

CHAPTER 3

Description of the Proposed Project

Sections	Tables
3.1 Introduction	3-1 Facilities Summary for the Proposed Project
3.2 Project Components	3-2 Length of Permanent Slant Wells Seaward of 2020 Mean High Water (MHW) Line
3.3 Construction	3-3 Desalination Chemicals and Annual Usage
3.4 Operations and Maintenance	3-4 Construction Staging Areas
3.5 Permits, Approvals, and Regulatory Requirements	3-5 Construction Assumptions for the Proposed Project
	3-6 Overview of Typical Facility Operations for the Proposed Project
	3-7 MPWSP Desalination Plant Operations – Normal Operations vs. Recovery Post 2-Day Shutdown
	3-8 Anticipated Permits and Approvals
Figures	
3-1 CalAm Monterey District Service Area	3-7 New Transmission Main - City of Marina
3-2 Monterey Peninsula Water Supply Project Overview and Index Map	3-8 New Transmission Main - Light Fighter Drive to General Jim Moore Boulevard
3-3a MPWSP Seawater Intake System	3-9 ASR Facilities and Terminal Reservoir
3-3b Cross-Sectional View of Subsurface Slant Wells	3-10 Highway 68 Interconnection Improvements and Carmel Valley Pump Station
3-4 Proposed Pipelines - Lapis Road and Neponset Road Vicinity	3-11 Castroville Pipeline
3-5a MPWSP Desalination Plant	3-12 Castroville Pipeline - Connection to CCSD Distribution System
3-5b MPWSP Desalination Plant – Site Plan	3-13 Castroville Pipeline Optional Alignment
3-6 New Desalinated Water Pipeline	3-14 Site Plans: ASR-5 Well and ASR-6 Well

3.1 Introduction

This chapter describes the components of the Monterey Peninsula Water Supply Project (MPWSP) proposed by the California-American Water Company (CalAm). The information in this chapter is intended to provide the reader with an understanding of the construction and operational aspects of CalAm’s proposed project¹ and provide a common basis for the analysis of environmental impacts in Chapter 4, Environmental Setting (Affected Environment), Impacts, and Mitigation Measures.

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

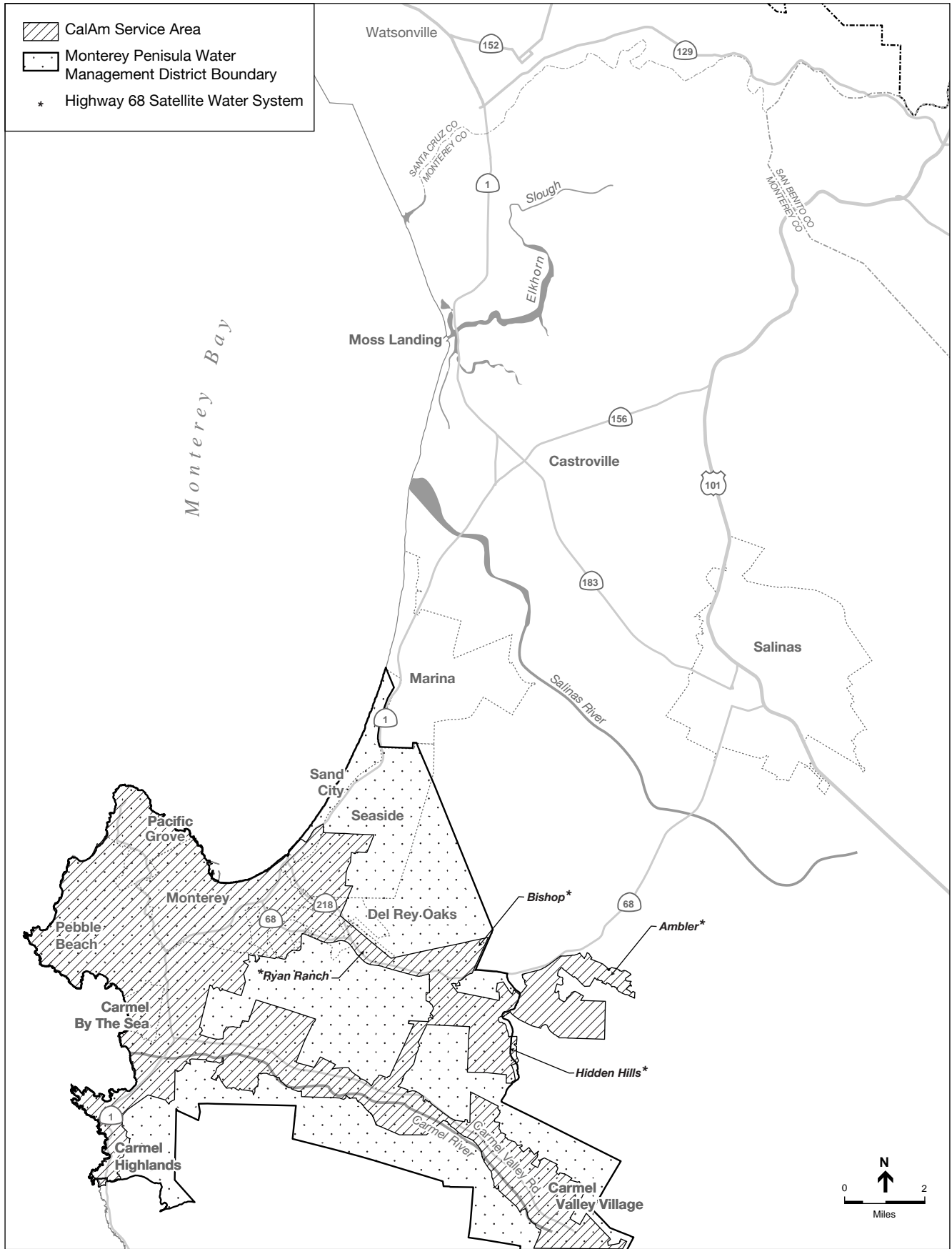
CalAm is proposing the MPWSP to develop a new water supply for CalAm's Monterey District service area (Monterey District) (see **Figure 3-1**). Section 2.2 of Chapter 2, Water Demand, Supplies, and Water Rights describes the legal decisions and Section 2.3 describes the project demand assumptions that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

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

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

To inform the final design of the subsurface slant wells and the MPWSP Desalination Plant treatment system, and to collect geologic and hydrogeologic data needed for Federal, state, regional, and local permits for the full-scale project, CalAm built a test slant well at the same location as the seawater intake system for the proposed Project. CalAm currently is operating the test slant well as a pilot program to collect data. Construction of the test slant well and operation of the pilot program was covered under separate environmental review.² The test slant well is permitted to operate until February 2018 and it is not part of the proposed Project being evaluated in this EIR/EIS. If the MPWSP with subsurface slant wells at CEMEX is not approved and implemented, the test well would be removed. However, if the proposed subsurface slant wells at CEMEX are ultimately approved as part of the proposed Project, CalAm would convert the test slant well into a permanent well 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/EIS as part of the proposed project.

² In October 2014, Monterey Bay National Marine Sanctuary finished its NEPA review of the construction of the test slant well and the operation of the pilot program. In November 2014, the City of Marina and the California Coastal Commission completed their CEQA review.



SOURCE: ESA, 2013

205335.01 Monterey Peninsula Water Supply Project

Figure 3-1

CalAm Monterey District Service Area

This page intentionally left blank



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

205335.01 Monterey Peninsula Water Supply Project

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

SOURCE: ESA, 2016

This page intentionally left blank

3.2 Project Components

The MPWSP comprises the following facilities:

- The seawater intake system, which would consist of 10 subsurface slant wells³ (eight active and two on standby) extending offshore into submerged lands of Monterey Bay National Marine Sanctuary (MBNMS), and a Source Water Pipeline
- A 9.6 mgd desalination plant and related 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
- Desalinated water conveyance facilities including pipelines, a stand-alone pump station, and a Terminal Reservoir
- An expanded ASR system, including two additional injection/extraction wells, the ASR-5 and ASR-6 Wells, and three parallel pipelines, the ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline. These expanded pipelines would convey water to and from the new ASR injection/extraction wells and backwash effluent from the wells to an existing settling basin

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

3.2.1 Seawater Intake System

3.2.1.1 Subsurface Slant Wells

The seawater intake system would include 10 subsurface slant wells at the coast (eight active and two on standby at any given time) 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, about 2 miles south of the Salinas River, in the retired mining area of the CEMEX sand mining facility (see **Figure 3-3a**). The slant wells would be built south of the existing CEMEX access road.

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

**TABLE 3-1
FACILITIES SUMMARY FOR THE PROPOSED PROJECT**

Facility	Description	Purpose
Seawater Intake System		
Subsurface Slant Wells	<ul style="list-style-type: none"> • Ten slant wells (one existing test slant well converted into a permanent well plus nine new wells), with up to eight wells operating at any given time and two wells on standby. • Each slant well would be 900 to 1,000 feet long with a diameter of 22 to 36 inches, and extend beneath the coastal dunes, sandy beach, and the surf zone, terminating 161 to 356 feet seaward of the Mean High Water (MHW) line (i.e., within MBNMS, except #8 which would not extend past the MHW line) and at a depth of 190 to 210 feet below the seafloor. • The wellheads (surface components) for the ten slant wells would be located at six sites along the back (inland) side of the dunes: two sites with three slant wells each and four sites with one slant well each. • Each slant well would be equipped with a 2,500 gpm, 300 hp submersible well pump for a total feedwater supply of 24.1 mgd from 8 active slant wells. • Each well site would have one wellhead vault (Sites 1, 3, 4, and 5) or three wellhead vaults (Sites 2 and 6), aboveground mechanical piping (meter, valves, gauges), one electrical control cabinet, and one pump-to-waste vault. • Except for Site 1 (test slant well site), the aboveground facilities (at Sites 2 through 6) would be built on a concrete pad ranging between 5,250 and 6,025 square feet in area. 	The slant wells would draw seawater from groundwater aquifers that extend beneath the ocean floor (the Dune Sands Aquifer and the 180-Foot-Equivalent Aquifer of the Salinas Valley Groundwater Basin) for use as source water for the MPWSP Desalination Plant.
Source Water Pipeline	<ul style="list-style-type: none"> • 2.2-mile-long, 42-inch-diameter pipeline • A hydraulic surge facility comprising valves or hydro pneumatic tanks would be located near the collector pipe/Source Water Pipeline connection point, south of the CEMEX access road and inland of the dunes. 	<p>This pipeline would convey the source water from the slant wellheads located inland of the dunes, to the MPWSP Desalination Plant.</p> <p>The surge facility would control the hydraulic pressure in the Source Water Pipeline.</p>
Desalination Facilities		
Pretreatment System	<ul style="list-style-type: none"> • Pressure filters or multimedia gravity filters would be partially housed within a 6,000-square-foot pretreatment building. • Two 300,000-gallon backwash supply and filtered water equalization tanks • Two 0.25-acre, 10-foot-deep, lined backwash settling basins with decanting system • Multi-purpose pump station would consist of an outdoor concrete pad, with an area of approximately 8,000 square feet, located central to the process facilities, and include the following equipment: <ul style="list-style-type: none"> – Seven cartridge filters 	<p>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.</p> <p>Cartridge filters would remove fine particulates from the filtered water and protect the RO membranes.</p> <p>Filtered water pumps would direct process water through the cartridge filters to RO system.</p> <p>Backwash supply pumps would be used to clean the media in the pressure filters.</p>

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

Facility	Description	Purpose
Desalination Facilities (cont.)		
Pretreatment System (cont.)	<ul style="list-style-type: none"> - Four filtered water pumps: Two 12-mgd, 350-horsepower (hp) pumps, and two 6-mgd, 200-hp pumps - Two backwash supply pumps (16 mgd, 150 hp each) 	
Reverse Osmosis (RO) System	<ul style="list-style-type: none"> • First-pass seawater RO system comprising seven modules (six active and one standby), with each module producing 1.6 mgd of “permeate,” that is, the purified water produced through the RO membrane. • Partial second-pass brackish water RO system comprising four modules (three duty and one standby), with each module producing 1.3 mgd of permeate. • The RO units and cleaning systems and chemical storage tanks would be housed within a 30,000-square-foot process and electrical building (membrane process building). 	The RO system would remove salts and other minerals from pretreated source water.
Post-treatment System	<ul style="list-style-type: none"> • Ultraviolet disinfection system (if required) comprising three reactors (two active and one standby) that would be housed in the membrane process building. • Carbon dioxide system comprising one 120-ton storage tank and feed equipment in a concrete enclosure that would be located next to membrane process building • Lime system comprising two 20,000-gallon storage tanks and feed equipment in a concrete enclosure that would be located next to membrane process building 	<p>If required by the State Water Resources Control Board (SWRCB) Division of Drinking Water, the UV Disinfection system would provide additional primary disinfection.</p> <p>The carbon dioxide and lime systems would adjust the hardness, pH, and alkalinity of the desalinated product water in accordance with drinking water requirements.</p>
Chemical Storage (Membrane Process Building)	<p>The following treatment chemicals would be housed in the membrane process building. The storage tanks/drums would sit on concrete stalls with secondary containment curbs to contain inadvertent spills of hazardous treatment chemicals:</p> <ul style="list-style-type: none"> • Sodium hypochlorite - two 6,500-gallon storage tanks • Sodium hydroxide - one 5,200-gallon tank • Sulfuric acid -one 10,000-gallon tank • Sodium bisulfite - one 6,000-gallon tank • Zinc orthophosphate -one 5,600-gallon tank • Anti-scalant - one 6,300-gallon tank • Non-ionic polymer – multiple 55-gallon drums 	<p>The sodium hypochlorite system would generate low-concentration chlorine solution using salt and electricity; and the chlorine would provide primary and residual disinfection for drinking water.</p> <p>The sodium hydroxide system would adjust the pH and alkalinity of the desalinated product water and disinfect the water in accordance with drinking water requirements.</p> <p>The sulfuric acid system would be used to clean the RO membranes.</p> <p>The sodium bisulfite system would be used to dechlorinate process waters and brine in the treatment, cleaning and disposal processes.</p> <p>The zinc orthophosphate system would be used as a corrosion inhibitor in the treated water to protect the distribution system.</p>

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

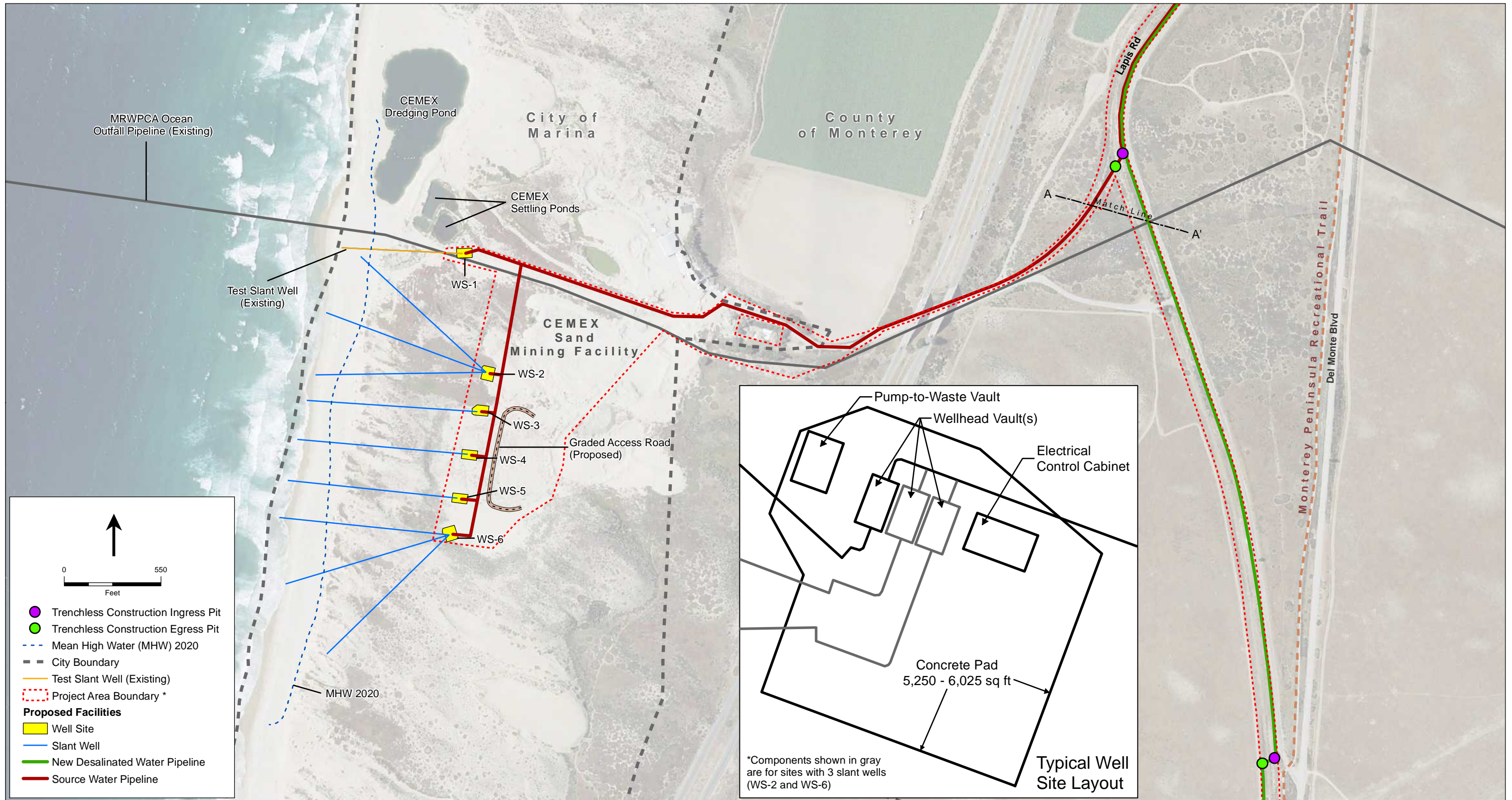
Facility	Description	Purpose
Desalination Facilities (cont.)		
Chemical Storage (Membrane Process Building) (cont.)		<p>The anti-scalant system would be used in the treatment process to reduce fouling and protect the RO membranes.</p> <p>The non-ionic polymer system would be used in the treatment process to improve settling of particulates in the used washwater from the pressure filters before the clarified washwater was returned to the plant for treatment or disposed of with the brine.</p>
Administrative Building	<ul style="list-style-type: none"> 4,000- to 6,000-square-foot building 	<p>This building would house restrooms, locker rooms, break rooms, conference rooms, electrical controls, laboratory facilities, equipment storage and maintenance, and electrical service equipment.</p>
Brine Storage and Disposal Facilities		
Brine Storage and Disposal	<ul style="list-style-type: none"> 3-million-gallon brine storage basin 1-mile-long, 30-inch-diameter Brine Discharge Pipeline Two 6 mgd, 40 hp brine disposal pumps Brine aeration system 	<p>Brine concentrate produced during the RO process would be conveyed to the brine storage basin located at the MPWSP Desalination Plant. The Brine Discharge Pipeline would convey decanted effluent from the pretreatment filtration backwash cycle and RO concentrate produced by the RO system (both located in the membrane process building) and brine stored in the brine storage basin to the headworks of the existing MRWPCA outfall. The brine aeration system would maintain dissolved oxygen concentrations in the brine at acceptable levels.</p>
MRWPCA Ocean Outfall Pipeline and Diffuser (existing)	<ul style="list-style-type: none"> Existing 2.3 mile-long, 60-inch diameter pipe (onshore portion) Existing 2.1-mile-long, 60-inch-diameter pipe (offshore portion) Existing 1,100-foot-long diffuser with 172 ports, each 2 inches in diameter and spaced 8 feet apart 	<p>Brine and pretreatment backwash effluent from the desalination plant would be conveyed from the headworks, to the existing ocean outfall pipeline. The existing outfall terminates at a diffuser located offshore in MBNMS that would discharge the brine concentrate or brine blended with treated wastewater effluent to Monterey Bay.</p>
Desalinated Water Conveyance and Storage Facilities		
Treated Water Storage Tanks	<ul style="list-style-type: none"> Two approximately 103-foot-diameter, 1.75-million gallon above ground treated water storage tanks (with a total combined storage volume of 3.5 mg). 	<p>The treated water storage tanks would serve as holding tanks from which water would be pumped to either the CalAm water system, the existing CSIP pond or the Castroville Pipeline.</p>
Desalinated Water Pumps	<ul style="list-style-type: none"> Desalinated water pumps and equipment would be located at a multi-purpose pump station and would include the following equipment: <ul style="list-style-type: none"> Four 4.8 mgd, 600 hp treated water pumps Two 2.4 mgd, 300 hp treated water pumps Two 1.4 mgd, 10 hp Salinas Valley return flow pumps 	<p>The treated water pumps would pump desalinated water from the MPWSP Desalination Plant through distribution pipelines to the customers in the Monterey District service area.</p> <p>The Salinas Valley pumps would direct desalinated water (i.e., Salinas Valley return flows) from the MPWSP Desalination Plant to the Castroville Community Services District (CCSD) and/or CSIP system.</p>

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

Facility	Description	Purpose
Desalinated Water Conveyance and Storage Facilities (cont.)		
New Desalinated Water Pipeline	<ul style="list-style-type: none"> • 3.3-mile-long, 36-inch-diameter pipeline 	This pipeline would convey desalinated water from the treated water storage tanks at the MPWSP Desalination Plant to the new Transmission Main at Reservation Road.
New Transmission Main	<ul style="list-style-type: none"> • 6-mile-long, 36-inch-diameter pipeline 	This pipeline would convey desalinated water between the new Desalinated Water Pipeline at Reservation Road, crossing U.S. Army-owned property along General Jim Moore Blvd. to the existing Phase I ASR Facilities.
Terminal Reservoir	<ul style="list-style-type: none"> • Two 3-million-gallon storage tanks 	These tanks would store desalinated water and ASR product water.
Carmel Valley Pump Station	<ul style="list-style-type: none"> • 3 mgd, 100 hp pump station 	This 500-square-foot facility would provide the additional water pressure needed to pump water through the existing Segunda Pipeline into Segunda Reservoir.
Interconnection Improvements for Highway 68 Satellite Systems a) Ryan Ranch–Bishop Interconnection b) Main System–Hidden Hills Interconnection	<ul style="list-style-type: none"> • 1.1-mile-long, 8-inch-diameter pipeline • 1,200-foot-long, 6-inch-diameter pipeline • Two new 350 gpm pumps 	These interconnection pipelines and associated improvements would allow CalAm to convey MPWSP water supplies to the Ryan Ranch, Bishop, and Hidden Hills satellite water systems.
Castroville Pipeline	<ul style="list-style-type: none"> • 4.5-mile-long, 12 inch-diameter pipeline extending from MPWSP Desalination Plant to Castroville (see Figures 3-11 and 3-12) 	This pipeline would convey desalinated water from the MPWSP Desalination Plant to the Castroville Seawater Intrusion Project (CSIP) distribution system and the CCSD Well #3. Desalinated water would be delivered to the CSIP system via a new connection point located approximately halfway along the pipeline alignment at Nashua Road and Monte Road. At the northern pipeline terminus, desalinated water would be delivered to the CCSD Well #3 at Del Monte Avenue and Merritt Street.
Pipeline to CSIP Pond	<ul style="list-style-type: none"> • 1.2-mile-long, 12-inch-diameter pipeline (see Figure 3-5) 	This pipeline would convey desalinated water from the MPWSP Desalination Plant to the CSIP pond for subsequent delivery to agricultural users in the Salinas Valley.

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

Facility	Description	Purpose
ASR System		
Two new ASR Injection/Extraction Wells, referred to as ASR-5 and ASR-6 Wells	<ul style="list-style-type: none"> Two proposed 1,000-foot-deep injection/extraction wells (ASR-5 and ASR-6 Wells) with a combined injection capacity of 2.2 mgd and extraction capacity of 4.3 mgd 	The proposed new ASR injection/extraction wells would be used to inject Carmel River supplies and desalinated water into the Seaside Groundwater Basin for storage. The two proposed ASR wells would be located on U.S. Army-owned property in the Fitch Park neighborhood of the Ord Military Community. The four existing ASR wells would also be used for these purposes. During periods of peak demand, the stored water would be extracted and delivered to customers.
ASR System (cont.)		
ASR Pipelines: 1. ASR Recirculation Pipeline 2. ASR Conveyance Pipeline 3. ASR Pump-to-Waste Pipeline	<ul style="list-style-type: none"> Three parallel 0.9-mile-long, 16-inch-diameter pipelines 	<p>ASR Recirculation Pipeline would be used to convey water from existing conveyance pipelines and infrastructure at Coe Avenue and General Jim Moore Boulevard to the new ASR-5 and ASR-6 Wells for injection.</p> <p>ASR Conveyance Pipeline would be used to convey extracted ASR water supplies to the existing infrastructure at Coe Avenue/General Jim Moore Boulevard.</p> <p>ASR Pump-to-Waste Pipeline would convey backflush effluent produced during routine maintenance of the ASR-5 and ASR-6 Wells to the existing Phase I ASR settling basin.</p> <p>Portions of the ASR Recirculation, ASR Conveyance, and ASR Pump-to-Waste pipelines would be located on U.S. Army-owned property between the proposed ASR wells and the southern end of U.S. Army property located north of the Coe Avenue/General Jim Moore Boulevard intersection.</p>



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

SOURCE: ESA, 2016

This page intentionally left blank

Test Slant Well and Long-Term Aquifer Pump Test

As described in Section 3.1, CalAm has built a test slant well in the CEMEX active mining area and currently is operating the test slant well as a pilot program to collect data. The environmental effects associated with construction and operation of the test slant well were evaluated in accordance with CEQA and NEPA requirements by the City of Marina/California Coastal Commission (CCC) and MBNMS in November 2014, respectively. The test well is permitted through February 2018 and therefore, construction of the test slant well and operation of the pilot program are not evaluated in this EIR/EIS. The site-specific field data collected during the pilot program are intended to inform the final design of the subsurface slant wells, the overall seawater intake system, and the MPWSP Desalination Plant treatment system. The test slant well facilities include the test well, a submersible well pump, a wellhead vault, electrical facilities and controls, temporary flow measurement and sampling equipment, monitoring wells, and a temporary pipeline connection to the adjacent MRWPCA ocean outfall pipeline for discharges of the test water. The test slant well was drilled at 19 degrees below horizontal, is 724 feet long, and is screened⁴ for 450 linear 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 aquifer pump testing, CalAm proposes to convert the test slant well into a permanent well and operate it as part of the MPWSP seawater intake system. Both the construction of the additional conveyance and treatment facilities needed to convert the test slant well into a permanent well and the long-term operation and maintenance of the converted test slant well are part of the proposed project, and thus evaluated in this EIR/EIS. Sections 3.2.1.2 through 3.2.2.6, below, describe the conveyance and treatment facilities for the source water produced at the subsurface slant wells during long-term operations.

Permanent Slant Wells

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

The nine new permanent slant wells would be approximately 900 to 1,000 feet long and drilled at approximately 14 degrees below horizontal to extend offshore to a distance of 161 to 356 feet seaward of the MHW line (except #8, which would not extend past the MHW line) and to a depth of 190 to 210 feet beneath the seafloor. This means that although all construction activities and ground disturbance would occur above mean sea level and landward of the MHW line, the well casings would extend subsurface and seaward of the MHW line and below the seafloor within MBNMS. Each well would be screened for approximately 400 to 800 linear feet at depths corresponding to both the Dune Sand Aquifer and the underlying 180-Foot-Equivalent Aquifer of

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

the Salinas Valley Groundwater Basin. CalAm would operate eight wells at a time at approximately 2,100 gallons per minute (gpm) per well and maintain the other two wells on standby.

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

**TABLE 3-2
LENGTH OF PERMANENT SLANT WELLS SEAWARD OF
2020 MEAN HIGH WATER (MHW) LINE (feet)**

	MHW	MHW + env	MHW storm	MHW storm + env
Test Well	171	248	305	384
SW-1	64	161	235	335
SW-2	213	291	347	425
SW-3	140	226	289	373
SW-4	144	222	278	356
SW-5	190	268	325	403
SW-6	245	323	379	457
SW-7	234	315	373	460
SW-8	-	-	5	173
SW-9	278	356	411	489

NOTES:

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

"+ env" stands for envelope of change that accounts for the alongshore variability in shore profile.

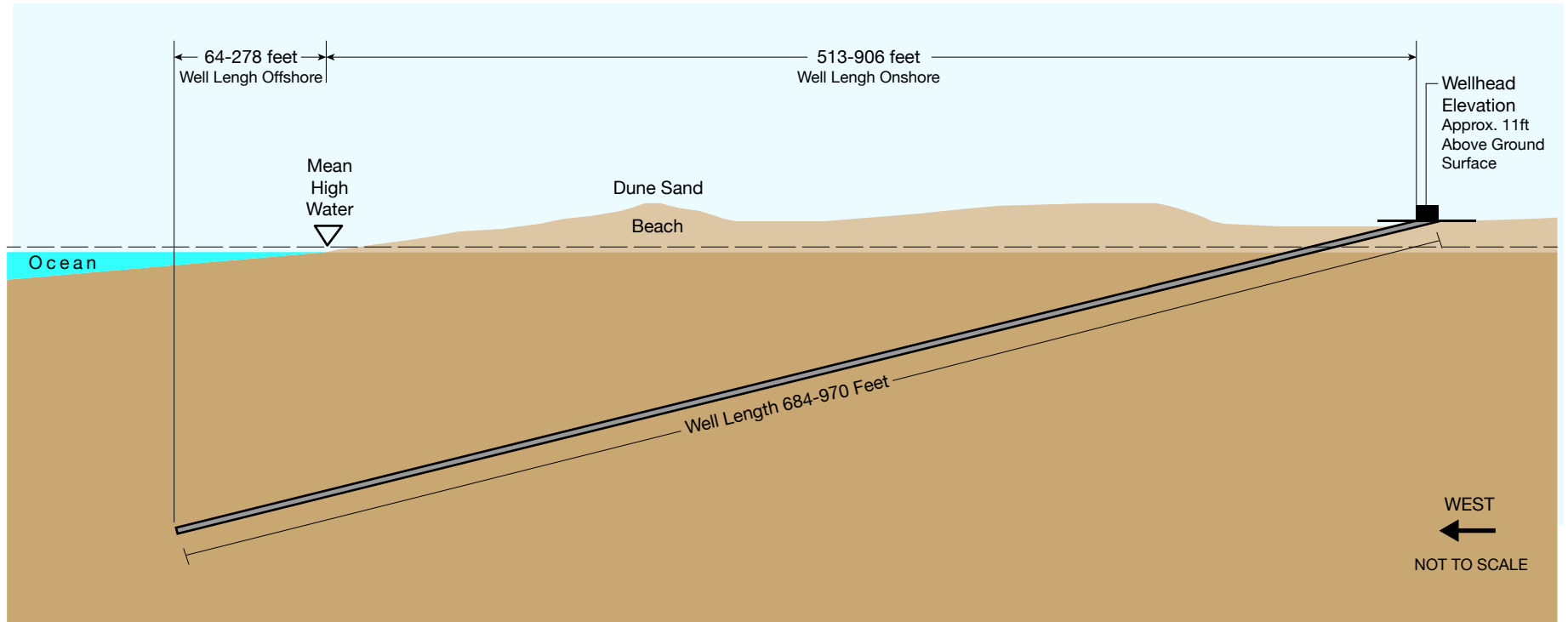
"storm" considers the potential erosion from a large (100-year) coastal storm.

Missing lengths mean the well screen does not extend beyond the MHW line.

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

SOURCE: ESA, 2016

The 10 slant wells would be located at six sites along the back of the dunes: four sites (the test slant well site and three new sites) would each have one slant well, and two sites would have three slant wells (see Figure 3-3a). The well sites are numbered sequentially, with Site 1 being the northernmost site and Site 6 the southernmost site. The test slant well would be converted into a permanent well at Site 1. The nine new permanent wells would be drilled over a total distance of about 900 feet at Sites 2 through 6. The wellheads of the three new permanent wells at Site 2 would be located about 300 feet south of Site 1. Sites 3, 4, and 5 would be spaced approximately 250 feet apart and would have one slant well each. Site 6 would have three wells.



WELL NUMBER	DEPTH OF WELL CASING (BELOW WELL HEAD)	WELL LENGTH (PLAN)	WELL LENGTH ONSHORE (PLAN)	WELL LENGTH OFFSHORE (PLAN)
1	242'	970'	906'	64'
2	242'	970'	757'	213'
3	242'	970'	830'	140'
4	242'	970'	826'	144'
5	242'	970'	780'	190'
6	242'	970'	725'	245'
7	242'	970'	736'	234'
8	242'	970'	NA	NA
9 (Stand-by-2)	242'	970'	692'	278'
Test Slant Well	263'	684'	513'	171'

SOURCE: ESA, 2015

205335.01 Monterey Peninsula Water Supply Project

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

Sites 1 through 6 would include the following aboveground facilities: one wellhead vault per slant well, mechanical piping (meters, valves, gauges), an electrical control cabinet, and a pump-to-waste vault. Each wellhead would be enclosed in an aboveground 12-foot-long, 6-foot-wide, and 8-inch-tall precast concrete vault. Each slant well would be equipped with a 2,500 gpm, 300 hp submersible well pump. The electrical controls for operation of the slant wells would be housed in a single-story, 16-foot-long by 7-foot-wide fiberglass electrical control cabinet located at each of the six well sites. Each site would also have a pump-to-waste vault for the percolation of turbid water produced during slant well startup and shutdown. The pump-to-waste vault would be a precast 12-foot-long, 8-foot-wide, and 1-foot-tall concrete vault covered with a metal grate and underlain by clean gravel and permeable geotextile fabric. The new permanent slant wells and associated aboveground infrastructure at Sites 2 through 6 would be constructed on a 5,250- to 6,025-square-foot concrete pad located above the maximum high tide elevation on the inland side of the dunes (no concrete pad would be built at Site 1). A 750-foot-long, 42-inch-diameter buried NSF/ANSI 61⁵-certified pipe would collect the seawater pumped from Sites 2 to 6 and convey it to the proposed buried Source Water Pipeline located at the existing CEMEX access road.

3.2.1.2 Source Water Pipeline

The approximately 2.2-mile-long, 42-inch-diameter buried NSF/ANSI 61-certified 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 would run parallel to the MRWPCA's existing outfall pipeline for approximately 0.7 mile (see **Figure 3-3a**). Approximately 500 feet east of Highway 1, the Source Water Pipeline would veer northeast along a dirt path for roughly 1,000 feet to Lapis Road. There, a jack and bore method would be used to install the pipeline under the existing railroad tracks. The alignment would continue north along Lapis Road for about 0.5 mile. Just south of where Lapis Road meets Del Monte Boulevard, the pipeline would turn east across Del Monte Boulevard and continue east for 0.8 mile to the MPWSP Desalination Plant site at the east end of Charles Benson Road. This 0.8-mile-long segment of pipe would be installed parallel to, and north of, the Charles Benson Road right-of-way (i.e., outside of the paved road). The land that borders Charles Benson Road to the north is separated from Charles Benson Road by a row of mature Monterey cypress and eucalyptus trees and a portion of this land is currently under agricultural production. The pipeline would be installed east-to-west along the north side of the row of trees and along the southern boundary of the agricultural land (see **Figures 3-4 and 3-5a**). CalAm is negotiating an easement with the landowners for installation of the Source Water Pipeline, as well as the new Desalinated Water Pipeline and the Castroville Pipeline, outside of the paved roadway.

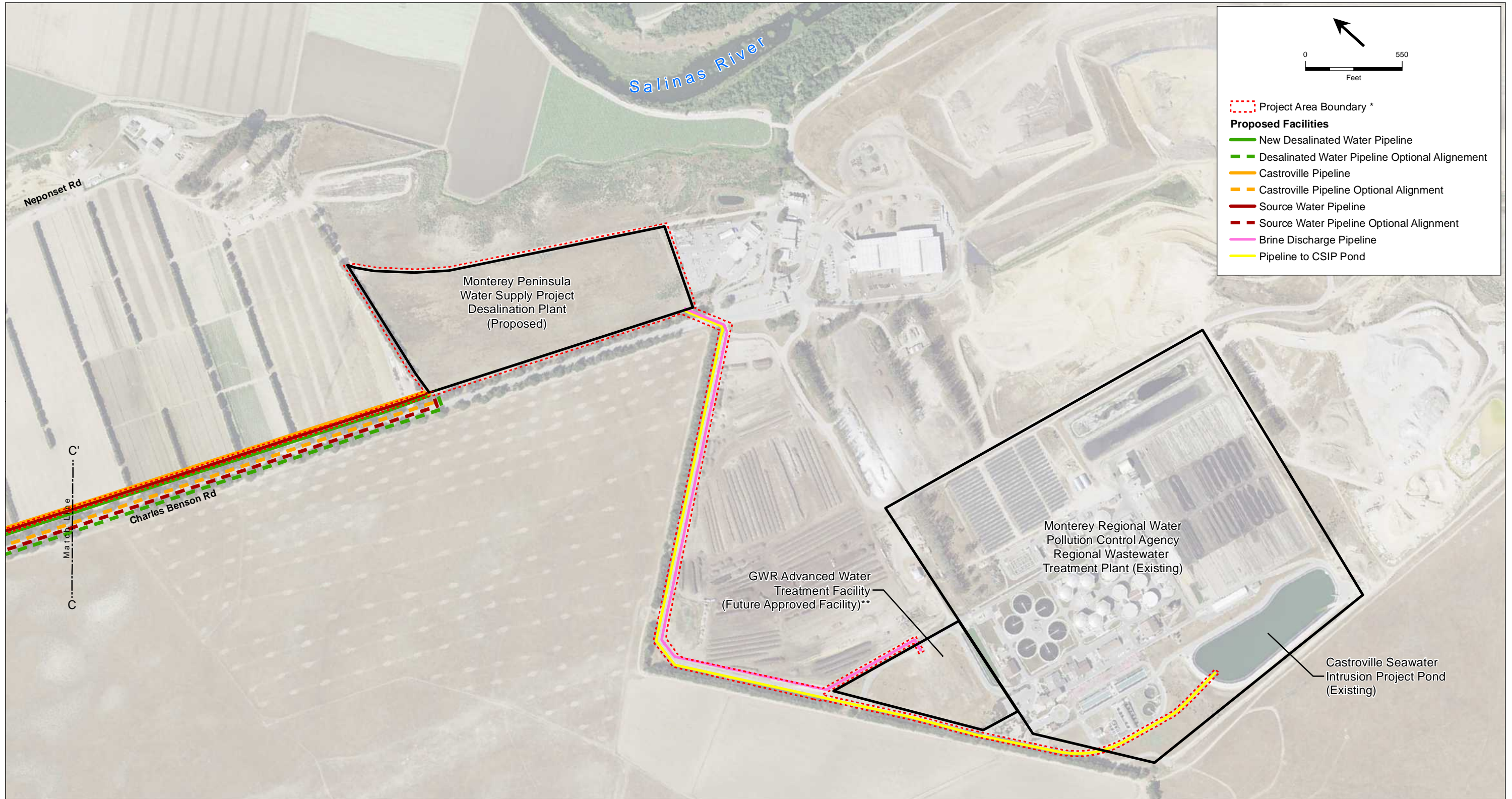
⁵ National Sanitation Foundation/American National Standards Institute. NSF/ANSI Standard 61 (NSF-61) is a set of national standards that relates to water treatment and establishes stringent requirements for the control of equipment that comes in contact with either potable water or products that support the production of potable water.



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

SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project
Figure 3-4
 Proposed Pipelines - Lapis Road and Neponset Road Vicinity



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

SOURCE: ESA, 2016

Source Water Pipeline – Optional Alignment

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

3.2.2 MPWSP Desalination Plant

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

The MPWSP Desalination Plant would have a rated production capacity of 9.6 mgd and a maximum production capacity⁶ of 11.2 mgd.

3.2.2.1 Pretreatment System

Source water from the subsurface intake wells would be conveyed directly to the pretreatment system. The purpose of the pretreatment system would be to improve the quality of source water being treated by the RO system, described in Section 3.2.2.2, below, in order to increase the efficiency of RO treatment. The pretreatment requirements for seawater collected by the proposed slant wells will be determined through the operation of the test slant well and pilot program, but could include coagulation, flocculation,⁷ or membrane filtration. The pretreatment system would likely 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.

⁶ Maximum production capacity (11.2 mgd) is the full physical capacity of the MPWSP Desalination Plant with all seven RO modules in service. As described in Section 3.4.1, after shutdown periods, CalAm may need to operate the desalination plant at maximum production capacity of 11.2 mgd to catch up on production; however, the total annual production would not exceed an average of 9.6 mgd (Svindland, 2014).

⁷ Flocculation is a process used to separate suspended solids from water. Flocculation involves the addition of an agent to water to promote the aggregation of suspended solids into particles large enough to settle or be removed.

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 would be added to the source water to separate out iron and manganese, and the precipitate would be removed by the filters. In addition, the pretreatment system could play an important role in pathogen removal. Because a portion of the source water supply would be groundwater under the influence of surface water as defined under the U.S. Environmental Protection Agency (USEPA) Surface Water Treatment Rule,⁸ the source water would be subject to the Surface Water Treatment Rule and the Long-Term 2 Enhanced Surface Water Treatment Rule.

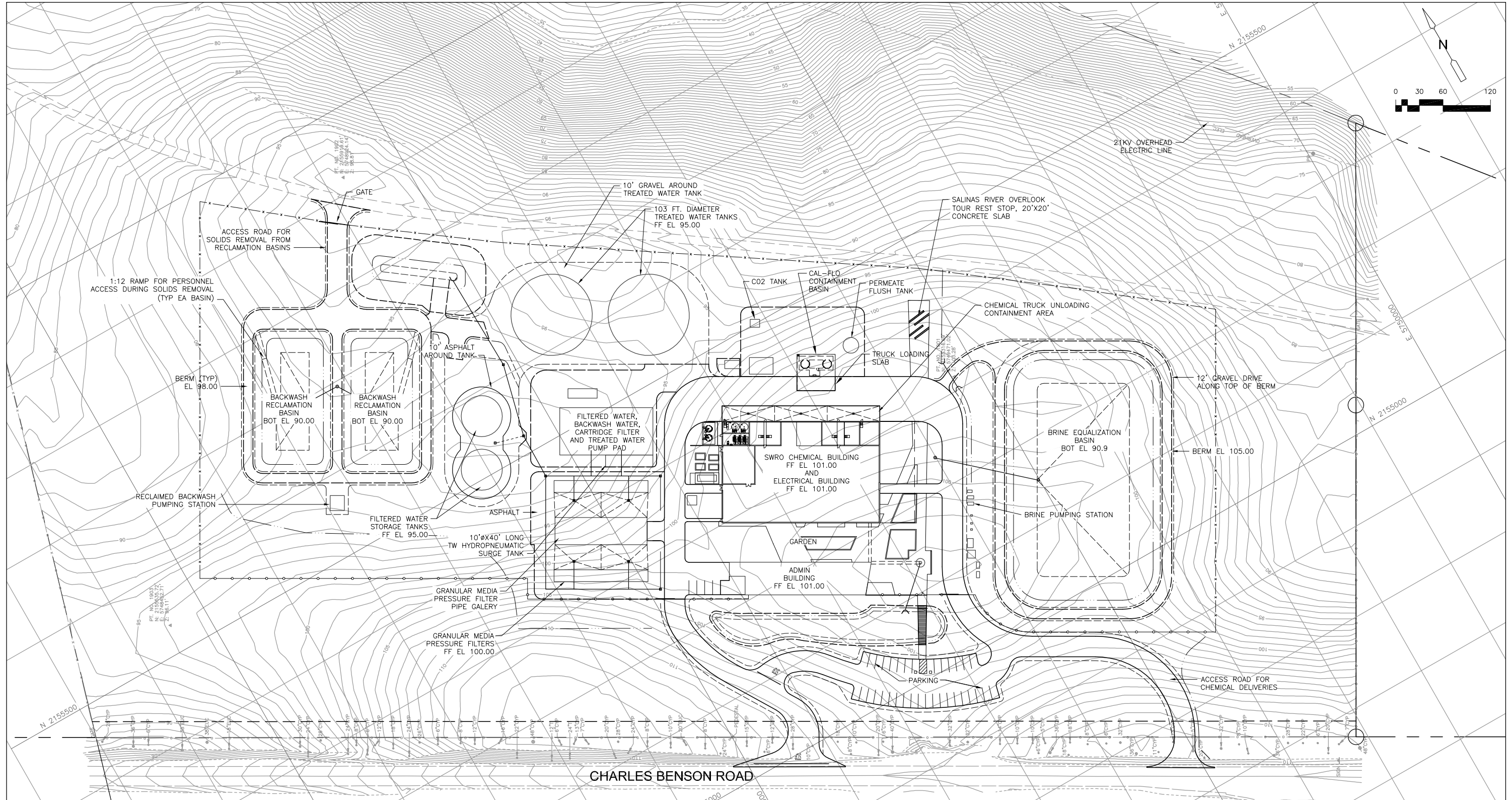
The pretreatment process would produce approximately 23.6 mgd of pretreated, filtered source water. The pretreated source water would be conveyed to two 300,000-gallon backwash supply and filtered water equalization tanks. The majority of the pretreated source water would then be pumped directly to the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

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

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

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

⁸ The USEPA Surface Water Treatment Rule (40 CFR 141.70-141.75) seeks to prevent waterborne diseases caused by viruses, *Legionella*, and *Giardia lamblia*. The rule requires that water systems filter and disinfect water from surface water sources to reduce the occurrence of unsafe levels of these microbes.



SOURCE: CDM Smith, 2014

205335.01 Monterey Peninsula Water Supply Project

Figure 3-5b
MPWSP Desalination Plant—Site Plan

This page intentionally left blank

3.2.2.2 Reverse Osmosis System

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

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

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

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

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

The accumulation of salts or scaling (from to microbial contamination, turbidity, and other contaminants such as iron and manganese) on the RO membranes causes fouling, which reduces membrane performance. The pretreatment system described above would reduce fouling of the RO membranes, increasing the efficiency of the RO system and extending the useful life of the RO membranes. However, the RO system still would require cleaning two to three times per year. The RO cleaning system would be housed in the same building as the RO system and would include chemical storage, chemical feedlines, and a collection tank. System operators would clean the RO membranes by circulating a cleaning solution, made of strong bases or acids, through the

membranes and then flushing the membranes with clean water to remove the spent cleaning solution and waste effluent from the RO system. The spent cleaning solution and waste effluent would be discharged into a collection tank, chemically neutralized, and discharged to the sanitary sewer system at the eastern portion of the MPWSP Desalination Plant site.

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

3.2.2.3 Post-treatment System

After leaving the RO system, the desalinated water would pass through a post-treatment system to make the water more compatible with the other water supply sources in the CalAm system and provide adequate disinfection prior to distribution to customers. Facility operators would use metering pumps and chemical feedlines to dose the post-treatment chemicals through the proper injection points along the post-treatment system. Post-treatment facilities would include chemical feedlines and injection systems for lime and carbon dioxide. Carbon dioxide would be added to adjust alkalinity; lime would be added to adjust calcium hardness; sodium hydroxide would be used to adjust pH; and sodium hypochlorite would be added for disinfection. In addition, an ultraviolet disinfection system may be required to comply with pathogen removal/inactivation standards established by the Surface Water Treatment Rule and Long Term 2 Enhanced Surface Water Treatment Rule. If required, the ultraviolet disinfection system would comprise three reactors, two active and one standby, housed in the membrane process building. The final design of post-treatment facilities would be based on the water quality data collected during operation of the test slant well and pilot program and the results of a geochemical mixing study.⁹ Any adjustments made to the post-treatment system during final design of the MPWSP Desalination Plant within the 25-acre development area would not affect any of the analyses or conclusions in this EIR/EIS. All treatment chemicals would be transported, stored and used in accordance with regulatory requirements.

3.2.2.4 Chemical Use and Storage

As noted in previous sections, facility operators would use various chemicals to treat the water as it passes through the pretreatment, RO, and post-treatment processes to ensure the water meets drinking water quality requirements and is compatible with native groundwater in the Seaside

⁹ 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.

Groundwater Basin.¹⁰ The chemicals used during the desalination process would be stored onsite in accordance with applicable regulatory requirements. Chemical storage facilities would include secondary concrete containment, alarm notification systems, and fire sprinklers. **Table 3-3** summarizes the chemicals that would be used during the desalination process and the projected annual usage amounts. The pre-treatment and post-treatment chemicals would be housed in various 5,000- to 10,000-gallon bulk storage tanks located inside or next to the membrane process building. RO cleaning chemicals would be stored in smaller containers. Sumps and sump pumps within the chemical containment area and loading areas would collect and contain any chemicals accidentally released during operations.

**TABLE 3-3
DESALINATION CHEMICALS AND ANNUAL USAGE**

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

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

3.2.2.5 Brine Storage and Disposal

The RO process would generate approximately 14 mgd of brine, including 0.4 mgd of decanted backwash water as noted in Section 3.2.2.1, Pretreatment System. The brine storage and disposal system would consist of an uncovered 3-million-gallon brine storage basin with two impermeable liners; two 6 mgd, 40 hp brine discharge pumps; and a brine aeration system to maintain dissolved oxygen concentrations in the brine at 5 mg/L. Brine from the RO system would be conveyed through the 1-mile-long, 30-inch-diameter Brine Discharge Pipeline to a new connection with the existing MRWPCA ocean outfall that discharges into the waters of MBNMS. When temporary storage is needed, brine would be directed to the brine storage basin where it could be stored for up to 5 hours, then pumped to the Brine Discharge Pipeline.

During some times of the year, brine would be mixed with varying volumes of treated wastewater from the MRWPCA Regional Wastewater Treatment Plant before being discharged through the ocean outfall. During the irrigation season, April through October, the treated wastewater is diverted to the Salinas Valley Reclamation Project's tertiary treatment facility for additional

¹⁰ As discussed in Section 3.4.2, below, during periods of low demand, desalinated product water could be injected into the Seaside Groundwater Basin for storage. The post-treatment system would be designed to ensure that desalinated product water that is injected into underground storage would not adversely affect groundwater quality.

advanced treatment and then used to irrigate crops as part of the Castroville Seawater Intrusion Project (CSIP). During this time period, as long as MRWPCA treated wastewater flows are equal to or less than the CSIP demand for irrigation water, the project's brine stream would be discharged to Monterey Bay without dilution. During the non-irrigation season, November through March, when the CSIP is not operating, the brine stream would at all times be mixed with treated wastewater from the MRWPCA Regional Wastewater Treatment Plant before being discharged to the ocean. A range of possible mixtures of brine and treated wastewater is described in Section 4.3, Surface Water Hydrology and Water Quality.

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

3.2.2.6 Administrative Building

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

3.2.3 Desalinated Water Conveyance

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

3.2.3.1 Treated Water Storage Tanks

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

3.2.3.2 Desalinated Water Pumps

The proposed desalinated water pumps would be located at the multi-purpose pump station described in Section 3.2.2.1, near the center of the MPWSP Desalination Plant. Separate systems would pump desalinated product water to the CalAm water system and to the Salinas Valley. Consistent with the capacity of the MPWSP Desalination Plant, a 9.6 mgd capacity pump system would pump desalinated product water to the CalAm water system. There would be four 4.8 mgd,

600 hp treated water pumps and two 2.4 mgd, 300 hp treated water pumps. Unless the final results of the aquifer pump tests at the existing test slant well dictate otherwise, two 1.4 mgd, 10 hp Salinas Valley return flow pumps would pump desalinated product water (i.e., Salinas Valley return flows) to the Castroville Community Services District (CCSD) and CSIP water distribution systems as described in Sections 3.2.3.7 and 3.2.3.8.

3.2.3.3 New Desalinated Water Pipeline

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

New Desalinated Water Pipeline – Optional Alignment

Similar to the optional alignment for the Source Water Pipeline (see Section 3.2.1.2), the optional alignment for the new Desalinated Water Pipeline would be identical to the alignment described in the paragraph above, except that the 0.8-mile-long segment along Charles Benson Road would be installed within the Charles Benson Road paved right-of-way (as opposed to north of and outside of the right-of-way, along private agricultural lands) (see **Figure 3-4**).

3.2.3.4 New Transmission Main

At Reservation Road, water in the new Desalinated Water Pipeline would enter the 6-mile-long, 36-inch-diameter new Transmission Main and continue south along the west side of the Monterey Peninsula Recreational Trail and TAMC right-of-way. At a point approximately 750 feet north of Highway 1, it would cross east under the Monterey Peninsula Recreational Trail and TAMC right-of-way using trenchless construction and continue south on the west side of Del Monte Boulevard and beneath the Highway 1 overpass where it would follow between the Monterey Peninsula Recreational Trail and TAMC right-of-way for approximately 2 miles. At approximately 1,000 feet north of the Lightfighter Drive overpass, the new Transmission Main would cross under Highway 1 and continue southeast for approximately 1,400 feet, making two turns before reaching the south side of Lightfighter Drive, just east of the intersection of Lightfighter Drive and 1st Avenue. The

Highway 1 crossing would require an entry pit at the Monterey Peninsula Recreational Trail and TAMC right-of-way, and an egress pit on the opposite side of Highway 1, between the highway and 1st Avenue. Each of these pits would be approximately 150 feet long by 50 feet wide. The new Transmission Main would continue east along Lightfighter Drive for approximately 0.4 mile to General Jim Moore Boulevard, turn south along the east side of General Jim Moore Boulevard to Normandy Road. South of Normandy Road the pipeline would be located along the west side of General Jim Moore Boulevard, ending at the existing Phase I ASR Facilities near General Jim Moore/Coe Avenue (see **Figures 3-7** through **3-9a**).

New Transmission Main – Optional Alignment

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

3.2.3.5 Terminal Reservoir

The proposed Terminal Reservoir would comprise two water storage tanks located in an undeveloped portion of the former Fort Ord military base, approximately 1,200 feet (0.2 mile) east of General Jim Moore Boulevard, on the north side of Watkins Gate Road (see **Figure 3-9b**). The Terminal Reservoir tanks would 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. This EIR/EIS evaluates two options for the storage tanks: an aboveground option and a buried option. Under either option, each tank would hold 3 million gallons, for a total storage capacity of 6 million gallons, and the 1,200-foot-long section of Watson Gate Road extending from General Jim Moore Boulevard to the Terminal Reservoir site, which is now a dirt access road, would be paved.

Terminal Reservoir – Aboveground Tanks Option

Each aboveground tank would be 33 feet tall and 130 feet in diameter. The two aboveground tanks would be constructed on an approximately 0.75-acre concrete pad. Security fencing would enclose a 3.5-acre area around the aboveground tanks.

Terminal Reservoir – Buried Tanks Option

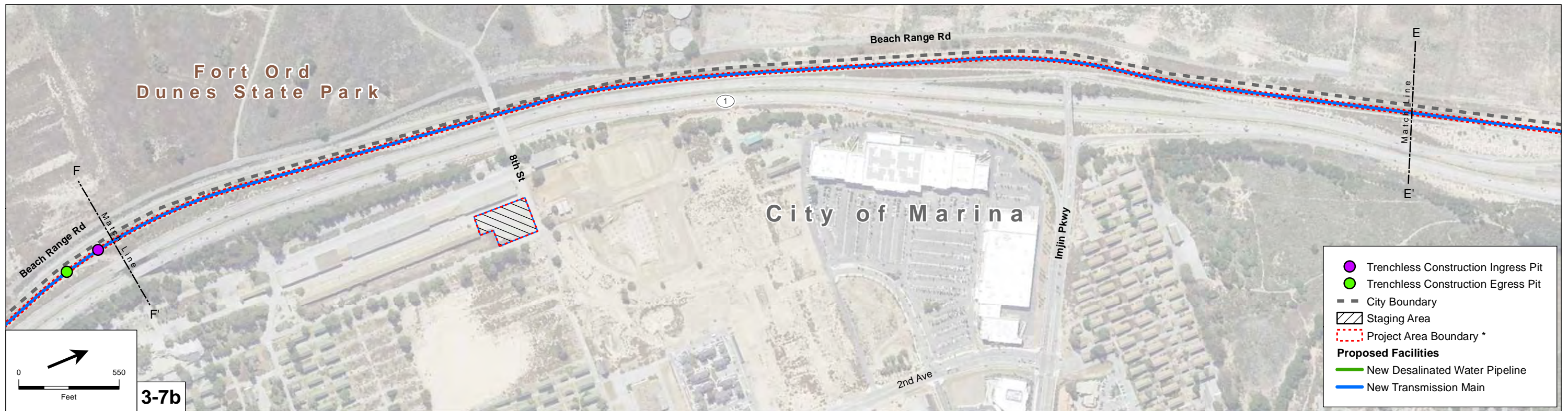
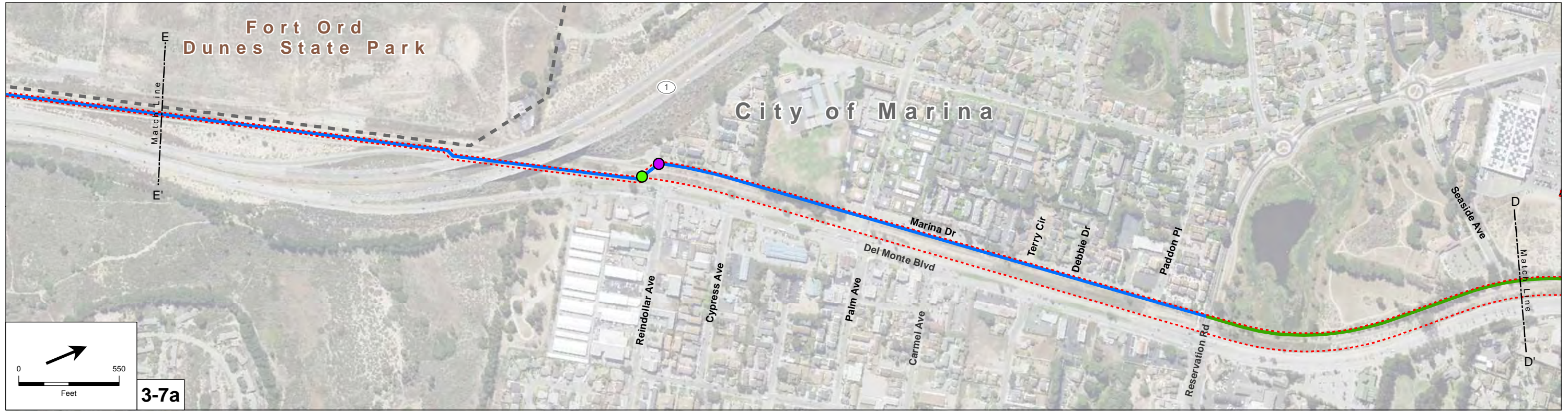
Under this option the tanks would be fully buried and the ground surface above the tanks would be graded to an elevation of approximately 345 feet, similar to the existing topography. The area above the tanks would be partially landscaped. The buried tanks option would not include a concrete pad or security fencing.



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

SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project
Figure 3-6
 New Desalinated Water Pipeline



- Trenchless Construction Ingress Pit
- Trenchless Construction Egress Pit
- City Boundary
- Staging Area
- Project Area Boundary *
- Proposed Facilities**
- New Desalinated Water Pipeline
- New Transmission Main

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

SOURCE: ESA, 2016

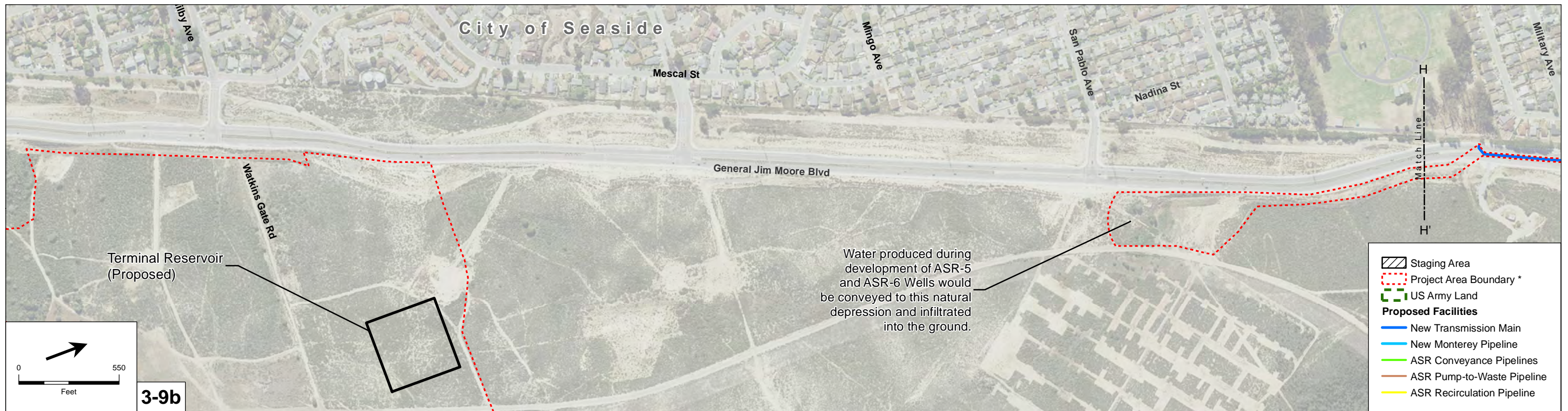
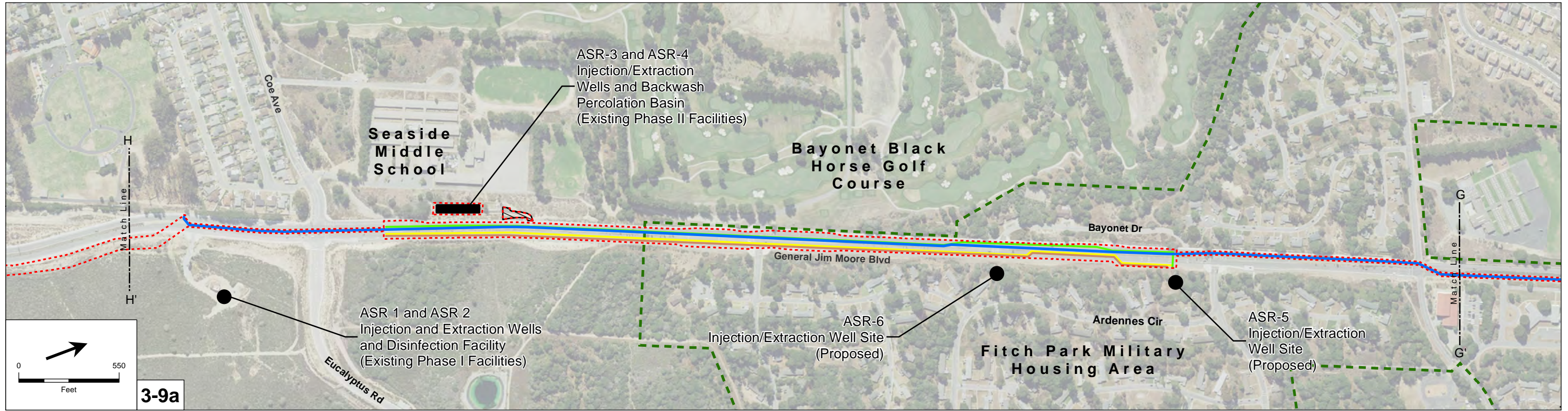
205335.01 Monterey Peninsula Water Supply Project
Figure 3-7
New Transmission Main - City of Marina



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

SOURCE: ESA, 2016; US ARMY, 2016

205335.01 Monterey Peninsula Water Supply Project
Figure 3-8
New Transmission Main - Light Fighter Drive
to General Jim Moore Boulevard



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

SOURCE: ESA, 2016; US ARMY, 2016

205335.01 Monterey Peninsula Water Supply Project
Figure 3-9
 ASR Facilities and Terminal Reservoir

3.2.3.6 Carmel Valley Pump Station

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

3.2.3.7 Castroville Pipeline

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

From the MPWSP Desalination Plant, the Castroville Pipeline would head west along the north side (outside of the paved roadway, through agricultural land) of Charles Benson Road to Del Monte Boulevard, at which point the pipeline would head north. The pipeline would be installed along Del Monte Boulevard to Lapis Road and then along the west side of Lapis Road within the TAMC right-of-way. It would be installed beneath the Salinas River at the Highway 1 bridge via trenchless construction methods. On the north side of the Salinas River bridge, the pipeline would continue northeast along the TAMC right-of-way and Monte Road to Nashua Road. A new pipe connection to the CSIP distribution system would be built at the northern end of Monte Road, where it meets Nashua Road. The Castroville Pipeline would continue north along a dirt agricultural road and the Union Pacific Railroad, crossing under Tembladero Slough to Highway 183 (Salinas Road). From Highway 183, the pipeline would continue north between Del Monte Avenue and Union Pacific Railroad, turn west across Del Monte Avenue and connect to CCSD Well #3 at the north corner of Del Monte Avenue and Merritt Street (see **Figures 3-4, 3-5, 3-11, and 3-12**).

Castroville Pipeline – Optional Alignment 1

Optional Alignment 1 would provide an alternate pipeline route from the intersection of Monte Road and Nashua Road to CCSD Well #3. From the intersection of Monte Road and Nashua Road, Optional Alignment 1 would turn northwest along Nashua Road to the Monterey Peninsula Recreational Trail. It would continue northeast along the Monterey Peninsula Recreational Trail

on the east side of Highway 1 for approximately 1.5 mile to Merrit Way and continue southeast on Merritt Street for 0.5 mile to CCSD Well #3 (see **Figures 3-11b, 3-12, and 3-13**).

Castroville Pipeline – Optional Alignment 2

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

3.2.3.8 Pipeline to CSIP Pond

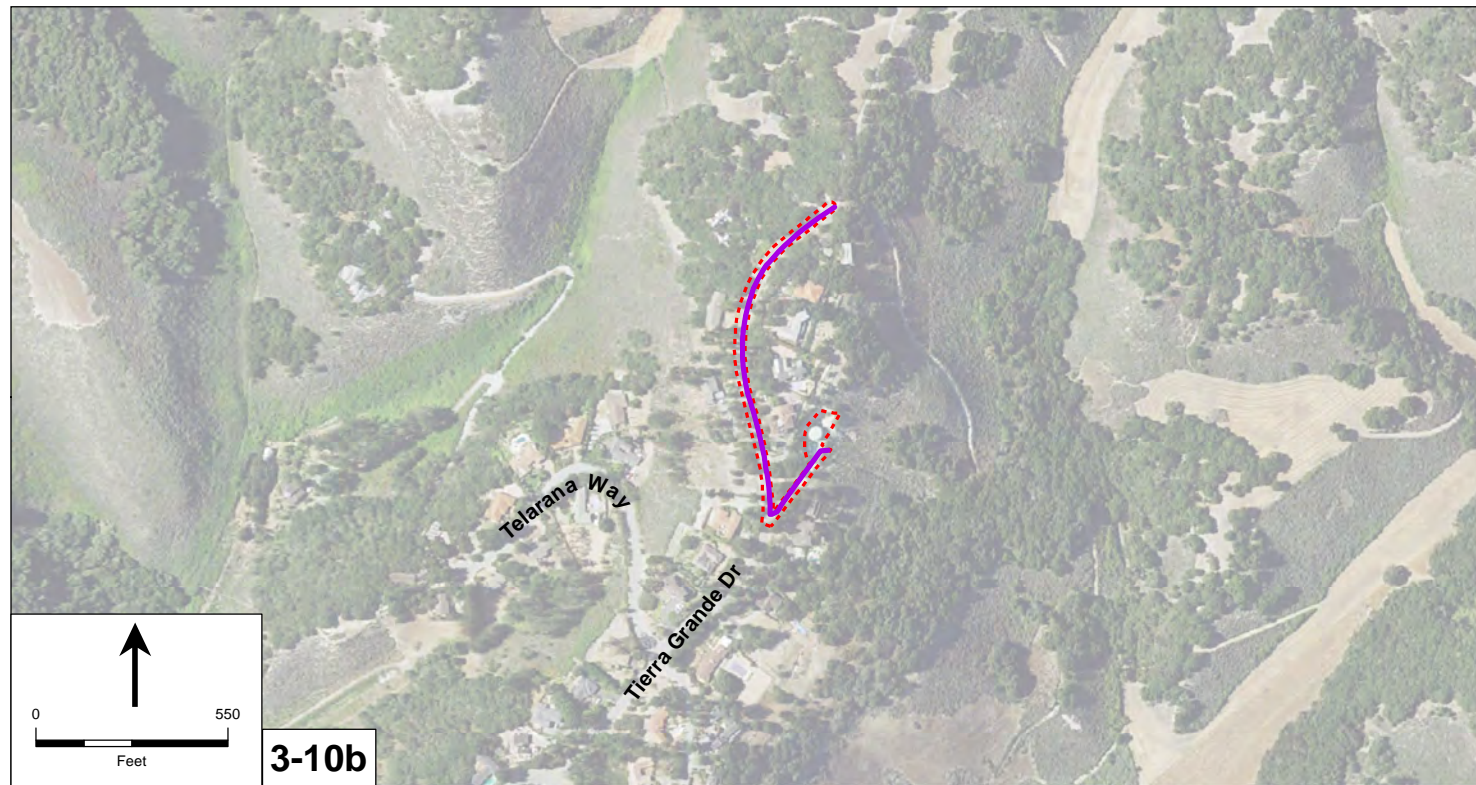
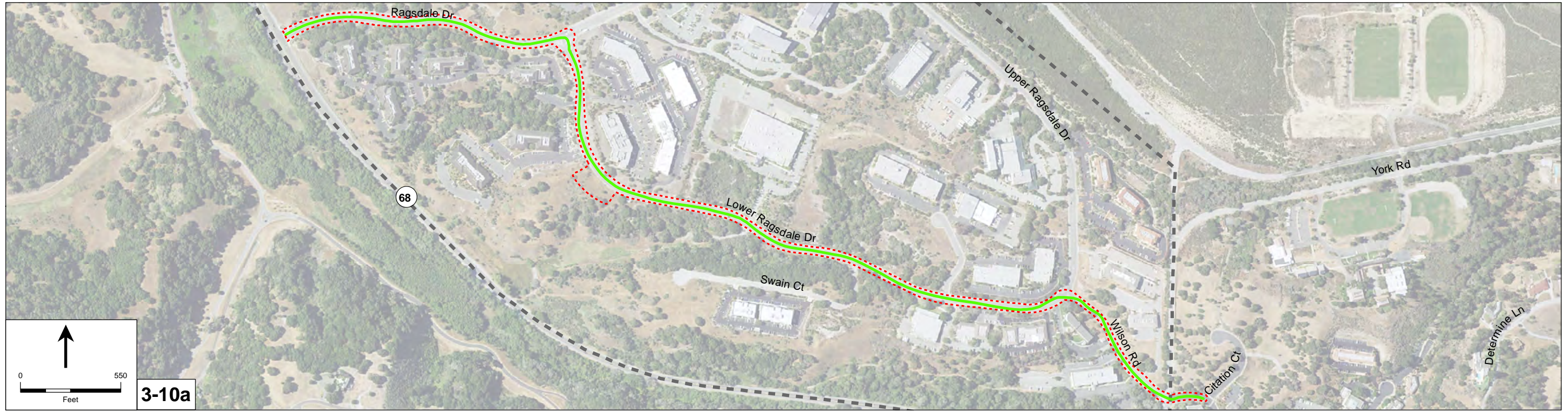
As described in Chapter 2, Water Demand, Supplies and Water Rights, and Section 3.2.3.7 above, the portion of the water drawn from the subsurface slant wells that is determined to be groundwater originating from the Salinas Valley Groundwater Basin, would be delivered to agricultural users in the Salinas Valley Groundwater Basin in lieu of an equal amount of groundwater pumping. The portion of the Salinas Valley return water destined for the CSIP would be delivered via a new connection along the Castroville Pipeline at Nashua Road and Monte Road, this EIR/EIS also evaluates a Pipeline to the CSIP Pond if engineering constraints preclude the new Castroville Pipeline connection. Note that only the return flows to the CSIP pond may have constraints; no issues are anticipated for the connection to the CCSD distribution system. For purposes of CEQA/NEPA environmental review, this analysis conservatively assumes that CalAm would build both the Castroville Pipeline and the Pipeline to CSIP Pond. If CalAm does so, it would pump some of the Salinas Valley return water from the MPWSP Desalination Plant through a new 1.2-mile-long, 12-inch-diameter pipeline to the existing CSIP pond at the southern end of the MRWPCA Regional Wastewater Treatment Plant. The CSIP pond holds 80 af. From the CSIP pond, water would be delivered to agricultural users in the Salinas Valley through existing infrastructure (see **Figures 3-4 and 3-5**).

3.2.3.9 Interconnections with Highway 68 Satellite Systems

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

Ryan Ranch–Bishop Interconnection Improvements

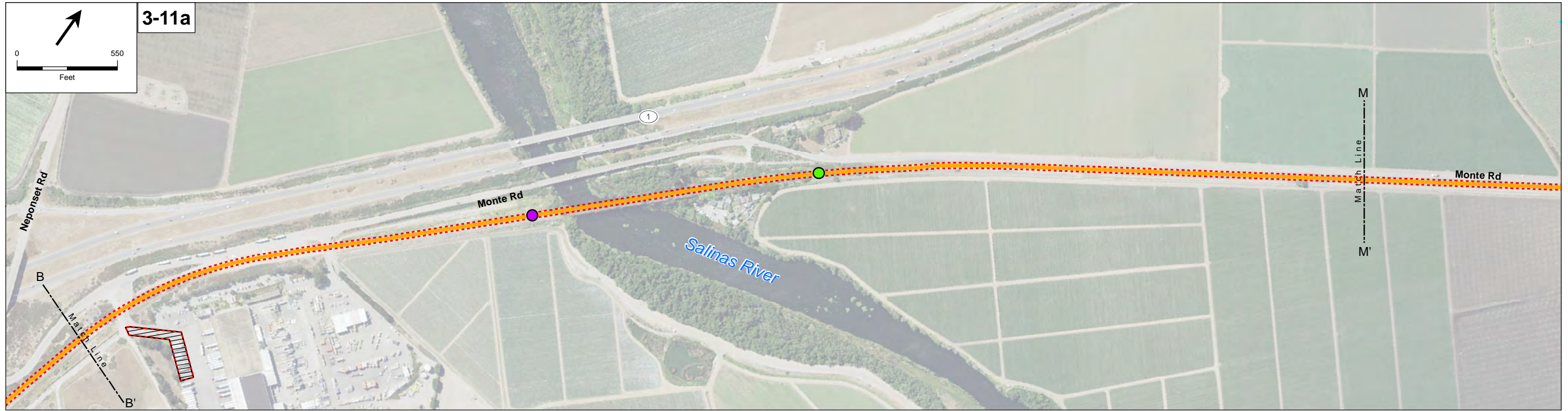
Project improvements to the interconnection between the main system and the Ryan Ranch and Bishop systems would involve building a 1.1-mile-long, 8-inch-diameter pipeline from an existing interconnection at Highway 68 and Ragsdale Drive, through the Ryan Ranch community, to a new connection with the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



- City Boundary
- - - Project Area Boundary *
- Proposed Facilities**
- Main System-Hidden Hills Interconnection Improvements
- Ryan Ranch-Bishop Interconnection Improvements
- Carmel Valley Pump Station Inlet and Outlet Pipelines

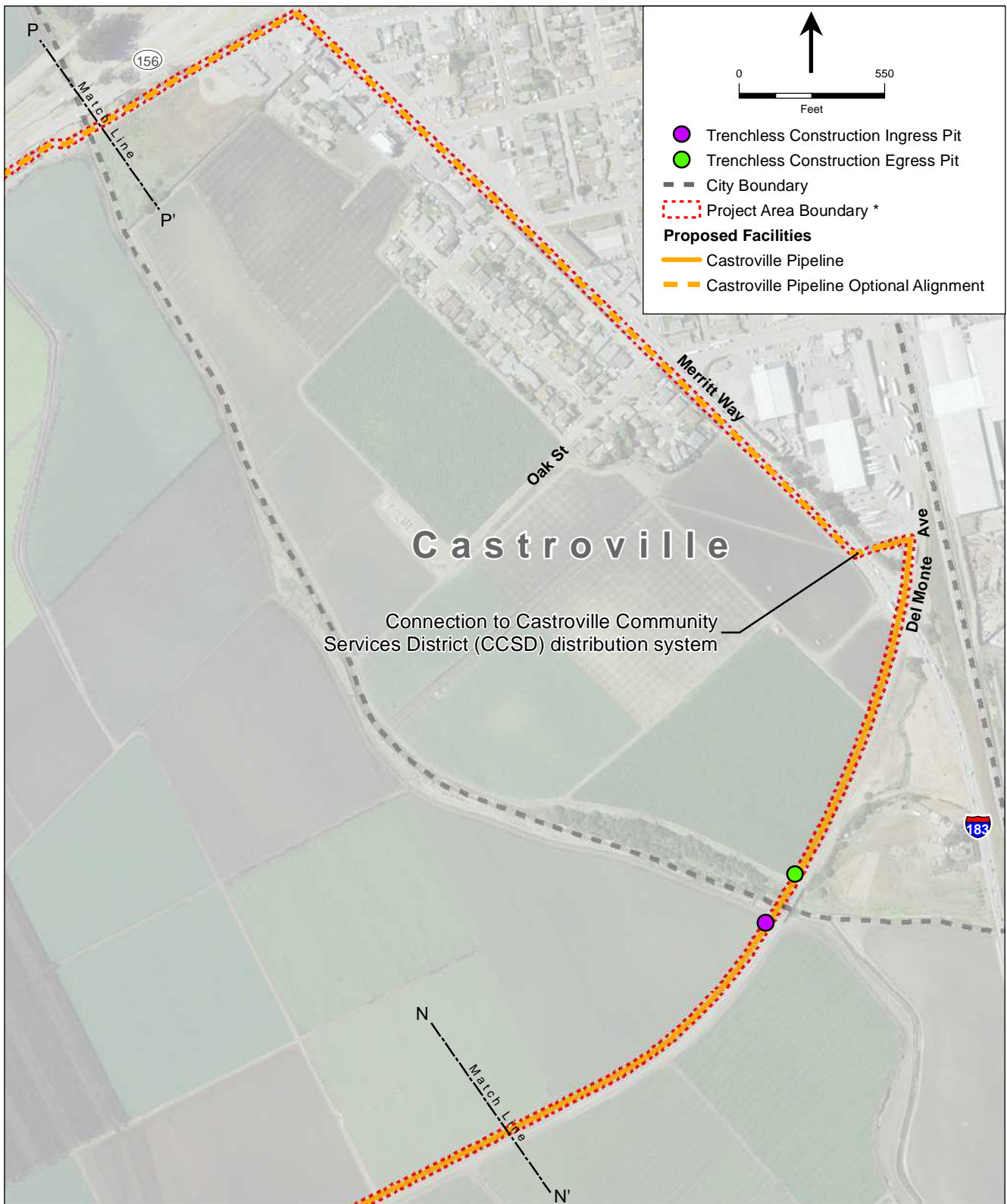
NOTE:
*Project area boundary refers to the area within which all construction related disturbance would occur.

SOURCE: ESA, 2016



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

SOURCE: ESA, 2016



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

SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 3-12
 Castroville Pipeline - Connection to CCSD Distttribution System

This page intentionally left blank



SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project
Figure 3-13
 Castroville Pipeline Optional Alignment

This page intentionally left blank

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).

3.2.4 Proposed ASR Facilities

As part of the MPWSP, CalAm proposes to expand the existing Seaside Groundwater Basin ASR system to provide additional injection/extraction capacity for both desalinated product water and Carmel River supplies, and to increase system reliability. The proposed improvements to the ASR system include adding two injection/extraction wells, ASR-5 and ASR-6 Wells, and adding three parallel 0.9-mile-long ASR pipelines. The proposed ASR-5 and ASR-6 Wells would be located along General Jim Moore Boulevard on U.S. Army owned property, currently under lease to Monterey Bay Military Housing (MBMH), north of the Phase I and Phase II ASR facilities in Seaside (see **Figure 3-9**). These improvements would not affect CalAm's maximum allowable surface water diversions from the Carmel River for injection into the groundwater basin.

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

CalAm would build two additional injection/extraction wells (ASR-5 and ASR-6 Wells) on two, U.S. Army-owned parcels located east of General Jim Moore Boulevard and south of its intersection with Ardennes Circle, in the Fitch Park MBMH area (see Figure 3-9a). The new injection/extraction wells would be drilled to a depth of approximately 1,000 feet and screened in the Santa Margarita sandstone aquifer. Each well would have a permanent 500 hp multi-stage vertical turbine pump, Supervisory Control and Data Acquisition (commonly called SCADA)¹¹ 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 would be installed at each well site to power the electrical control system. Pacific Gas & Electric Company (PG&E), the local electrical utility, would own and operate the electrical transformers. Security fencing would encompass an approximately 0.4- and 0.5-acre area around the ASR-5 and ASR-6 Wells, respectively (RBF Consulting, 2010).

The existing ASR disinfection system is housed within the chemical/electrical control building at the site of the existing ASR-1 and ASR-2 Wells.¹² The existing disinfection system has sufficient capacity to treat ASR product water extracted from all six ASR injection/extraction wells (i.e., the four Phase I and Phase II wells and the two new wells proposed under the MPWSP). The

¹¹ SCADA (Supervisory Control And Data Acquisition) is a system for remote monitoring and operations of water supply facilities.

¹² The existing ASR-1 and ASR-2 Wells are also known as Santa Margarita Wells #1 and #2 in other information sources.

disinfection system consists of a 5,000-gallon bulk sodium hypochlorite storage tank, chemical metering pumps, and chlorine residual analyzer. The disinfection system includes double containment for all chemical storage and dispensing equipment, protective vent-fume neutralizers, safety showers for operations personnel, and a forced-air ventilation system.

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

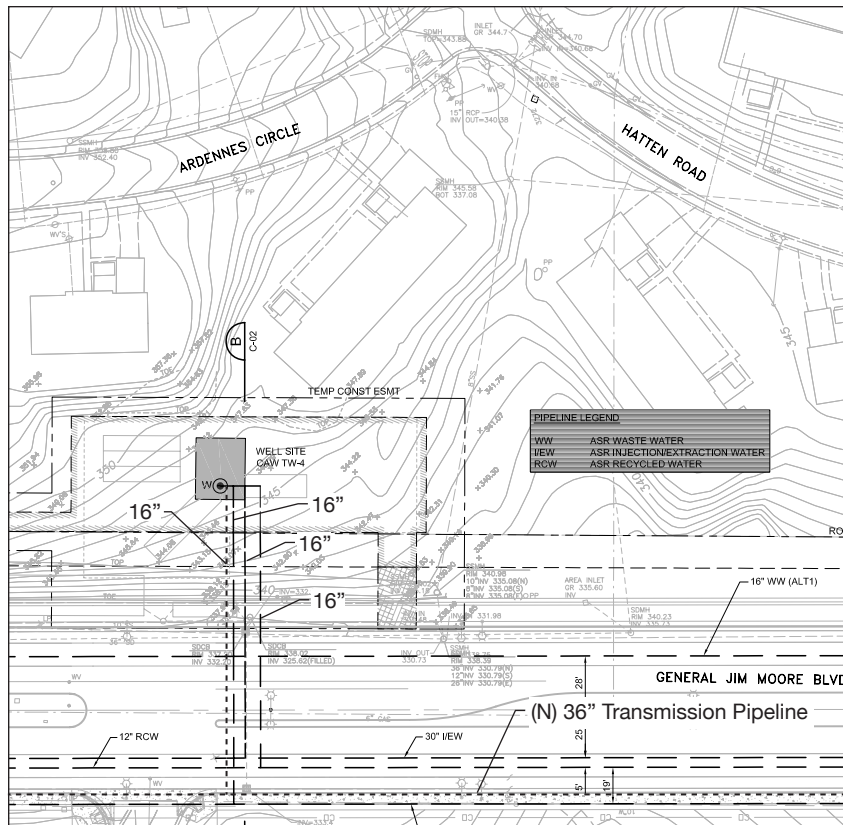
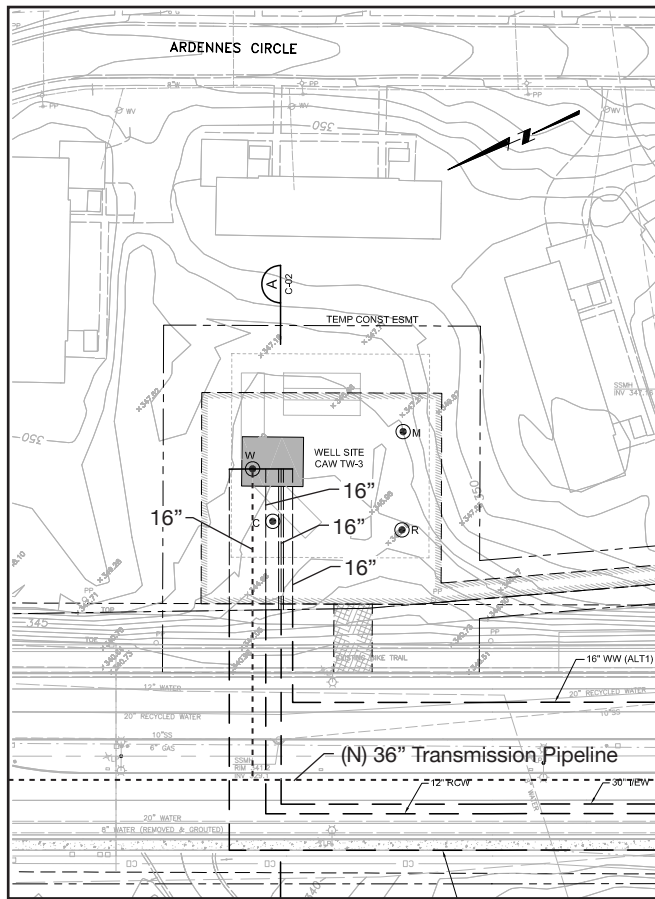
Maintenance of the ASR-5 and ASR-6 Wells would involve routine backflushing of the two wells. Backwash effluent containing elevated levels of sediment and turbidity would be conveyed through the proposed ASR Pump-to-Waste Pipeline (see description below) to the existing settling basin for the Phase I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

3.2.4.2 ASR Pipelines

Three parallel 0.9-mile-long, 16-inch-diameter ASR pipelines -- the ASR Recirculation Pipeline, the ASR Conveyance Pipeline, and the ASR Pump-to-Waste Pipeline -- would extend along General Jim Moore Boulevard between the proposed ASR-5 and ASR-6 Wells at the Fitch Park MBMH area and the intersection of Coe Avenue and General Jim Moore Boulevard. The ASR Recirculation Pipeline would convey water between existing conveyance pipelines and infrastructure at Coe Avenue and General Jim Moore Boulevard to the ASR-5 and ASR-6 Wells for injection. The ASR Conveyance Pipeline would convey water that is extracted from the ASR-5 and ASR-6 Wells to the same facilities at the intersection of Coe Ave and General Jim Moore Boulevard. The ASR Pump-to-Waste Pipeline would convey backflush effluent from the ASR-5 and ASR-6 Wells to the existing settling basin for the ASR-1 and ASR-2 Wells, which is about 2 miles south of the intersection of General Jim Moore Boulevard and Coe Avenue (see Figure 3-9a). Each of the three, 16-inch diameter ASR pipelines would connect to each of the two new ASR wells; the 36-inch diameter Transmission Main would also connect to each of the two new ASR wells with 16-inch diameter connector pipes (see **Figure 3-14**).

3.2.5 Electrical Power Facilities

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



SOURCE: Parsons

205335.01 Monterey Peninsula Water Supply Project
Figure 3-14
 Site Plans: ASR-5 Well and ASR-6 Well

3.3 Construction

3.3.1 Site Preparation and Construction Staging

3.3.1.1 Site Clearing and Preparation

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

3.3.1.2 Staging Areas

Construction equipment and materials would be stored within the construction work areas to the extent feasible. Construction staging for the subsurface slant wells at CEMEX, the MPWSP Desalination Plant, and the ASR-5 and ASR-6 Wells would be accommodated entirely within the project area boundary shown in **Figures 3-3, 3-5, and 3.9a**). For construction of all other facilities and pipelines, construction workers would use eight strategically located staging areas in the project area vicinity. The proposed staging areas are sited with the intent of avoiding sensitive riparian areas or critical habitat for protected species. With the exception of the staging area at Seaside Middle School, the designated staging areas are primarily paved, gravel, or dirt parking lots located in highly disturbed areas. **Table 3-4** summarizes the staging area locations and current site conditions. The staging areas are shown as hatched polygons in **Figures 3-3 through 3-12**.

**TABLE 3-4
CONSTRUCTION STAGING AREAS**

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

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

3.3.2 Well Drilling and Development and Related Site Improvements

3.3.2.1 Subsurface Slant Wells

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

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

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

Drilling fluids, such as water, bentonite mud, or environmentally inert biodegradable additives, would be used to drill through the first 100 feet or so of the dry dune sands to prevent the sand from locking up the drill bit inside the conductor casing. The bentonite mud used in this initial portion of the borehole would be recirculated into and out of the boring using a mud tank located next to the drill rig. Drill cuttings would be removed from the drilling mud using a shaker table and then the drilling mud would be re-used. Once the drill bit reaches groundwater, the construction contractor would pump out all of the sand-bentonite mud slurry and put it in a

storage container for off-site hauling and disposal. The elevation of the groundwater surface will be determined from the existing monitoring wells (MW-1S and MW-3S).

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

The slant wells would be completed using telescoping casing ranging from 22 to 36 inches in diameter and super-duplex 12- to 20-inch diameter stainless steel well screens. A submersible pump would be lowered several hundred feet into each well. To develop the slant wells, each well would be pumped for 2 to 6 weeks during slant well completion and initial well testing. The groundwater pumped from the wells during well development would be discharged to the ocean within the waters of MBNMS via the test slant well discharge pipe and the existing MRWPCA ocean outfall. This well development process would produce a volume of water too great to percolate into the ground at the CEMEX mining area, as compared to the drilling phase described above. Once built, the wellheads would include 12-inch-diameter discharge piping (i.e., flow meter, isolation valve, check valve, pump control valve, air valve, and pressure gauge). This discharge piping would be approximately 2 to 3 feet above the ground on an estimated 6,000-square-foot concrete pad, with some of the mechanical and electrical gear covered by a pre-manufactured shelter to protect them from the elements. The discharge piping would then transition underground via trenching and connect to the buried source water pipeline. The wellheads would be accessible at grade level once completed.

3.3.2.2 ASR Injection/Extraction Wells

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

Water produced during development of the ASR-5 and ASR-6 Wells at the Fitch Park MBMH housing area would be conveyed to a 1.4-acre natural depression located east of the intersection

of San Pablo Avenue and General Jim Moore Boulevard via the pump to waste pipeline and percolated into the ground. The well development water would be disposed of in accordance with Central Coast Regional Water Quality Control Board (RWQCB) Resolution No. R3-2008-0010, General Waiver for Specific Types of Discharges (RWQCB, 2008). Any waste material generated during construction of the proposed ASR facilities that requires off-site disposal would be transported to an approved landfill facility.

3.3.3 Desalination Plant Construction

Construction workers would access the MPWSP Desalination Plant site via Charles Benson Road and existing access roads. Construction activities would include cutting, laying, and welding pipelines and pipe connections; pouring concrete footings for foundations, tanks, and other support equipment; building walls and roofs; assembling and installing major desalination process components; installing piping, pumps, storage tanks, and electrical equipment; testing and commissioning facilities; and finish work such as paving, landscaping, and fencing the perimeter of the site. Construction equipment would include excavators, backhoes, graders, pavers, rollers, bulldozers, concrete trucks, flatbed trucks, boom trucks, cranes, forklifts, welding equipment, dump trucks, air compressors, and generators. Pretreatment, RO, and post-treatment facilities would be prefabricated and delivered to the site for installation. Approximately 25 acres of the 46-acre site would be disturbed during construction (see **Figure 3-5**). Construction activities at the desalination plant site are expected to occur over 24 months. Refer to Sections 3.3.5 and 3.3.6, below, for a description of construction activities associated with pump stations and storage tanks.

3.3.4 Pipeline Installation

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

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

**TABLE 3-5
CONSTRUCTION ASSUMPTIONS FOR THE PROPOSED PROJECT**

Project Component(s)	Total Excess Spoils and Construction Debris (cubic yards)	Construction Equipment	Construction Durations and Work Hours
Subsurface Slant Wells (drilling and development of nine permanent wells, conversion of test slant well to permanent well, and construction of supporting infrastructure in the CEMEX active mining area)	100 cy	<ul style="list-style-type: none"> • 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 construction duration but would take approximately 15 months total. Slant well construction would require 24-hour construction activities.
MPWSP Desalination Plant	0 cy	<ul style="list-style-type: none"> • Excavators • Backhoes • Air compressors • Loaders • Boom trucks • Cranes • Pavers and rollers • Bulldozers • Concrete transport trucks • Concrete pump trucks • Flatbed trucks • Generators • Pickup trucks • Trucks for materials delivery 	The MPWSP Desalination Plant would be constructed over a 24-month period, and would require 24-hour construction activities.
Pipelines: a) Source Water Pipeline b) New Desalinated Water Pipeline and new Transmission Main c) Castroville Pipeline d) Pipeline to CSIP Pond e) Brine Discharge Pipeline f) ASR Pipelines	a) 1,735 cy b) 15,400 cy c) 600 cy d) 785 cy e) 1,075 cy f) 4,540 cy [LB1] Total for all pipelines = 24,135 cy	<ul style="list-style-type: none"> • Flatbed trucks • Backhoes • Excavators • Pipe cutting and welding equipment • Haul trucks for spoils transport • Trucks for materials delivery • Compaction equipment • Baker tank(s) • Pickup trucks • Arc welding machine • Generators • Air compressors • 80-ton crane • Skip loader • Pavers and rollers 	Multiple pipelines, sometimes in the same roadway, would be built simultaneously. To the extent feasible, pipeline installation and associated construction activities would occur during the day. This EIR/EIS assumes that the installation of the Transmission Main and three ASR pipelines within the General Jim Moore Boulevard road right-of-way would occur during the day. At other locations, pipeline installation may require nighttime construction to meet the project schedule. Pipeline installation would occur at a rate of approximately 150 to 250 feet per day. The expected construction duration for each pipeline is as follows: a) Source Water Pipeline – 6 months b) New Desalinated Water Pipeline and new Transmission Main – 15 months c) Castroville Pipeline – 4 months d) Pipeline to CSIP Pond – 2 months e) Brine Discharge Pipeline – 3 months f) ASR Pipelines – 5 months

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

Project Component(s)	Total Excess Spoils and Construction Debris (cubic yards)	Construction Equipment	Construction Durations and Work Hours
ASR Injection/Extraction Wells (ASR-5 and ASR-6 Wells)	280 cy	<ul style="list-style-type: none"> • Drill rig • Boom truck or crane • Backhoe • Air compressor • Electrical generator • Baker tank 	<ul style="list-style-type: none"> • Excavator • Concrete pumper, concrete truck • Paving equipment • Flatbed trucks • Haul trucks • Welding equipment <p>Construction of the ASR-5 and ASR-6 Wells at Fitch Park MBMH area would take approximately 12 months. With the exception of 4 weeks of 24-hour construction for each new ASR injection/extraction well during well development and completion (total of 8 weeks of 24-hour construction), construction of these facilities would occur during the day.</p>
Terminal Reservoir	0 cy	<ul style="list-style-type: none"> • Boom truck or crane • Backhoe • Air compressor • Forklift • Electrical generator • Baker tank 	<ul style="list-style-type: none"> • Excavator • Concrete pumper, concrete truck • Paving equipment • Flatbed trucks • Haul trucks • Welding equipment <p>Construction of the Terminal Reservoir in the former Fort Ord area would take approximately 15 months. Construction would occur during the day.</p>
Highway 68 Interconnection Improvements a) Ryan Ranch–Bishop b) Main System–Hidden Hills	a) 295 cy b) 100 cy	<ul style="list-style-type: none"> • Flatbed trucks • Backhoes • Excavators • Pipe cutting and welding equipment • Haul trucks for spoils transport • Trucks for materials delivery • Compaction equipment 	<ul style="list-style-type: none"> • Baker tank(s) • Pickup trucks • Arc welding machine • Generators • Air compressors • 80-ton crane • Drill rig • Skip loader • Pavers and rollers <p>Construction of these facilities would occur during the day.</p> <p>a) Ryan Ranch–Bishop Interconnection Improvements – 4 months b) Main System–Hidden Hills Interconnection Improvements – 3 months</p>
Carmel Valley Pump Station	200 cy	<ul style="list-style-type: none"> • Excavator • Backhoe • Air compressor • Boom truck or small crane • Generator 	<ul style="list-style-type: none"> • Concrete pump truck • Paving equipment • Flatbed truck • Pavers and rollers • Welding equipment • Baker tank <p>The Carmel Valley Pump Station would be built over a 6-month period. Construction at this site would occur during the day.</p>
Total Excess Spoils and Construction Debris =	Approximately 25,110 cy		Overall Construction Schedule = July 2018 through June 2020 (24 months total)

3.3.4.1 Open-Trench Construction

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

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

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

3.3.4.2 Trenchless Technologies

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

1. Installation of the Source Water Pipeline beneath the TAMC right-of-way at Lapis Road, just north of the CEMEX access Road
2. Installation of the new Desalinated Water Pipeline beneath the TAMC right-of-way near the southern intersection of Lapis Road/Del Monte Boulevard
3. Installation of the new Transmission Main beneath the TAMC right-of-way near Marine Drive/Del Monte Boulevard/Reindollar Avenue

4. Installation of the new Transmission Main (and new Transmission Main Optional Alignment) at Highway 1 and Lightfighter Drive
5. Installation of the Castroville Pipeline under the Salinas River
6. Installation of the Castroville Pipeline under Tembladero Slough

Jack-and-Bore and Microtunneling Methods

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

Drill-and-Burst Method

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

Horizontal Directional Drilling

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

3.3.4.3 Disinfection of Existing and Newly Installed Pipelines

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

3.3.5 Carmel Valley Pump Station

Construction crews would prepare the Carmel Valley Pump Station site by removing vegetation and grading the sites to create a level work area. Construction activities would include pouring concrete footing for foundations; assembling and installing piping, pumps, and electrical equipment; building concrete enclosures and roofs; and performing finish work such as paving, landscaping, and fencing the perimeter of the pump station site. Construction access would be provided via existing access roads and roadways. Construction of the Carmel Valley Pump

Station would result in approximately 40,000 square feet (or 0.9 acre) of temporary disturbance, and 1,300 square feet (0.03 acre) of permanent disturbance.

3.3.6 Terminal Reservoir

To construct the two aboveground water storage tanks at Terminal Reservoir, the construction contractor would clear and grade the Terminal Reservoir site and pour the concrete pads for the tanks. The tanks themselves would be built from rolled steel plates, reinforced concrete, or post-tension concrete.

This paragraph describes the tank construction methods that could be used for construction of the two aboveground water storage tanks at Terminal Reservoir as well as the various water tanks at the MPWSP Desalination Plant site. 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 the outer and inner walls of the steel form. Post-tension steel wire would then be wrapped around the tank.

As noted above in Section 3.2.3.5, this EIR/EIS evaluates an aboveground tank option and an underground tank option for Terminal Reservoir. Both options would result in approximately 6 acres of construction disturbance (see **Figure 3-9b**). In addition, the 1,200-foot-long section of Watson Gate Road extending from General Jim Moore Boulevard to the Terminal Reservoir site, which is now a dirt access road, would be paved (about 0.7 acre). Under either option, no excess spoils would be removed from the site. Any excess material would be reused within former Fort Ord military base close to the Terminal Reservoir site.

3.3.6.1 Terminal Reservoir – Aboveground Tanks Option

Construction workers would pour concrete footings for the approximately 0.75-acre concrete pad and install permanent security fencing around a 3.5-acre area surrounding the aboveground tanks.

3.3.6.2 Terminal Reservoir – Buried Tanks Option

Construction of the buried tanks would not require a concrete pad or installation of security fencing. For this option, after building the buried tanks, the area above the tanks would be graded, revegetated, and partially landscaped.

3.3.7 Installation of Powerlines

New underground and aboveground powerlines would be built between existing powerlines in the area and the proposed facilities. For installation of overhead powerlines, power poles would be sited approximately 300 feet apart. Installation of overhead powerlines would occur in two phases: (1) installing the poles, and (2) installing and tensioning the powerline. Access to each pole would be needed at least twice. The poles would probably be set by digging a hole up to

10 feet deep, placing the pole in the hole, and backfilling. At each of the pole locations, an approximately 50-by-50-foot area would be needed for laydown and assembly, and a limited amount of vegetation might require removal, but grading would not be needed. Construction workers would use standard rubber-tired line trucks to access the alignment and to install and tension the new overhead powerlines. The puller/tensioner would be mounted on a utility truck or on a double-axle trailer. Workers might need to trim or remove some vegetation along the alignment to keep vegetation away from the overhead powerlines.

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

3.3.8 Spoils Management and Disposal

Excavation and construction activities would generate excess soil, rock, and construction material and debris. Although suitable topsoil and subsoils excavated during construction would be used to backfill excavations and restore work areas, project construction is projected to generate approximately 25,110 cubic yards of excess material requiring offsite disposal at the Monterey Peninsula Landfill and Monterey Materials Recycling Facility. The average capacity of haul trucks is assumed to be 10 cubic yards. Spoils hauling and placement would occur throughout the 24-month construction schedule.

3.3.9 Construction Schedule

The proposed project facilities would be built over approximately 24 months, with an expected construction period of July 2018 through June 2020. Construction activities associated with installation of the nine permanent subsurface slant wells and conversion of the test slant well into a permanent well at the CEMEX active mining area would occur over approximately 15 months. Construction activities for the slant wells could occur 24 hours per day, 7 days per week, except for holidays.

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

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

Construction of the proposed Terminal Reservoir would occur over 15 months. Construction of the ASR-5 and ASR-6 Wells would take approximately 12 months. Except for the ASR-5 and

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

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

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

3.4 Operations and Maintenance

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

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

The MPWSP Desalination Plant would operate at an overall recovery rate of 42 percent. Approximately 24.1 mgd of raw seawater would be needed to produce 9.6 mgd of desalinated product water. The RO process would generate approximately 13.98 mgd of brine (including 0.4 mgd of decanted waste effluent). The salinity of the brine is expected to range between 57 and 58 ppt,¹³ which is roughly 71 to 74 percent higher than seawater (Flow Science Inc., 2014). The brine stream would be discharged to Monterey Bay via the existing MRWPCA ocean outfall and diffuser. During wet periods, the brine stream would be blended with treated wastewater effluent from the MRWPCA Regional Wastewater Treatment Plant before discharge. The brine stream could be discharged without dilution for extended periods during dry months when all of the treated wastewater effluent is reclaimed for agricultural irrigation. The amount of treated wastewater effluent available for blending would vary throughout the year.

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

¹³ Based on ocean ambient salinity levels ranging from 33.36 to 33.8 ppt (Flow Science, Inc., 2014).

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

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

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

SOURCE: RBF Consulting, 2013a.

Over the life of the project, for a host of reasons (e.g., mechanical or electrical problems, water quality issues¹⁴, loss of power, etc.), there would be periods when CalAm would need to shut down the MPWSP Desalination Plant. After a shutdown, CalAm might operate the plant with all RO modules in service (at the plant's maximum production capacity of 11.2 mgd) to catch up on production; however, the total annual production would not exceed 9.6 mgd (Svindland, 2014).

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

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

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

¹⁴ Hazardous Algal Blooms would not be a reason for the wells to stop operating. Subsurface intakes are not affected by algal blooms.

**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.

3.4.2 Operation of the ASR System

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

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

Similar to existing operations, CalAm proposes to use the ASR system to store water supplies during wet periods. Both desalinated product water and Carmel River supplies would be chlorinated to drinking water standards at existing CalAm treatment facilities prior to injection. Desalinated product water would flow through the new Desalinated Water Pipeline and new Transmission Main 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. Depending on demand, CalAm would also use existing groundwater production wells in the Seaside Groundwater Basin to recover the banked water. This would increase operational flexibility. CalAm would extract the water via existing production wells under the following conditions to avoid changing the hydraulic gradient or exacerbating localized depressions:

- Seaside Groundwater Basin annual monitoring reports prepared by Seaside Groundwater Basin Watermaster would be reviewed yearly to identify the current location of the groundwater depression in the Santa Margarita Formation, the aquifer unit where the ASR system water would be banked.
- CalAm's use of existing groundwater production wells to recover water stored in the ASR system would be limited to those production wells in the northern subbasin located east of the center point of the groundwater depression. Restricting extraction to the eastern side of the groundwater depression would allow CalAm to extract the banked water before it migrates into the depression and would, therefore, avoid affecting the groundwater depression.
- The order in which the groundwater production wells would be used to extract banked water depends on how close they are to the ASR injection wells. The first priority would be any of the ASR wells, followed in order by the Paralta, Ord Grove #2, Luzern #2, and Playa #3 Wells.¹⁵
- Existing groundwater production wells located outside of the northern subbasin of the Seaside Groundwater Basin (Plumas #4 Well) would not be used to recover banked water because these wells are not directly connected to the aquifer where the ASR water would be stored (CalAm, 2014b).

The stored water would be pumped out of the groundwater basin and conveyed through the ASR Conveyance Pipeline, either 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 elsewhere. CalAm would meet drinking water requirements by disinfecting this water before serving it to customers.

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

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

¹⁵ 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.

3.4.3 Desalinated Water Conveyance Facilities

3.4.3.1 Routine Maintenance of Pump Stations and Pipelines

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

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

3.4.3.2 Interconnections for Highway 68 Satellite Systems

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

3.4.4 Payback to Seaside Groundwater Basin

As part of the adjudication of the Seaside Groundwater Basin, CalAm must provide replenishment water supplies to the basin in an amount equivalent to the quantity of water that CalAm previously pumped in excess of the basin's natural safe yield.¹⁶ In November 2012, the Seaside Groundwater Basin Watermaster and CalAm tentatively agreed to a replenishment schedule of 25 years at a replenishment rate of 700 afy, based on a running 5-year (water year) average. CalAm would meet its obligations via in-lieu recharge or artificial replenishment. Depending on fluctuations in precipitation and water supplies, the actual volume of water replenished during any given year would vary but would be equal to or greater than 700 afy based on a running 5-year average (Watermaster, 2012).

3.4.5 Power Demand

Under existing conditions, the electrical power needed to operate the water supply system in CalAm's Monterey District Service Area is 11,466 million kilowatt hours per year (kWh/yr). That is the baseline electrical demand for the proposed project. With the proposed project, and accounting for the reduction in Carmel River pumping that would occur once the MPWSP Desalination Plant is brought online, the average annual power demand for the Monterey District Service Area would be 63,164 million kWh/yr. Therefore, the net increase in annual electrical

¹⁶ 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.

power demand for water production would be approximately 51,698 million kWh/yr. Electrical power for all of the proposed project facilities would be provided via the PG&E power grid unless CalAm were to secure a separate renewable power source for some or all of its power needs.

The MPWSP would recover energy from the brine stream using pressure-exchanger technology.¹⁷ Energy recovery is a process through which the energy contained in pressurized brine flow is transferred to a portion of the RO source water. This lowers source water pumping requirements and thus lowers overall energy consumption. Under the proposed project, energy recovery using pressure-exchanger technology would substantially reduce overall energy consumption during the RO process. This reduced consumption is reflected in the estimate of annual electrical power demand in the previous paragraph.

3.5 Permits, Approvals, and Regulatory Requirements

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

¹⁷ Additional information on pressure-exchanger energy recovery systems is available at www.energyrecovery.com.

**TABLE 3-8
ANTICIPATED PERMITS AND APPROVALS**

Agency or Department	Permit or Approval	Discussion
<i>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.</i>		
U.S. Army Corps of Engineers (Corps)	Permit under Section 404 of the Clean Water Act (33 USC §1344)	<ul style="list-style-type: none"> 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 under Section 7 of the Federal Endangered Species Act (FESA) (16 USC §1531 et seq.) and Incidental Take Statement Permit in accordance with FESA Section 7, as amended (16 USC §1531 et seq.)	<ul style="list-style-type: none"> The Federal Endangered Species Act requires federal agencies to consult with the USFWS before implementing actions that may result in the incidental take of a federally listed species under their jurisdiction. MBNMS, as NEPA Lead Agency, must consult with the USFWS to determine whether the proposed action of issuing permits and authorizations for the proposed project is likely to adversely affect a federally-listed terrestrial or freshwater animal or plant species under USFWS jurisdiction, or that species' designated critical habitat; jeopardize the continued existence of species that are proposed for listing under FESA; or adversely modify proposed critical habitat. To support the USFWS determination, MBNMS will prepare a Biological Assessment to initiate "formal consultation". The USFWS will issue a Biological Opinion concerning the effects of the project. If the USFWS finds that the project may jeopardize the species or destroy or modify critical habitat, reasonable and prudent alternatives to the action must be considered. The USFWS authorizes the incidental take of federally listed species through an Incidental Take Statement that is supported by, and often attached to, the Biological Opinion, consistent with Section 7 of the FESA.
	Incidental Take Permit under the Migratory Bird Treaty Act (16 USC §§703–711)	<ul style="list-style-type: none"> The incidental take of migratory birds or any part, nest, or eggs of a migratory bird also requires an Incidental Take Permit from the USFWS.
State Historic Preservation Officer	Consultation with State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO) under Section 106 of the National Historic Preservation Act of 1966 (NHPA) (16 USC §470 et seq.)	<ul style="list-style-type: none"> The NHPA requires federal permitting agencies to "take into account" the effects of an action, or a proposed project, on properties included in the National Register of Historic Places or that meet National Register criteria, and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. Thus, as part of the federal consultations required by NEPA, the MBNMS must consult with the SHPO or THPO on behalf of the project applicant.
National Oceanic and Atmospheric Administration (NOAA)	MBNMS superintendent must authorize other agencies' permits within the sanctuary under NOAA's National Marine Sanctuary Program requirements (15 CFR Part 922)	<ul style="list-style-type: none"> Authorization by MBNMS 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 MBNMS. This authorization states that the superintendent agrees with the terms and conditions deemed necessary to protect MBNMS resources and qualities.
	Incidental Take Permit or Incidental Harassment Authorization under Section 104 of the Marine Mammal Protection Act of 1972 (MMPA) (16 USC §1374) Consultation and Biological Opinion under FESA Section 7 (16 USC §1531 et seq.)	<ul style="list-style-type: none"> The MMPA prohibits unauthorized persons from taking marine mammals in U.S. waters, and prohibits unauthorized U.S. citizens from taking marine mammals in international waters. NOAA Fisheries can authorize incidental take that occurs during non-fishery commercial activities. The project applicant must consult with NOAA Fisheries to determine whether the proposed project 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 which determines

**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.)	Incidental Take Statement in accordance with FESA Section 7 (16 USC §1531 et seq.)	<p>whether NOAA Fisheries will conduct a “formal consultation” with the agency and issue a Biological Opinion concerning the effects of the proposed project. If NOAA Fisheries finds that the action may jeopardize, destroy, or modify critical habitat, it will propose reasonable and prudent alternatives to the action. If no jeopardy is found, the action can proceed.</p> <ul style="list-style-type: none"> When a federal permit such as a NMSA permit is required, the incidental take of a federally listed species under NOAA Fisheries jurisdiction requires 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(a)(1)(B).
U.S. Army	Land Use (Army Regulation (AR) 405-80, 200-1)	<ul style="list-style-type: none"> AR405-80 sets forth the authority and prescribes policies for management of the United States of America title to real property under the jurisdiction or control of the Department of the Army, granting the use of that real property to non-Army users. Under AR200-1, real property transactions require preparation of appropriate NEPA documentation per 32 Code of Federal Regulations (CFR) 651. Should a discretionary approval be required for use of U.S. Army property, this EIR/EIS will serve as the NEPA requirement for the action.
State Agencies		
California Public Utilities Commission (CPUC)	Certificate of Public Convenience and Necessity (Cal. Pub. Util. Code §1001 et seq.)	<ul style="list-style-type: none"> This allows the applicant to build and operate the proposed project, and to recover its costs.
	Consultation with NOAA Fisheries under Section 305(b) of the Sustainable Fisheries Act (16 USC §1855(b))	<ul style="list-style-type: none"> If the CPUC approves a project that could adversely affect designated Essential Fish Habitat (EFH), it 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	<ul style="list-style-type: none"> Applications for local agency legislative land use planning approval (such as a proposed county general plan amendment) come before the FORA Board of Directors for a determination of consistency between the application and the Base Reuse Plan.
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)	<ul style="list-style-type: none"> Any discharge of stormwater to surface waters of the United States from a construction project that encompasses 1 acre or more of soil disturbance requires compliance with the General Permit. This includes: <ul style="list-style-type: none"> 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) (cont.)	NPDES permit under Section 402 of the Clean Water Act (33 USC §1342)	<ul style="list-style-type: none"> Discharges of brine into surface waters of the United States, including wetlands and Monterey Bay National Marine Sanctuary, requires an NPDES permit. The <i>Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant</i> (Order No. R3-2014-0013, NPDES Permit No. CA0048551) would be revised to include the brine discharges from the MPWSP Desalination Plant.
	Waste Discharge Requirements under the Porter-Cologne Water Quality Control Act (Cal. Water Code §13000 et seq.)	<ul style="list-style-type: none"> Any activity that results or may result in a discharge of waste that directly or indirectly impacts the quality of waters of the state (including groundwater or surface water) or the beneficial uses of those waters is subject to waste discharge requirements.
	Water Quality Certification under Section 401 of the Clean Water Act (33 USC §1341)	<ul style="list-style-type: none"> Under Section 401 of the Clean Water Act, the RWQCB must certify that actions authorized under Section 404 of the Clean Water Act also meet state water quality standards. Any applicant for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into navigable waters, must provide the licensing or permitting agency a certification that the activity meets state water quality standards.
California Department of Fish and Wildlife (CDFW)	Incidental Take Permit under the California Endangered Species Act (CESA) (Cal. Fish and Game Code §2081)	<ul style="list-style-type: none"> The take of any endangered, threatened, or candidate species may be permitted if it is incidental to an otherwise lawful activity and if the impacts of the authorized take are minimized and fully mitigated. No permit may be issued if the activity would jeopardize the continued existence of the species.
	Lake/Streambed Alteration Agreement (Cal. Fish and Game Code §1602)	<ul style="list-style-type: none"> It is unlawful to substantially divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources, or to use any material from the streambeds, without first notifying the CDFW.
California Coastal Commission (CCC)	Coastal Development Permit under the California Coastal Act (Cal. Pub. Res. Code §30000 et seq.)	<ul style="list-style-type: none"> Development proposed within the Coastal Zone requires a Coastal Development Permit from the CCC, except where the local jurisdiction has approved a Local Coastal Program (LCP). If so, the primary responsibility for issuing permits in coastal areas shifts from the CCC to the local government, although the CCC will hear appeals on certain local government coastal development decisions. Regardless of whether a Coastal Development Permit must be obtained from a local agency under an approved LCP, the CCC retains coastal development permit authority over new development proposed on the immediate shoreline, including intake and outfall structures on tidelands, submerged lands, and certain public trust lands, and over any development that constitutes a "major public works project." (Cal. Pub. Res. Code §§30601, 30600[b][2]).
	Federal Consistency Review under the Coastal Zone Management Act (16 U.S.C. §1456) and Federal Consistency regulations (15 C.F.R. Part 930, Subpart D)	<ul style="list-style-type: none"> In accordance with 15 C.F.R. Part 930, Subpart D, the project applicant may be required to submit a federal consistency certification to the CCC. The CCC must then concur, conditionally concur, or object to the certification; no response from the CCC would be considered a presumed concurrence.

**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 (Cal. Health and Safety Code §116525)	<ul style="list-style-type: none"> The CDPH has permitting authority over the operation of a public water system and oversees the quality of the desalinated water produced.
California Department of Transportation (Caltrans)	Encroachment Permit (Cal. Streets and Highway Code §660 et seq.)	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> DTSC would require soil management plans if contaminated soils are present along the pipeline alignment. Regulatory Requirements outline the concentrations at which soil and groundwater are a California Hazardous Waste. Title 22 would apply if contaminated soil or groundwater arising from trenching are a Hazardous Waste, subject to associated transport and disposal requirements. Under 40 CFR Part 261, concentrations of contaminated soil or groundwater may also be a Federal Hazardous Waste. DTSC must approve digging and excavation in certain portions of the former Fort Ord military base (also see City of Seaside Digging and Excavation Permit).
California State Lands Commission (CSLC)	New Land Use Lease, for portion of the subsurface slant wells located below mean high tide, and Amended Land Use Lease, for use of the MRWPCA outfall and diffuser (Cal. Pub. Res. Code § 1900)	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> The Seaside Groundwater Basin Watermaster must approve injection/extraction activities that would affect the Seaside Groundwater Basin.
City of Seaside	Digging and Excavation Permit	<ul style="list-style-type: none"> Excavations of more than 10 cubic yards within an Ordinance Remediation District, in the Former Fort Ord areas require a permit under Chapter 15.34, Digging and Excavation, of the Former Fort Ord Ordinance. Permit approval is subject to requirements placed on the property by an agreement between the City of Seaside, FORA, and DTSC.
City of Marina	Coastal Development Permit in accordance with the California Coastal Act (Cal. Pub. Res. Code §30000 et seq.)	<ul style="list-style-type: none"> Where the City of Marina has jurisdiction through a Local Coastal Program, it must permit development proposed in the Coastal Zone, and the CCC retains jurisdiction over appeals. Where there is no Local Coastal Program, the CCC retains primary permit authority.
Monterey County Public Works Department	Encroachment Permit (Monterey County Code [MCC] Chapter 14.04)	<ul style="list-style-type: none"> Designated activities within the right-of-way of a county highway require an Encroachment Permit from the director of the Public Works Department, whose decisions may be appealed to the Monterey County Board of Supervisors.
	Tree Removal Permit	<ul style="list-style-type: none"> Removal of any protected trees requires a tree removal permit under Chapter 16.60 of the County's municipal code. Removal of more than three protected trees requires a forest management plan from the Director of Planning.

**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)	<ul style="list-style-type: none"> Monterey County's health officer must issue a written permit before anyone can build new water supply wells. Those decisions may be appealed to the Board of Supervisors.
	Permit to Construct Desalination Facility (MCC Chapter 10.72)	<ul style="list-style-type: none"> Monterey County's director of environmental health, or their designee, must issue a permit before anyone can build or operate a desalination treatment facility (MCC Section 10.72.010). Permit decisions may be appealed to the director of environmental health within 30 days (MCC Section 10.72.080).
Monterey County Planning and Building Inspection Department	Conditional Use Permit (MCC Chapter 21.74)	<ul style="list-style-type: none"> The Monterey County Zoning Ordinance requires a conditional use permit issued by the appropriate planning authority (e.g., the zoning administrator or the Planning Commission) for certain uses in specific zones. The permit decisions may be respectively appealed to the Planning Commission or the Board of Supervisors.
	Coastal Development Permit in accordance with the California Coastal Act (Cal. Pub. Res. Code §30000 et seq.)	<ul style="list-style-type: none"> Where the County has jurisdiction through a Local Coastal Program, it must permit development proposed in the Coastal Zone, and the CCC retains jurisdiction over appeals. Where there is no Local Coastal Program, the CCC retains primary permit authority.
	Grading Permit (MCC Chapter 16.08)	<ul style="list-style-type: none"> Subject to certain exceptions, grading requires a permit from the Monterey County Planning and Building Inspection Department. Grading permit decisions may be appealed to the five-member Board of Appeals, and then to the Board of Supervisors.
	Digging and Excavation Permit (MCC Chapter 16.10)	<ul style="list-style-type: none"> A separate permit from the Monterey County Planning and Building Inspection Department is required for any project activities within the former Fort Ord military base. Permit decisions may be appealed to the Board of Appeals and then to the Board of Supervisors.
	Erosion Control Permit (MCC Chapter 16.12)	<ul style="list-style-type: none"> The Director of Building Inspection must issue an Erosion Control Permit for any project development and construction activities (such as site cleaning, grading, and soil removal or placement) that are causing or are likely to cause accelerated erosion. Permit decisions may be appealed to the Board of Appeals and then to the Board of Supervisors.
Monterey Peninsula Water Management District (MPWMD)	Water System Expansion permit under with Ordinance 96 of the MPWMD Board of Directors	<ul style="list-style-type: none"> Any project activity that would expand the water delivery system within the MPWMD's jurisdiction requires a permit.
Monterey Bay Unified Air Pollution Control District	Authority to Construct permit under Local Rule 3.1	<ul style="list-style-type: none"> Projects that propose to build, erect, alter, or replace any article, machine, equipment, or other contrivance that may emit air contaminants from a stationary source or may be used to eliminate, reduce, or control air contaminant emissions require an authorization to construct permit.
	Permit to Operate under Local Rule 3.2	<ul style="list-style-type: none"> Operating the diesel fuel-powered emergency generators, and any other articles, machines, equipment, or other contrivances that may emit air contaminants from a stationary source requires a permit to operate.

**TABLE 3-8 (Continued)
ANTICIPATED PERMITS AND APPROVALS**

Agency or Department	Permit or Approval	Discussion
Local Agencies (cont.)		
City of Monterey, City of Seaside, City of Marina, City of Pacific Grove	Land Use (including local coastal development permit(s), as necessary), Building, Public Health, Public Works, Tree/Vegetation Removal, and Encroachment Permits, and/or similar department approvals to those discussed above in the context of Monterey County, each issued in accordance with the applicable city's municipal code	<ul style="list-style-type: none"> See related discussions provided in the context of Monterey County.
Transportation Agency for Monterey County (TAMC)	Encroachment Permit	<ul style="list-style-type: none"> 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

References – Description of the Proposed Project

- California American Water Company (CalAm), 2013a. Project A-2, System Interconnections. January 2013.
- California American Water Company (CalAm), 2013b. San Clemente Dam Removal & Carmel River Reroute Project Website. Available online at: www.sanclementedamremoval.org. Accessed November 1, 2013.
- California American Water Company (CalAm), 2014a. Responses to March 31, 2014 Request for Information.
- California American Water Company (CalAm), 2014b. Letter from Eric Sabolsice and Rich Svindland, CalAm, to Eric Zigas, Environmental Science Associates. “Operations Rules for the Injection and Extraction of Desalinated Water into ASR Well System.” Dated May 2, 2014.
- California American Water Company (CalAm), 2014c. Proposed Water Portfolio Data plus energy spreadsheet provided to CPUC by John T. Kilpatrick on March 12, 2014.
- CDM Smith, 2014. Technical Proposal for Design-Build of the Monterey Peninsula Water Supply Project Desalination Infrastructure, Section 3.0 Technical Proposal. October 16, 2013.
- Central Coast Water Shed Studies (CCoWS), 2009. *Fall 2008 Stage-Volume Relationship for Los Padres Reservoir, Carmel River, California*. Publication No. WI-2009-2. May 8, 2009.
- Denise Duffy & Associates, Inc. 2012. *Addendum to the Phase I ASR Environmental Impact Report/Environmental Assessment and Initial Study Checklist for Full Implementation of Aquifer Storage and Recovery (ASR) Water Project 2*. Prepared for Monterey Peninsula Water Management District. April 11, 2012.
- California Department of Water Resources (DWR), 2012. *Final Supplement to the Environmental Impact Report for the San Clemente Dam Seismic Safety Project*, July 2012.
- Flow Science, Inc. 2014. *MRWPCA Brine Discharge Diffuser Analysis FSI 134032 Draft Technical Memorandum*. August 29, 2014.
- Monterey County Superior Court, 2006. California American Water, Plaintiff, vs. City of Seaside, City of Monterey, et al., Case No. M66343, Decision. Filed March 27, 2006.
- Monterey County Superior Court, 2007. California American Water, Plaintiff, vs. City of Seaside, et al., Case No. M66343, Amended Decision, February 9, 2007.
- Monterey Peninsula Water Management District (MPWMD), 2005. Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan and Integrated Coastal Watershed Management Plan, Seaside Groundwater Basin Aquifer Storage and Recovery (ASR) Phase I, July 5, 2005.

- RBF Consulting, 2010. *Final Environmental Assessment and Findings of No Significant Impact, Monterey Bay Regional Water Project – Aquifer Storage and Recovery*. Prepared for U.S. Army Garrison, Presidio of Monterey, and California American Water. September 2010.
- RBF Consulting, 2013a. *Memorandum: Recommended Capacity for the Monterey Peninsula Water Supply Project (MPWSP) Desalination Plant*. January 7, 2013.
- RBF Consulting, 2013b. *Monterey Peninsula Water Supply Project (MPWSP) Project Description Update*. January 9, 2013.
- RBF Consulting, 2013c. *Monterey Peninsula Water Supply Project (MPWSP) Capital and O&M Cost Estimate Update*. January 9, 2013.
- RBF Consulting, 2013d. *MPWSP Temporary Slant Test Well Project Description*, June 25, 2013.
- Regional Water Quality Control Board (RWQCB), Central Coast Region, 2008. General Waiver for Specific Types of Discharges (Resolution No. R3-2008-0010). May 9, 2008.
- Regional Water Quality Control Board (RWQCB), Central Coast Region, 2011. Waste Discharge Requirements National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges with Low Threat to Water Quality. Order No. R3-2011-0223, NPDES Permit No. CAG993001. December 1, 2011.
- Regional Water Quality Control Board (RWQCB), Central Coast Region, 2014. Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant (Order No. R3-2014-0013, NPDES Permit No. CA0048551)
- Seaside Groundwater Basin Watermaster, 2012. Meeting Minutes from November 29, 2012 Board Meeting.
- State Water Resources Control Board (SWRCB), 1995. Order No. WR 95-10: Order on Four Complaints Files Against The California-American Water Company, Carmel River, Monterey County. July 6, 1995.
- Svindland, Richard, 2014. Email from Richard Svindland, Vice President of Engineering at California American Water Company, to Kelly White, Senior Project Manager at Environmental Science Associates. “Desal Plant Planned Feedwater Supply Requirements.” Dated May 30, 2014.

This page intentionally left blank