Seaside Digging and Excavation Permit).
California State Lands Commission (CSLC)	New Land Use Lease (for portion of the subsurface slant wells located below mean high tide) and Amended Land Use Lease (for use of the MRWPCA outfall and diffuser) (PRC Section 1900)	• CSLC has jurisdiction and management authority over all ungranted tidelands and submerged lands in Monterey Bay under the Common Law Public Trust. On tidal waterways, the State's sovereign fee ownership extends landward to the mean high tide elevation.
Local Agencies		
Seaside Groundwater Basin Watermaster	Permit for Injection/Extraction	• Injection/extraction activities that would affect the Seaside Groundwater Basin require approval of the Seaside Groundwater Basin Watermaster.
City of Seaside	Digging and Excavation Permit	• Excavations greater than 10 cubic yards within an Ordinance Remediation District, in the Former Fort Ord areas require a permit in compliance with Chapter 15.34, Digging and Excavation, of the Former Fort Ord Ordinance. Permit approval is subject to requirements placed on the property by an agreement executed between the City of Seaside, FORA, and DTSC.
Monterey County Public Works Department	Encroachment Permit (Monterey County Code [MCC] Chapter 14.04)	• Designated activities within the right-of-way of a county highway require Encroachment Permit approval by the director of the Public Works Department, whose decisions may be appealed to the Monterey County Board of Supervisors.
	Tree Removal Permit	• Removal of any protected trees requires a tree removal permit in compliance with Chapter 16.60 of the County's municipal code. Removal of more than thee protected trees requires, a forest management plan as determined by the Director of Planning.

TABLE 3-8 (Continued)
ANTICIPATED PERMITS AND APPROVALS

Agency or Department	Permit or Approval	Discussion
Local Agencies (cont.)		
Monterey County Health Department, Environmental Health Division	Well Construction Permit (MCC Chapter 15.08)	• Construction of new water supply wells requires written permit approval from Monterey County's health officer, whose decisions may be appealed to the Board of Supervisors.
	Permit to Construct Desalination Facility (MCC Chapter 10.72)	• The commencement of construction or operation of a desalination treatment facility requires permit approval from Monterey County's director of environmental health or his/her designee (MCC Section 10.72.010). Permit decisions may be appealed to the director of environmental health within 30 days (MCC Section 10.72.080).
Monterey County Planning and Building Inspection Department	Conditional Use Permit (MCC Chapter 21.74)	• Under the terms of Monterey County's Zoning Ordinance, a use permit must be issued by the appropriate planning authority (e.g., the zoning administrator or the Planning Commission) to create a use for which a conditional use permit is required or allowed in a particular zone. The permit decisions may be respectively appealed to the Planning Commission or the Board of Supervisors.
	Coastal Development Permit in accordance with the California Coastal Act (PRC Section 30000 et seq.)	• A permit must be obtained for development proposed in the Coastal Zone where the County has jurisdiction through its existing Local Coastal Program, except in the instances noted above, where the CCC retains primary permit authority. Where the County is the permitting authority, the CCC retains jurisdiction over appeals.
	Grading Permit (MCC Chapter 16.08)	• Grading, subject to certain exceptions, requires a permit from the Monterey County Planning and Building Inspection Department. Grading permit decisions may be appealed to the five-member Board of Appeals, which has been appointed by the Board of Supervisors, and subsequently to the Board of Supervisors.
	Digging and Excavation Permit (MCC Chapter 16.10)	• A separate permit from the Monterey County Planning and Building Inspection Department is required for any project activities (e.g., digging, excavation, ground disturbance, and development) within the former Fort Ord military base. Permit decisions may be appealed to the Board of Appeals and subsequently to the Board of Supervisors.
	Erosion Control Permit (MCC Chapter 16.12)	• An Erosion Control Permit from the Director of Building Inspection is required for any project development and construction activities (such as site cleaning, grading, and soil removal or placement) that is causing or is likely to cause accelerated erosion. Permit decisions may be appealed to the Board of Appeals and subsequently to the Board of Supervisors.
Monterey Peninsula Water Management District (MPWMD)	Water System Expansion permit in accordance with Ordinance 96 of the MPWMD Board of Directors	• A permit is required for any project activity that would expand the water delivery system within the MPWMD's jurisdiction.
Monterey Bay Unified Air Pollution Control District	Authority to Construct permit in accordance with Local Rule 3.1	• An authorization to construct permit is required for projects that propose to build, erect, alter, or replace any article, machine, equipment, or other contrivance that may emit air contaminants from a stationary source or may be used to eliminate, reduce, or control air contaminant emissions.

TABLE 3-8 (Continued)
ANTICIPATED PERMITS AND APPROVALS

Agency or Department	Permit or Approval	Discussion
Local Agencies (cont.)		
Monterey Bay Unified Air Pollution Control District (cont.)	Permit to Operate in accordance with Local Rule 3.2	• A permit to operate is required to operate the diesel fuel-powered emergency generators, and any other articles, machines, equipment, or other contrivances that may emit air contaminants from a stationary source.
City of Monterey, City of Seaside, City of Marina, City of Sand City, City of Pacific Grove	Land Use (including local coastal development permit(s), as necessary), Building, Public Health, Public Works, Tree/Vegetation Removal, and Encroachment Permits, and/or similar department approvals to those discussed above in the context of Monterey County, each issued in accordance with the applicable city's municipal code	• See related discussions provided in the context of Monterey County.
Transportation Agency for Monterey County (TAMC)	Encroachment Permit	• An encroachment permit is necessary to install conveyance pipelines along the TAMC right-of-way.

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

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