CHAPTER 2 PROJECT DESCRIPTION

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2.1 INTRODUCTION

2.1.1 Overview of Proposed Project

The Proposed Groundwater Replenishment Project (GWR Project or Proposed Project) consists of two components: the Pure Water Monterey Groundwater Replenishment improvements and operations (GWR Features) that would develop purified recycled water to replace existing urban supplies; and an enhanced agricultural irrigation (Crop Irrigation) component that would increase the amount of recycled water available to the existing Castroville Seawater Intrusion Project (CSIP) agricultural irrigation system in northern Monterey County. Water supplies proposed to be recycled and reused by the Proposed Project include municipal wastewater, industrial wastewater, urban stormwater runoff and surface water diversions. The Proposed Project is being proposed by the Monterey Regional Water Pollution Control Agency (MRWPCA) in partnership with the Monterey Peninsula Water Management District (Water Management District). **Figure 2-1, Project Location Map,** shows the regional location of the Proposed Project.

2.1.1.1 Source Waters for Recycling

The Proposed Project would recycle and reuse water from the following sources:

- *Municipal Wastewater Collection and Treatment System*. MRWPCA collects municipal wastewater from communities in northern Monterey County and treats it at its Regional Wastewater Treatment Plant (Regional Treatment Plant). Currently, most of that wastewater is recycled for crop irrigation in the dry season at an onsite tertiary treatment plant called the Salinas Valley Reclamation Plant. The tertiary-treated wastewater is delivered to growers through a conveyance and irrigation system called the CSIP. During wet periods, recycled wastewater is used only intermittently for crop irrigation. The wastewater that is not recycled for crop irrigation is discharged to the ocean through MRWPCA's existing ocean outfall. The Proposed Project would include improvements that would enable more of the municipal wastewater to be recycled than is possible today; thus, less municipal wastewater would be discharged through the ocean outfall.
- *Salinas Agricultural Wash Water System*. Water from the City of Salinas agricultural industries, 80 to 90% of which is water used for washing produce, is currently conveyed to ponds at the Salinas Industrial Wastewater Treatment Facility for treatment (aeration) and disposal by evaporation and percolation. The Proposed Project would include improvements that would enable the agricultural wash water to be conveyed to the Regional Treatment Plant to be recycled. The Proposed Project also would include improvements at the Salinas Industrial Wastewater Treatment Facility to allow storage of agricultural wash water and south Salinas stormwater in the winter and recovery of that water for recycling and reuse in the spring, summer and fall.
- *Salinas Stormwater Collection System.* Currently, storm water from urban areas in southern portions of the City of Salinas is collected and released to the Salinas River through an outfall near Davis Road. The Proposed Project would include improvements that would enable Salinas Stormwater to be conveyed to the Regional Treatment Plant to be recycled.
- *Reclamation Ditch / Tembladero Slough.* The Reclamation Ditch is a network of excavated earthen channels used to drain natural, urban, and agricultural runoff

and agricultural tile drainage. The Proposed Project would include improvements that would enable water from the Reclamation Ditch watershed to be diverted in two locations--—from the Reclamation Ditch at Davis Road and from Tembladero Slough (to which the Reclamation Ditch is a tributary) near Castroville -- to be conveyed to the Regional Treatment Plant to be recycled.

- *Blanco Drain.* The Blanco Drain collects water from approximately 6,400 acres of agricultural lands near Salinas. The Proposed Project would include improvements that would enable water in the Blanco Drain to be diverted and conveyed to the Regional Treatment Plant to be recycled.
- *Lake El Estero.* The City of Monterey actively manages the water level in Lake El Estero so that there is storage capacity for large storm events. Prior to a storm event, the lake level is lowered by pumping or gravity flow for discharge to Del Monte Beach. The Proposed Project would include improvements that would enable water that would otherwise be discharged to the beach to instead be conveyed to the Regional Treatment Plant to be recycled.

The source waters above would be combined within the wastewater collection system prior to the flow entering the headworks of the Regional Treatment Plant. The flow would be treated using the existing Regional Treatment Plant processes and then further treated and recycled for two purposes, as described in the following paragraphs.

2.1.1.2 GWR Facilities

The primary purpose of the Proposed Project is to provide high quality replacement water to allow California American Water Company (or CalAm)[1] to extract 3,500 acre-feet per year (AFY) more water from the Seaside Basin for delivery to its customers in the Monterey District service area and reduce Carmel River system water use by an equivalent amount. To meet this objective, the GWR Features would create a reliable source of water supply by using source waters described above to produce highly-treated water using existing secondary treatment processes and a new Advanced Water Treatment (AWT) Facility at the Regional Treatment Plant. After treatment by the AWT Facility, the purified recycled water would be conveyed using two pump stations and a new pipeline (the Product Water Conveyance System), and would be injected into the Seaside Groundwater Basin (or Seaside Basin) using a series of shallow and deep injection wells (Injection Well Facilities). Once injected into the Seaside Basin, the treated water would mix with the groundwater present in the aquifers and be stored for future urban use. CalAm would use existing wells and improved potable water supply distribution facilities (CalAm Distribution System) to extract and distribute the GWR water, enabling CalAm to reduce its diversions from the Carmel River system by this same amount. CalAm is under a State order to secure replacement water supplies and cease over-pumping of the Carmel River by January 2017.[2]

[1] CalAm is an investor-owned public utility with approximately 38,500 connections in the Monterey Peninsula area.

[2] In addition, CalAm's ability to produce water from the Seaside Groundwater Basin has been limited by Monterey County Superior Court by an adjudication that imposes a series of pumping reductions designed to limit production of natural basin water to its safe yield.

2.1.1.3 Crop Irrigation

Another purpose of the Proposed Project is to provide additional water to the Regional Treatment Plant that could be recycled at the existing tertiary treatment facility (the Salinas Valley Reclamation Plant), and used for crop irrigation using the CSIP system. For MRWPCA to secure the necessary rights and agreements to use the source waters needed for the Proposed Project, preliminary negotiations with stakeholders lead to MRWPCA proposing to increase the amount of recycled water provided to the area served by the CSIP by approximately 4,750 AFY and up to 5,290 AFY during certain dry years. This amount, in combination with the existing recycling and use of municipal wastewater for crop irrigation of approximately 13,000 AFY[3], would remain less than the treatment design capacity of the Salinas Valley Reclamation Plant of 29.6 million gallons per day (mgd) or an annual use of recycled water for irrigation of approximately 21,600 acre feet (Greater Monterey County Regional Water Management Group, 2013).

The Salinas Valley Reclamation Plant produces tertiary-treated, disinfected recycled water for agricultural irrigation within the CSIP service area. Municipal wastewater and certain urban dry weather runoff diversions treated at the Regional Treatment Plant are currently the only sources of supply for the Salinas Valley Reclamation Plant. Municipal wastewater flows have declined in recent years due to aggressive water conservation efforts by the MRWPCA member entities.

The new sources of water supply developed for the Proposed Project would increase supply available at the Regional Treatment Plant for use by the Salinas Valley Reclamation Plant during the peak irrigation season (April to September). In addition, the Proposed Project would include Salinas Valley Reclamation Plant modifications to allow tertiary treatment at lower daily production rates, facilitating increased use of recycled water during the late fall, winter and early spring months when demand drops below 5 mgd. The Salinas Valley Reclamation Plant can currently only operate within the range of 5 to 29.6 mgd.

The Proposed Project would also include a drought reserve system that would allow increased use of Proposed Project source waters to be used for crop irrigation within the CSIP area during dry years. To accomplish this objective, the GWR Features would be designed to produce, convey, and inject up to 3,700 AFY (up to 200 AFY more than the annual amount needed by CalAm for extraction and delivery to its customers) of water for injection in wet and normal years for up to five (5) consecutive years. This would result in a "banked" drought reserve totaling up to 1,000 AF. During drought periods, MRWPCA would reduce its deliveries of advanced treated water to the Seaside Basin by up to the amount that has been banked in the drought reserve. CalAm would be able to extract the banked water to make up the difference to its supplies, such that its extractions and deliveries would not fall below 3,500 AFY. The water that is not sent to the AWT Facility during drought years would be sent to the Salinas Valley Reclamation Plant to increase supplies for the CSIP irrigation area.

[3] This amount represents the five-year average actual production of tertiary-treated water by the Salinas Valley Reclamation Plant (2009 – 2013).

2.1.2 Project Benefits

Based on the analysis in this EIR, as well as the accompanying feasibility studies and technical reports, the Proposed Project has the potential to provide the following benefits:

- Replace 3,500 AFY of unauthorized Carmel River diversions for municipal use with additional groundwater pumping enabled by recharge of purified recycled water;
- Improve water quality in the Seaside Groundwater Basin;
- Provide up to 5,290 AFY of additional recycled water to Salinas Valley growers for crop irrigation;
- Reduce the volume of water pumped from Salinas Valley aquifers;
- Increase water supply reliability and drought resistance;
- Maximize the use of recycled water in compliance with the state Recycled Water Policy;
- Reduce urban stormwater "first flush" pollutant loads to the Salinas River and Monterey Bay;
- Reduce pollutant loads from agricultural areas to sensitive environmental areas including the Salinas River and the Monterey Bay;
- Help meet requirements for improving water quality in several local impaired water bodies;
- Reduce discharges of treated wastewater to Monterey Bay;

2.2 PROJECT LOCATION

The Proposed Project would be located within northern Monterey County and would include new facilities located within unincorporated areas of Monterey County and the cities of Salinas, Marina, Seaside, Monterey, and Pacific Grove as shown in **Figure 2-1, Project Location Map**. **Figure 2-1** also shows the Seaside Basin and the CalAm Monterey District Service Area. Specific locations for physical components of the Proposed Project are described later in this Chapter.

2.3 PROJECT BACKGROUND

This section provides information on the impetus for the Proposed Project, including a description of the agencies that have primary responsibility for its development and implementation (MRWPCA and Water Management District), an overview of the Seaside Groundwater Basin, an overview of the water resources of the Salinas Valley, a discussion of the relationship of the GWR Features to the proposed CalAm desalination plant, and a discussion of the relationship of the Crop Irrigation component to the Salinas Valley Reclamation Plant and CSIP.

2.3.1 Monterey Regional Water Pollution Control Agency

The Lead Agency for the Proposed Project is the Monterey Regional Water Pollution Control Agency. MRWPCA was established in 1972 under a Joint Powers Authority agreement between the City of Monterey, the City of Pacific Grove and the Seaside County Sanitation District. MRWPCA operates the regional wastewater treatment plant, including a water recycling facility (collectively known as the Regional Treatment Plant), a non-potable crop irrigation water distribution system known as the CSIP, sewage collection pipelines, and 25 wastewater pump stations. Since 1972, other northern Monterey County communities became Joint Powers Authority participants including the cities of Del Rey Oaks, Seaside, Sand City, Marina, and Salinas and the unincorporated communities of Castroville, Moss Landing, and Boronda, in addition to other unincorporated areas in northern Monterey County. The current MRWPCA service area is shown in dark blue in **Figure 2-2, MRWPCA Service Area Map**.

MRWPCA's Regional Treatment Plant is located two miles north of the City of Marina, on the south side of the Salinas River, and has a permitted capacity to treat 29.6 mgd of wastewater effluent.[4] At the Regional Treatment Plant, water is treated to two different standards: (1) Title 22 California Code of Regulations standards (tertiary filtration and disinfection) for unrestricted agricultural irrigation use within a facility known as the Salinas Valley Reclamation Plant, and (2) secondary treatment for permitted discharge through the ocean outfall. Influent flow that has been treated to a tertiary level is distributed to nearly 12,000 acres of farmland in the northern Salinas Valley for irrigation use (recycled water is delivered using a distribution system called the CSIP). The Regional Treatment Plant primarily treats municipal wastewater, but also accepts some dry weather urban runoff and other discrete wastewater flows. Additional information about the existing wastewater collection and conveyance system and the Regional Treatment Plant is provided in **Section 2.5, Overview of Existing Systems**, below.

2.3.2 Monterey Peninsula Water Resources System

The primary objective of the Proposed Project is to replenish the Seaside Groundwater Basin with 3,500 AFY of high quality water to replace a portion of CalAm's water supply as required by state orders. Cal Am currently supplies water for the Monterey Peninsula from

[4] The Regional Treatment Plant currently treats approximately 16 to 17 million gallons per day of municipal wastewater from a total population of about 250,000 in the northern Monterey County area shown generally in **Figure 2-1, Project Location Map**.

the Carmel River and the Seaside Groundwater Basin, and the Monterey Peninsula Water Management District (Water Management District), a partner agency on the Proposed Project, manages these water resources. Both of these sources have historically been over-drafted and are currently being actively managed, as discussed below.

2.3.2.1 Monterey Peninsula Water Management District

The Water Management District is partnering with MRWPCA to fund and manage the studies for the Proposed Project. The Water Management District is a special district, with a seven-member Board of Directors, created by the California Legislature in 1977 for the purposes of conserving and augmenting the water supplies by integrated management of ground and surface water supplies; control and conservation of storm and wastewater; and promotion of the reuse and reclamation of water. Approximately 104,000 people live within the jurisdictional boundary of the Water Management District, which includes the six Monterey Peninsula cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Seaside, and Sand City, and unincorporated communities within Monterey County including Pebble Beach, the Carmel Highlands, a portion of Carmel Valley, and areas adjacent to Highway 68 between Del Rey Oaks and the Laguna Seca area.

The Water Management District manages production and use of water from the Carmel River stored in Los Padres Reservoir, water production in the Carmel Valley aquifer, and groundwater pumped from municipal and private wells in Carmel Valley, the Seaside Groundwater Basin, and other areas within the Water Management District boundary. The Water Management District's jurisdictional area includes portions of watersheds and groundwater basins that lie partially outside the Water Management District political boundary. Activities affecting those areas of the watersheds and basins influence the quantity and quality of water resources within the Water Management District boundary.

The Water Management District regulates public fresh water supply systems within its boundaries, including systems owned by CalAm, the largest purveyor of water in the region. The Water Management District also monitors the production of water from approximately 1,100 public and private wells, of which approximately 800 are currently active. In addition, the Water Management District regulates the creation of new water distribution systems and expansions, water connection permits, and allocation of water to jurisdictions (cities and unincorporated areas). The Water Management District adopts and implements water conservation ordinances, determines drought emergencies and can impose rationing programs. The District also regulates activities within the streamside corridor of the lower 15.5 miles of the Carmel River.

2.3.2.2 Seaside Groundwater Basin

Purified recycled water produced by the Proposed Project's Advanced Water Treatment Facilities would be injected into the Seaside Groundwater Basin, which would enable CalAm to extract the water from the Seaside Basin for delivery to its customers and also would replenish the Basin. The Seaside Groundwater Basin underlies an approximately 19-square-mile area at the northwest corner of the Salinas Valley, adjacent to Monterey Bay (see **Figure 2-3, Seaside Groundwater Basin Boundaries**). The southern boundary of the Seaside Groundwater Basin follows the Chupines fault zone, where a relatively impermeable shale unit of the Monterey Formation is uplifted to near sea level. The western boundary extends to the shoreline, although it is recognized that the aquifers extend offshore under the seafloor. The eastern boundary of the basin is defined by the flow divide in the Paso Robles aquifer, which approximately coincides with the surface drainage between the Canyon del Rey and El Toro Creek watersheds. The northern boundary also follows a groundwater flow divide with the aquifers of the northern Salinas Valley groundwater basin.

The hydrogeology of the Seaside Groundwater Basin has been the subject of numerous studies beginning with a California Department of Water Resources study in 1974. Monitoring data gathered since 1987 shows that water levels have been trending downward in many areas of the basin. A steep decline since 1995 in the northern coastal portion of the basin, where most of the groundwater production occurs, has coincided with increased extraction in that area after the State Water Resources Control Board required CalAm to reduce its Carmel River diversions, and concomitantly maximize its pumping in the Seaside Groundwater Basin.

Figure 2-3, Seaside Groundwater Basin Boundaries shows the following areas/boundaries that are relevant to understanding the physical extent of the Seaside Groundwater Basin: (1) the Seaside subbasin of the Salinas Valley Basin as delineated by the California Department of Water Resources (DWR) in Bulletin 118 (DWR, 2004), (2) the basin boundary used for adjudication based on reconnaissance-level analyses published by the United States Geological Survey in 1982, and (3) the basin boundary as delineated in a report titled *Seaside Groundwater Basin: Update on Water Resource Conditions* (Yates et al., 2005). This more recent and detailed analysis of boundary conditions by Yates et al. is considered to be the most current and accurate documented depiction of the basin boundaries and has been used in the Monterey Peninsula Integrated Regional Water Management Plan (Monterey Peninsula Regional Water Management Group, 2014) and the Final Seaside Groundwater Basin Salt and Nutrient Management Plan (2014). The Seaside Groundwater Basin is divided into four subareas: the Northern Coastal, the Southern Coastal, the Northern Inland, and the Laguna Seca.

Groundwater is currently extracted from approximately 37 wells by 20 well owners in the Seaside Groundwater Basin. CalAm owns 12 wells and pumps approximately 80% of the water produced in the basin. In addition, CalAm and the Water Management District operate a Seaside Groundwater Basin Aquifer Storage and Recovery system that stores excess Carmel River water supplies during the wet season in the groundwater basin and recovers the banked water during the following dry season for consumptive use. The Water Management District estimates that the long-term average yield of the existing Aquifer Storage and Recovery facilities is 1,920 AFY[5], but this varies yearly based on runoff due to the requirement to maintain adequate Carmel River instream flows. Additional informational about the Aquifer Storage and Recovery facilities is found in **Section 2.5, Overview of Existing Systems**, below.

Historical and persistent low groundwater elevations caused by pumping have led to concerns that seawater intrusion may threaten the Basin's groundwater resources. The Seaside Groundwater Basin has experienced chronic overdraft conditions with declining water levels in both of the Basin's primary aquifers that are used for water supply (the deeper, confined Santa Margarita aquifer and the shallower, unconfined Paso Robles aquifer). **Figure 2-4, Seaside Groundwater Basin Groundwater Levels,** shows

[5] CalAm's application to the CPUC for the Monterey Peninsula Water Supply Project presumes a 1,300 AFY average yield for Aquifer Storage and Recovery. This was based on the start-up period for Aquifer Storage and Recovery and the possibility that an amount less than the long-term yield would be available for extraction starting in 2017.

groundwater elevation contour maps of the two aquifers and highlights the areas where water levels have fallen below sea level. Additional information about the groundwater elevations and potential for seawater intrusion is found in **Section 4.10, Hydrology and Water Quality: Groundwater**.

In 2006, an adjudication process (CalAm v. City of Seaside et al., Case No. M66343) led to the issuance of a court decision that created the Seaside Groundwater Basin Watermaster (Watermaster). The Watermaster consists of nine representatives: one representative from each of CalAm, City of Seaside, Sand City, City of Monterey, City of Del Rey Oaks, Water Management District and Monterey County Water Resources Agency; and two representatives from landowner groups. The Watermaster evaluated water levels in the basin and determined that while seawater intrusion has not been observed, current water levels were lower than those required to protect against seawater intrusion. In 2012, water levels were found to be below sea level in the two primary aquifers within the Seaside Groundwater Basin; therefore, the Watermaster recognized that recharge into both aquifers would be beneficial for protection against seawater intrusion.

The adjudication requires CalAm to decrease its operating yield from the basin by 10% triennially until it reaches its allotted portion of the court-defined “natural safe yield” of 1,494 AFY beginning in 2021, as detailed in **Table 2-1, CalAm’s Adjudicated Allocation of Native Seaside Groundwater Basin: Water Years 2006 ‐ 2026**. This natural safe yield was defined by the adjudication as the quantity of groundwater existing in the Basin that occurs solely as a result of natural replenishment. In addition to these reductions in pumping, CalAm is required to “pay back” historic over-pumping and plans to accomplish this by reducing its pumping from the Seaside Groundwater Basin by an additional 700 AFY for 25 years.

Table 2-1
CalAm’s Adjudicated Allocation of Native Seaside Groundwater Basin: Water Years 2006 ‐ 2026

Year	AFY
2006-2008	3,504
2009	3,191
2010-2011	3,087
2012-2014	2,669
2015-2017	2,251
2018-2020	1,820
2021-2023	1,494
2024-2026	1,494

2.3.2.3 Carmel River System

By providing 3,500 AFY of purified recycled water for extraction from the Seaside Groundwater Basin, the Proposed Project would enable CalAm to reduce its diversions from the Carmel River System by an equivalent amount. The 255-square-mile Carmel River Basin is bounded by the Santa Lucia Mountains to the south and the Sierra del Salinas to the north. It flows northwest through the Carmel Valley and drains into Carmel Bay at the northern end of the Big Sur Coast. The Carmel Valley Groundwater Basin lies along the downstream portion of the Carmel River.

There are two reservoirs on the Carmel River -- Los Padres and San Clemente -- the latter of which is scheduled to be removed in 2015. Los Padres Dam and Reservoir are located on the Carmel River, approximately 25 miles upstream of the Pacific Ocean. Los Padres Dam, an earth and rock-fill embankment dam constructed in 1948, has been owned and operated by CalAm since 1966. Constructed with an original storage capacity of 3,030 acre-feet (AF), sedimentation and siltation have reduced the storage capacity of Los Padres Reservoir to approximately 1,785 AF as of 2008 (Monterey Peninsula Water Management District/The Shibatani Group, 2014).

The San Clemente Dam, which impounds San Clemente Reservoir, is also located on the Carmel River, approximately 18 miles from the Pacific Ocean near the confluence of San Clemente Creek. Due to the reservoir's reduced storage capacity and the dam's seismic safety issues, as well as to remove barriers to fish passage, restore ecological functions, and enhance recreational opportunities along the Carmel River, a formal agreement was reached between CalAm and federal, state, and local agencies to cooperatively remove San Clemente Dam (MPWMD, 2014). The removal of San Clemente Dam was initiated in June 2013.

The Carmel Valley Groundwater Basin is primarily located on the valley floor, which is about 16 miles long and varies in width from 300 to 4,500 feet. The groundwater basin consists of younger alluvium and river deposits, and older alluvium and terrace deposits. These deposits are primarily underlain by Monterey Shale and Tertiary sandstone units. The primary water bearing formation is the younger alluvium with a typical thickness of 50 to 100 feet. The younger alluvium consists of boulders, gravel, sand, silt, and clay. The thickness varies from approximately 30 feet in the upper basin to about 180 feet near the mouth of the basin (California Department of Water Resources, 2004). As a result of the significant reduction in usable storage in both reservoirs, CalAm currently relies entirely on multiple wells in the alluvial aquifer along the lower Carmel River for its Carmel River supplies.

2.3.2.4 State Orders to Reduce Carmel River Diversions

The Carmel Valley aquifer, which underlies the alluvial portion of the Carmel River downstream of San Clemente Dam, is about six square-miles and is approximately 18 miles long. In the summer and fall, other private pumpers extract approximately 2,200 to 2,400 AFY of water from the alluvial aquifer, and CalAm extracts approximately 7,880 AFY. Historically, this combined pumping has resulted in dewatering of the lower six miles of the river for several months in most years and up to nine miles of the river in dry and critically dry years. Recharge of the aquifer is derived primarily from river infiltration. The aquifer is replenished relatively quickly each year during the rainy season, except during prolonged periods of extreme drought.

In 1995, the State Water Resources Control Board (SWRCB) issued Order No. WR 95-10, which found that CalAm was diverting more water from the Carmel River Basin than it was legally entitled to divert. The State Board ordered CalAm to implement actions to terminate its unlawful diversions from the Carmel River and to maximize use of the Seaside Groundwater Basin (to the extent feasible) to reduce diversions of Carmel River water. In addition, a subsequent Cease and Desist Order (SWRCB Order Number WR 2009-0060) issued in 2009 requires CalAm to secure replacement water supplies for its Monterey District service area by January 2017 and reduce its Carmel River diversions to 3,376 AFY no later than December 31, 2016. In their recent submittals to the California Public Utilities Commission, CalAm estimates that it needs a total supply source of 15,296 AFY to satisfy the Cease and Desist Order and forecasted demand. In order to do this, CalAm will need to augment its water supplies by 9,752 AFY, which includes water to satisfy a requirement to return water to the Salinas Valley to offset the amount of fresh water in the feed water from the desalination plant's slanted coastal intake wells.

2.3.2.5 Monterey Peninsula Water Supply Project

CalAm, working with local agencies, has proposed construction and operation of a CalAm-owned and operated desalination project (known as the Monterey Peninsula Water Supply Project). CalAm is an investor-owned utility that is regulated by the California Public Utilities Commission (CPUC); the proposed Water Supply Project is identified as CPUC Application A.12-04-019. The Monterey Peninsula Water Supply Project is designed to provide the replacement water CalAm needs to comply with the Cease and Desist Order and the Seaside Groundwater Basin Adjudication and satisfy forecasted demand.

In its application to the CPUC for approval of the Monterey Peninsula Water Supply Project, CalAm proposed a three-pronged approach. The three prongs, or components, consist of: (1) desalination, (2) groundwater replenishment, and (3) aquifer storage and recovery. The CPUC is the CEQA lead agency for the Monterey Peninsula Water Supply Project, and published a Notice of Preparation of an EIR in October 2012. The Notice of Preparation identifies Monterey Peninsula Water Supply Project facilities and improvements, including: a seawater intake system; a 9-mgd desalination plant; desalinated water storage and conveyance facilities; and expanded Aquifer Storage and Recovery facilities.

The Monterey Peninsula Water Supply Project Notice of Preparation also explains that if the GWR Project is timely approved and implemented, CalAm's proposed desalination plant would be a smaller, 5.4 mgd plant and CalAm would enter into an agreement to purchase 3,500 AFY of product water from the Proposed GWR Project. After publication of the Notice of Preparation, CalAm determined that, to fully satisfy the Monterey Peninsula Water Supply Project objectives, the full-sized desalination plant would need to be a 9.6 mgd plant, and the smaller desalination plant, proposed to be constructed if the GWR Project is implemented, would need to be a 6.4 mgd plant (CPUC, 2103).

The Monterey Peninsula Water Supply Project EIR will study both the proposed 9.6 mgd desalination plant and a proposed "MPWSP Variant," which assumes a 6.4 mgd desalination plant and purchase of 3,500 AFY of product water from the GWR Project. The following section further describes the relationship of the Monterey Peninsula Water Supply Project to the GWR Project.

2.3.2.6 Relationship of GWR Project to the Monterey Peninsula Water Supply Project

The Proposed Project is designed to provide part of the replacement water needed for CalAm to comply with the Cease and Desist Order and the Seaside Groundwater Basin Adjudication. The Proposed Project would not produce all of the needed replacement water; the primary goal of the Proposed Project is to produce 3,500 AFY and deliver the water to the Seaside Basin where CalAm can extract the same amount and also reduce its Carmel River diversions by that same amount. The Proposed Project could provide this quantity of replacement water even if the CPUC denies CalAm's application to construct and operate a desalination plant. In other words, the Proposed Project could accomplish its objective, and be useful in reducing Carmel River diversions, independent from approval of CalAm's proposed desalination plant.

While the Proposed Project could proceed as an independent project, the Proposed Project is related to CalAm's project in that the GWR Project would reduce the size of CalAm's proposed desalination plant if such plant is approved by the CPUC. As explained in the preceding section, if the GWR Facilities are timely approved and implemented, CalAm's proposed desalination plant would be reduced in size from a 9.6 mgd plant to a 6.4 mgd plant.

In April 2012, the Water Management District, MRWPCA, and CalAm entered into a *Groundwater Replenishment Project Planning Term Sheet and Memorandum of Understanding to Negotiate in Good Faith* to, among other things, enable planning and environmental evaluation of a groundwater replenishment project with the following provisions:

- to commit themselves to evaluate the ways in which a groundwater replenishment project could be effectively accomplished;
- to commit themselves to negotiate in good faith to reach agreement on such a project, should it be deemed viable;
- for MRWPCA to commit to act as lead agency to achieve California Environmental Quality Act compliance for such a project, should it be deemed viable;
- for Water Management District to assist MRWPCA in providing the necessary financial support for planning and California Environmental Quality Act compliance; and
- to identify non-binding preliminary terms of a Proposed Project agreement.

Subsequent to the Memorandum of Understanding, the principles for evaluating the GWR Facilities have been memorialized in an agreement spearheaded by the Monterey Peninsula Regional Water Authority (Regional Water Authority), and presented to the CPUC. The Regional Water Authority is made up of the mayors of the six Peninsula cities that are served by CalAm and whose purpose is to enable development of a feasible solution to the Monterey Peninsula water supply deficits. The Regional Water Authority adopted a Policy Position Statement on July 11, 2013 that establishes four basic criteria that any water project is expected to satisfy, as well as eight conditions that CalAm would have to meet in order to obtain Regional Water Authority support for a water supply project. The position statement expressed the Authority's support for a "portfolio approach" to water projects, which included the desalination option with groundwater replenishment. Three agreements were reached on July 31, 2013 among the Regional Water Authority, CalAm, and a significant number of interest groups who had previously expressed concerns with elements of CalAm's Monterey Peninsula Water Supply Project. These agreements are called the "Settlement Agreements" and will be considered by the CPUC in its decision-making process for the Monterey Peninsula Water Supply Project. The three agreements address the following items: (1) an agreement that provides for settlement on most of the contested issues, (2) an agreement on the size of the desalination plant proposed in the Monterey Peninsula Water Supply Project for design and planning purposes, and (3) an agreement that relates to design, permitting, and land acquisition for infrastructure that must be constructed by CalAm regardless of which version of the water supply project eventually gets built. The full text of the agreements, as well as the Regional Water Authority Policy Position Statement, may be found on the Authority web site at www.mprwa.org.

2.3.3 Salinas River and Salinas Valley Groundwater Basin

A secondary objective of the Proposed Project is to provide additional water to the Regional Treatment Plant that could be used for crop irrigation through the Salinas Valley Reclamation Plant and CSIP system. The provision of recycled water through the Salinas Valley Reclamation Plant and CSIP reduces use of groundwater from the Salinas Valley

Groundwater Basin for crop irrigation. By increasing source water available for recycling and by enabling the Salinas Valley Reclamation Plant to operate more consistently throughout the year, the Crop Irrigation component of the Proposed Project would further reduce use of groundwater from the Salinas Valley Groundwater Basin.

The Salinas River is the largest river of the Central Coast of California, running 170 miles and draining 4,160 square miles (**Figure 2-5, Salinas River Basin**). It originates near the town of Santa Margarita in San Luis Obispo County and flows north-northwest through Monterey County and into the Monterey Bay. The Salinas River watershed is bounded by the Gabilan Range to the east and the Sierra de Salinas and Santa Lucia Range on the west. The combination of steep terrain on the sides of the watershed and intense farming of the valley floor leads to high sediment loads within the river. The Salinas River has three main tributaries, the Nacimiento, San Antonio and Arroyo Seco Rivers. Many early sources indicate that while high-volume summer flows were largely absent on the lower Salinas River, many reaches had baseflow and substantial summertime pools. Much of the Salinas River was prone to flooding during extreme winter and spring storm events. Levees were constructed to prevent flooding and restrict channel migration on the historic floodplain and adjacent lands.[6] Modifications to the natural hydrologic condition occurred with the construction of reservoirs for flood control and water supply, as listed in **Table 2-2, Reservoirs in the Salinas Basin**.

Table 2-2
Reservoirs in the Salinas Basin

Reservoir Name	Storage Capacity Drainage Area Year Constructed	Owner
Lake Nacimiento	377,900 acre-feet (AF) 362 square miles 1957	Monterey County Water Resources Agency
Lake San Antonio	335,000 AF 344 square miles 1967	Monterey County Water Resources Agency
Santa Margarita Lake	23,843 AF 112 square miles 1941	City of San Luis Obispo

The Salinas Valley Groundwater Basin extends along the river valley floor from Bradley north to the Monterey Bay. It is the primary source of water supply for Monterey County, providing approximately 500,000 acre-feet per year for agricultural, industrial and municipal use. The groundwater basin has four designated subareas, the Upper Valley, Forebay, East Side and Pressure whose geographic extent is shown in **Figure 2-6, Salinas Valley Groundwater Basin**. The groundwater basin is recharged in all but the Pressure Subarea, which has a clay layer above the major water bearing layers. The Pressure Subarea encompasses approximately 140 square miles, and consists of three primary aquifers: the 180-Foot Aquifer, the 400-Foot Aquifer and the 900-Foot (Deep) Aquifer. The 180-Foot and 400-Foot Aquifers connect to the Pacific Ocean, and have experienced seawater intrusion since the 1930's due to groundwater pumping along the coast. The geographic extent of seawater intrusion in these aquifers is shown in **Figure 2-7, Salinas Valley Groundwater Basin Seawater Intrusion Maps**. Several projects have been developed to address this seawater intrusion, as discussed below.

[6] Salinas River Stream Maintenance Program EIR, Executive Summary, Cardno ENTRIX, 2013

2.3.3.1 Monterey County Water Resources Agency

The Monterey County Water Resources Agency is a water and flood control agency with jurisdiction coextensive with Monterey County and governed by the Monterey County Water Resources Agency and Board of Supervisors. The Monterey County Water Resources Agency was established in 1995 pursuant to the Monterey County Water Resources Agency Act, and was formerly the Monterey County Flood Control and Water Conservation District. The Monterey County Water Resources Agency has flood control responsibility for the natural and man-made stormwater channels within the County, including the Carmel, Pajaro and Salinas Rivers, the Blanco Drain and the Reclamation Ditch system in northern Monterey County.

The Salinas Valley Groundwater Basin is not adjudicated, but the Monterey County Water Resources Agency manages the Basin to address the problem of seawater intrusion. As described in **Section 2.3.3.4** below, the Monterey County Water Resources Agency operates Lakes Nacimiento and San Antonio to recharge the groundwater basin, and with MRWPCA operates the CSIP and Salinas Valley Water Project to supply recycled and river water to growers to reduce the use of groundwater for crop irrigation on land overlying the Pressure subarea of the Salinas Valley Groundwater Basin. Funding for operation and maintenance of these facilities originate from zones of assessment and benefit.

2.3.3.2 City of Salinas

The City of Salinas is located in northern Monterey County, approximately ten miles inland from the coast. Salinas is the largest city in Monterey County with a population of over 150,000 people and covering an area of about 23 square miles. Monterey County is called the nation’s salad bowl, and a significant portion of the industry in Salinas is agricultural processing. The City’s water supply comes from wells in the Pressure and East Side Subareas of the Salinas Valley Groundwater Basin. Municipal wastewater from the City is collected at the MRWPCA Salinas Pump Station at the southwest corner of the City and pumped to the MRWPCA Regional Treatment Plant. Wastewater from the agricultural processing industries in the southeastern part of the City is collected separately and treated at the Salinas Industrial Wastewater Treatment Facility, located along the Salinas River at Davis Road.

Most of stormwater from the City flows into the Reclamation Ditch system, which includes Alisal, Gabilan and Natividad Creeks, and stormwater from much of the southern part of the city flows to the Salinas River. The City has a stormwater management program that is implemented to comply with their permit from the Central Coast Regional Water Quality Control Board for Municipal Stormwater Discharges.

2.3.3.3 Marina Coast Water District

The Marina Coast Water District is a county water district established in 1960 pursuant to Water Code §30000, et seq. The District provides water supply and wastewater collection services to the City of Marina and the former Fort Ord. This service area is generally located between the MRWPCA Regional Treatment Plant and the Seaside Groundwater Basin, where the Proposed Project’s injection wells would be located.

Marina Coast Water District’s water supply comes from wells in the Pressure Subarea of the Salinas Valley Groundwater Basin. Wastewater from the District’s service areas is collected and conveyed to the MRWPCA interceptor system, and treated at the Regional Treatment

Plant. Marina Coast Water District is the only member jurisdiction within the MRWPCA with the right to purchase back its municipal wastewater as recycled water.

Water demands on the former Fort Ord are projected to increase with development envisioned in the Fort Ord Base Reuse Plan. To address the need for additional water supply, Marina Coast Water District is developing the Regional Urban Water Augmentation Project (RUWAP). The RUWAP would provide an additional 2,400 AFY of potable and/or recycled water. Marina Coast Water District certified the EIR for the RUWAP in 2005, and approved addenda to the EIR in 2007 and 2008 to address changes to the proposed pipeline alignment, construction assumptions, and water quantities. The trunk main of the RUWAP system is coincident with the Proposed Project's RUWAP Pipeline alignment option. The RUWAP recycled water distribution system has been designed and partially constructed, but is not yet in operation.

2.3.3.4 Salinas Valley Water Projects

Monterey County, acting through the Monterey County Water Resources Agency, has implemented several projects to reduce seawater intrusion along the coast and increase the reliability and availability of water supply. These projects are described in the following sections.

Reservoirs

Nacimiento Reservoir was constructed in 1957 to provide water supply for municipal, domestic, industrial, irrigation and recreational uses. The Monterey County Water Resources Agency may capture up to 180,000 AFY from the Nacimiento River basin, which is approximately 372 square miles in size. The reservoir holds 377,900 acre-feet of water. The agency may use up to 350,000 AFY of diverted and/or stored water for the permitted uses.

San Antonio Reservoir was constructed in 1967 for flood control and to provide water supply for municipal, domestic, industrial, irrigation and recreational uses. The Monterey County Water Resources Agency may capture up to 220,000 AFY from the San Antonio River basin, which is approximately 344 square miles in size. The reservoir holds 335,000 acre-feet of water. The agency may use up to 210,000 AFY of diverted and/or stored water for the permitted uses.

Monterey County Water Resources Agency releases flows from Lakes Nacimiento and San Antonio to recharge the Salinas Valley Groundwater Basin. This practice has resulted in sustained high groundwater levels in the Upper Valley and Forebay Subareas. Before the development of the Salinas Valley Water Project (discussed below), releases were managed to achieve 100% percolation of released flows from the Salinas River into the Salinas Valley Groundwater Basin (that is, no non-stormwater flow in the Salinas River over the Pressure Subarea). Following construction of the Salinas Valley Water Project, increased reservoir releases are made and rediverted for beneficial use at the Salinas River Diversion Facility.

Salinas Valley Reclamation Project/Plant

The MRWPCA Regional Treatment Plant was constructed in 1988 and 1989 and began operation in 1990, treating municipal wastewater to a secondary level and discharging it to the Pacific Ocean. In 1992, MRWPCA and the Monterey County Water Resources Agency formed a partnership to build the Monterey County Reclamation Projects, including the Salinas Valley Reclamation Project recycled water plant (Salinas Valley Reclamation Plant) and the CSIP distribution system. The Reclamation Projects provide recycled water for crop irrigation, reducing the use of Salinas Valley Groundwater Basin groundwater along the coast.

The Salinas Valley Reclamation Plant was constructed in 1995 through 1997, and is located within the Regional Treatment Plant site. At the plant, secondary-treated municipal wastewater is tertiary treated and disinfected using a three-step process (flocculation, filtration and disinfection) and stored in an 80 acre-foot reservoir. The plant has been in operation since 1998, producing up to 15,000 acre-feet per year of recycled, treated wastewater for crop irrigation use. In addition to retarding seawater intrusion and protecting drinking water supplies by reducing use of well water, wastewater recycling also reduces wastewater discharge into the Monterey Bay National Marine Sanctuary.

Castroville Seawater Intrusion Project (CSIP)

The CSIP is the distribution system for the recycled wastewater produced by the Salinas Valley Reclamation Plant. It consists of 45 miles of pipelines and 22 wells, supplying irrigation water to growers on 12,000 acres in northern Monterey County. While the CSIP is designed to reduce groundwater use for irrigation, some groundwater pumping still occurs in the summer months to meet peak day demands which exceed the available amount of recycled water, and in the winter months when demands are smaller than the 5 mgd minimum production rate of the Salinas Valley Reclamation Plant. The CSIP system is owned by the Monterey County Water Resources Agency, but operated by the MRWPCA under contract.

Salinas Valley Water Project and Salinas River Diversion Facility

In 2009, the Monterey County Water Resources Agency constructed the Salinas River Diversion Facility near the Salinas Valley Reclamation Plant. Water released from San Antonio and Nacimiento Reservoirs that does not percolate into the Salinas Valley Groundwater Basin may be rediverted at the Salinas River Diversion Facility. This water is filtered, chlorinated and added to the 80 AF reservoir at the Salinas Valley Reclamation Plant for use in the CSIP system, further reducing the amount of groundwater pumped to meet peak day demands. The facility includes an inflatable rubber dam that creates a seasonal intake pool for the diversion pump station, a metered release weir for maintenance of downstream flows and a fish ladder to allow passage of migratory fish species.

Relationship of the GWR Project to the CSIP

As discussed in detail above, the Salinas Valley Groundwater Basin is experiencing seawater intrusion due to continued overdraft of the aquifer. The CSIP, operated by MRWPCA and by the Monterey County Water Resources Agency supplies recycled water produced at the Salinas Valley Reclamation Plant, Salinas River water, and Salinas Valley groundwater for irrigation of farmland in northern Monterey County. The river water is diverted at the Salinas River Diversion Facility, located southeast of the Regional Treatment Plant. The recycled and river water supplies have replaced between 16,600 AFY and 21,500 AFY of Salinas Valley groundwater pumping for irrigation, depending on the annual irrigation demands[7]. The CSIP system still uses from 2,700 AFY to 8,600 AFY of Salinas Valley groundwater to meet summer peak demands that exceed the available recycled and river

[7] Monthly data from Monterey County Water Resources Agency, presented as calendar year totals.

supplies, and also to meet small winter demands that are below the minimum 5 mgd capacity of the Salinas Valley Reclamation Plant. The Proposed Project would provide up to 5,290 AFY of additional recycled water for distribution through the CSIP system. This would reduce the amount of groundwater used within the existing CSIP system.

The Proposed Project would collect various new source water supplies, which include agricultural wash water from the City of Salinas, stormwater runoff from the Cities of Salinas and Monterey, surface water diversions from the Reclamation Ditch, Blanco Drain and Tembladero Slough, and unused municipal wastewater (see **Section 2.6, Overview of Proposed Project Facilities and Operations** for detailed descriptions). All of the collected source waters would be conveyed to the MRWPCA Regional Treatment Plant, blended with the existing wastewater streams and would then be treated to a primary and secondary level before a portion is diverted to the newly constructed Advanced Water Treatment Facility (AWT Facility). New source water beyond the amount needed to supply 3,500 AFY per year to CalAm would be used as additional influent for the Salinas Valley Reclamation Plant to increase the volume and consistency of recycled water produced during the peak demand months.

The Salinas Valley Reclamation Plant has a design minimum production capacity of 8 mgd. Through operational efficiencies, the plant managers can currently meet demands as low as 5 mgd. Irrigation demands within the CSIP service area below that level have been met in the past using groundwater. As part of the Proposed Project, the Salinas Valley Reclamation Plant would also be modified to meet wet-season irrigation demands as low as 0.5 mgd. This would increase the late fall, winter, and early spring use of secondary-treated municipal wastewater, which would otherwise be discharged through the ocean outfall.

As an additional means of providing recycled water for crop irrigation, the GWR Features would be sized to produce a 1,000 acre-foot drought reserve in addition to producing 3,500 AFY per year for use by CalAm. This would be accomplished by seasonally treating additional source water (when available) during the months of October through March to produce up to 200 acre-feet per year for groundwater injection, until a surplus of 1,000 acre-feet has been injected into the Seaside Groundwater Basin. During dry years, MRWPCA would reduce the amount of treated water that it injects into the Seaside Groundwater Basin during the peak irrigation demand months (April through September), making more of its source water available to recycle and distribute to meet agricultural irrigation demands in the CSIP area. CalAm extractions of GWR-injected water quantities of 3,500 AFY would continue in those years by drawing upon the previously “banked” groundwater up to the amount of drought reserve water previously injected.

2.4 PROJECT OBJECTIVES

The primary objective of the Proposed Project is to replenish the Seaside Groundwater Basin with 3,500 AFY of purified recycled water to replace a portion of CalAm’s water supply as required by state orders. To accomplish this primary objective, the Proposed Project would need to meet the following objectives:

- Be capable of commencing operation, or of being substantially complete, by the end of 2016 or, if after 2016, no later than necessary to meet CalAm's replacement water needs;[8]
- Be cost-effective such that the project would be capable of supplying reasonably-priced water; and
- Be capable of complying with applicable water quality regulations intended to protect public health.

Secondary objectives of the Proposed Project include the following:

- Provide additional water to the Regional Treatment Plant that could be used for crop irrigation through the Salinas Valley Reclamation Plant and CSIP system;
- Develop a drought reserve to allow the increased use of Proposed Project source waters as crop irrigation within the area served by the CSIP during dry years;
- Assist in preventing seawater intrusion in the Seaside Groundwater Basin;
- Assist in diversifying Monterey County's water supply portfolio.

2.5 OVERVIEW OF EXISTING SYSTEMS

This section describes the existing wastewater and water infrastructure systems that are relevant to the Proposed Project. As explained in **Section 2.1, Introduction**, the Proposed Project would recycle and reuse water from the following sources:

- Municipal Wastewater
- Salinas Agricultural Wash Water
- Salinas Stormwater
- Reclamation Ditch/ Tembladero Sough
- Blanco Drain
- City of Monterey Stormwater at Lake El Estero

Existing infrastructure systems that are relevant to these sources of water include the following:

- MRWPCA Regional Treatment Plant (including water recycling facilities at the existing Salinas Valley Reclamation Plant)
- municipal wastewater collection and conveyance systems
- agricultural wash water[9] collection, conveyance and treatment system

[8] The Monterey Peninsula Water Supply Project has been delayed to the point where it is not possible for CalAm to meet the State Water Resources Control Board Cease and Desist Order 2009-60 deadline of December 31, 2016. Accordingly, representatives of the local agencies have been in discussion with the State Board to develop proposals for a CDO extension that would be acceptable to the public and have the potential to obtain State Board approval.

[9] The Salinas Industrial Wastewater Treatment system collects wastewater from agricultural-related businesses; 80 to 90% of the wastewater in this system is estimated to originate from facilities that wash produce. These facilities also include corrugated box manufacturing and fish processing in the southeastern portions of the City of Salinas for conveyance to the City's Salinas Industrial Wastewater Treatment Facility (also referred to herein as the Salinas Treatment Facility) for treatment

- urban dry-weather runoff and stormwater collection and conveyance systems

After source water is treated at the proposed new Advanced Water Treatment Facility, it would be conveyed to new Well Injection Facilities at the Seaside Groundwater Basin. The purified recycled water would then be extracted by CalAm for delivery to its customers. Existing infrastructure systems that are relevant to extraction and delivery of the purified recycled water to urban users include the following:

- Monterey Peninsula Aquifer Storage and Recovery facilities
- CalAm water supply facilities (Monterey District)

In addition, recycled water produced for crop irrigation would be conveyed to growers through the existing CSIP distribution system.

2.5.1 MRWPCA Regional Treatment Plant, including Water Recycling Facilities and Ocean Outfall

The existing MRWPCA Regional Treatment Plant would be used to provide secondary treatment for all source waters. A new Advanced Water Treatment Facility would be constructed at the existing MRWPCA Regional Treatment Plant, and improvements would be made to the existing Salinas Valley Reclamation Plant, which also is located at the Regional Treatment Plant.

MRWPCA currently serves a population of approximately 250,000 and was created in 1972. MRWPCA operates a regional wastewater collection system, treatment, disposal and reclamation facilities. MRWPCA provides services to the cities of Monterey, Pacific Grove, Del Rey Oaks, Sand City, Marina, and Salinas, the Seaside Sanitation District, the Castroville, Moss Landing and Boronda Community Service Districts, and former Fort Ord lands. Each member entity retains ownership and operating/maintenance responsibility for wastewater collection and transport systems up to the point of connection with interceptors and pump stations owned and operated by MRWPCA.

Residential, commercial, and industrial wastewater is conveyed to the MRWPCA Regional Treatment Plant. The plant is located north of the City of Marina and south of the Salinas River in unincorporated Monterey County. The Regional Treatment Plant has an average dry weather design capacity of 29.6 mgd and a peak wet weather design capacity of 75.6 mgd. It currently receives and treats approximately 16 to 17 million gallons per day of wastewater and therefore has capacity to treat additional flows. The Regional Treatment Plant primarily treats municipal wastewater, but also accepts some dry weather urban runoff and other discrete wastewater flows. An aerial image annotated with the key treatment facilities at the Regional Treatment Plant is found in **Figure 2-8, Existing Regional Treatment Plant Facilities Map.**

At the MRWPCA Regional Treatment Plant, water is treated to two different standards: 1) primary and secondary treatment in the Regional Treatment Plant for discharge through the MRWPCA ocean outfall or use as influent for the tertiary treatment system, and 2) Title 22 California Code of Regulations standards (tertiary filtration and disinfection) for unrestricted crop irrigation use.

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and disposal. The wastewater that is currently collected in this system is referred to herein as Agricultural Wash Water.

In most winter months, secondary treated wastewater from the Regional Treatment Plant is discharged to Monterey Bay through the MRWPCA ocean outfall, which includes a diffuser that extends 11,260 feet offshore at a depth of approximately 100 feet. The diffuser on the ocean outfall is designed to convey wet weather flows of up to 81.2 mgd. However, the current permitted capacity of the outfall is 75.6 mgd, which is less than its 81.2 mgd capacity. Wastewater discharges in recent years have decreased to below 5,000 AFY.

Secondary treated effluent from the Regional Treatment Plant is also recycled at the co-located Salinas Valley Reclamation Plant for irrigation of 12,000 acres of farmland in the northern Salinas Valley. The existing facilities at the Regional Treatment Plant, including the Reclamation Plant are designed to produce up to 29.6 mgd of recycled water. The Salinas Valley Reclamation Plant includes an 80 acre-foot storage pond that holds tertiary-treated and Salinas River water before it is distributed to farmland by a distribution system called the CSIP. The use of recycled wastewater for irrigation reduces regional dependence on and use of local groundwater, which, in turn reduces groundwater pumping-related seawater intrusion into the Salinas Valley aquifers.

The amount of tertiary water that has been delivered via the CSIP for crop irrigation has averaged 12,936 AFY (2001 through 2013), but is trending upward. The amount of water delivery each year is dependent on the crops grown and weather patterns. The amount of wastewater available for recycled water production is trending lower during this same period due to reduced flows of wastewater to the Regional Treatment Plant. **Figure 2-9, Historic Regional Treatment Plant Flows,** shows the wastewater influent to the Regional Treatment Plant, Salinas Valley Reclamation Plant production, and ocean outfall discharge flows for the period 1998-2013 in acre-feet per year.

In January 2014, Brezack & Associates, Inc. completed a report that projected municipal wastewater flows to the Regional Treatment Plant to help MRWPCA plan for use of available water for recycling. The MRWPCA has observed that influent to the Regional Treatment Plant has been decreasing for the last several years and thus, a key objective of the analysis was to determine if the trend would continue. The report forecasts wastewater flows based on population and per capita wastewater generation in the service area. A spreadsheet model was developed using historical population and flow data to produce a range of potential projections through the year 2055. **Figure 2-10, Projected Regional Treatment Plant Flows**, shows the results of the analysis. Specifically, the analysis found that municipal wastewater flow to the Regional Treatment Plant is projected to decrease to a range of 19.2 to 17.1 mgd. After 2030, flows may increase to a range of highs between 22.7 and 24.3 mgd. The future increase is dependent upon whether urban growth projections assumed in the 2014 projections are realized. Because it is not certain that such planned urban growth will occur, the Proposed Project source water estimates assume municipal wastewater availability will not increase in the future. If municipal wastewater flows were to increase, less of the other source waters would potentially be used for the Proposed Project. **Section 2.7.1.2, Source Water Operation: Diversion, Treatment and Use**, describes how the Proposed Project would divert source water diversions to augment wastewater flows only up to the demands for purified and/or tertiary recycled water.

2.5.2 Municipal Wastewater Collection and Conveyance Systems

Under the Proposed Project, the existing municipal wastewater collection and conveyance systems would continue to be used to convey wastewater to the Regional Treatment Plant. In addition, several new connections would be constructed to convey the new proposed sources of water to the Regional Treatment Plant. Use of the existing conveyance and collection system would minimize Proposed Project costs and environmental impacts, and would assist in enabling the Proposed Project to be constructed within the short time period needed to accomplish the Project Objectives.

Figure 2-2, MRWPCA Service Area Map provides an overview of the existing MRWPCA wastewater collection and conveyance systems, which includes ten pump stations located throughout the northern Monterey County area, including Castroville and Moss Landing to the north, and City of Salinas to the east. Following are descriptions of the wastewater collection and conveyance systems serving the Salinas and Monterey Peninsula areas.

2.5.2.1 Salinas Wastewater Collection and Conveyance

Several of the new sources (Salinas agricultural wash water, Salinas stormwater runoff, and the Reclamation Ditch waters diverted at Davis Road) would be diverted into the existing wastewater conveyance and collection system prior to flowing into the Salinas Pump Station. MRWPCA's sanitary sewer pump station that serves the City of Salinas (Salinas Pump Station) is located on Hitchcock Road in Salinas, a half mile southeast of the intersection of Blanco and Davis Roads. The Salinas Pump Station was constructed in 1983 and is located within the City of Salinas at the site of the City's former municipal wastewater treatment plant, known as Treatment Plant No. 1 or "TP1." The site is surrounded by unincorporated land within Monterey County that is currently used for agricultural production. Existing stormwater, municipal wastewater (or sanitary sewer), and agricultural wash water pipelines traverse the pump station property in very close proximity to one another, but currently flow to different ultimate endpoints. Only the municipal wastewater enters the Salinas Pump Station at this time.

Municipal wastewater is conveyed from the Salinas Pump Station to the Regional Treatment Plant in a 36-inch diameter interceptor, force main pipeline that is approximately 7.5 miles in length. The average daily and peak flows through the pump station have been relatively constant at approximately 12 mgd and 25 mgd, respectively, over the last several years. Flows at the pump station are highest during the summer months when the population of the City of Salinas expands due to the large migrant workforce associated with the agricultural industry. The City of Salinas's aggressive collection system improvement program has reduced winter infiltration and inflow of stormwater into the municipal wastewater system and thus has also reduced total flows reaching the Salinas Pump Station. MRWPCA conducted flow testing of the Salinas Pump Station in October 2008 as part of the Salinas Pump Station Flow Study. The testing indicated the pump station had a pumping capacity of 32.8 to 35.4 mgd (assuming one pump is out of service), and a capacity of up to 38.5 mgd with all pumps running. **Figure 2-11, Salinas Pump Station Monthly Average Discharge,** shows the Salinas Pump Station average monthly discharge to the MRWPCA Salinas sewer force main (or interceptor) for the period 2003-2012. Independent from the Proposed Project, the City of Salinas and MRWPCA are currently developing plans to address potential emergency sewer overflow situations at the Salinas Pump Station by designing and implementing improvements to the municipal and industrial wastewater collection and conveyance systems to allow wastewater to flow (in emergency situations, only) to the Salinas Industrial Wastewater Treatment Facility for temporary storage before returning to the Salinas Pump Station for conveyance to the Regional Treatment Plant.

2.5.2.2 Monterey Peninsula Wastewater Collection and Conveyance

One of the proposed water sources for recycling (stormwater in Lake El Estero) would be diverted into the existing wastewater conveyance and collection system in Monterey that flows into the Monterey Peninsula interceptor system. The Monterey Peninsula interceptor system collects municipal wastewater that originates as far southwest as Pacific Grove. In Pacific Grove, the wastewater flows through two main MRWPCA-owned pump stations (located at the end of Coral Street and Fountain Street). Then the wastewater flows past the Reeside Pump Station (in the City of Monterey at the end of Reeside Avenue) to the Monterey Pump Station (located in the City of Monterey on the ocean side of Del Monte Boulevard, across from the Naval Postgraduate School). From the Monterey Pump Station, wastewater is conveyed to the Seaside Pump Station in Sand City, from there to the Fort Ord Pump Station near the entrance to the City of Marina, and on to the Regional Treatment Plant. **Figure 2-12, MRWPCA Wastewater Collection System Network Diagram and Pump Station Flows,** summarizes design capacities of all the MRWPCA pump stations and also shows the average dry weather and peak wet weather flows over the last 10 years. Based on this MRWPCA data, the pump stations along the Monterey Peninsula interceptor system operate below their design flows year-round, and have operated at 15 to 20% of their design capacity during an average dry weather flow event and 42 to 50% of their capacity during peak wet weather flow days.

2.5.2.3 Moss Landing and Castroville Wastewater Collection and Conveyance

One of the proposed water sources for recycling (surface water in Tembladero Slough) would be diverted to the existing Moss Landing and Castroville portions of the wastewater conveyance and collection system just prior to where the wastewater flows into the Castroville Pump Station. The Moss Landing and Castroville interceptors and pump stations are north of the Regional Treatment Plant and collect and convey wastewater from those communities to the Regional Treatment Plant, as shown on **Figure 2-12, MRWPCA Wastewater Collection System Network Diagram and Pump Station Flows**. Flows from Moss Landing are pumped through a force main paralleling Highway 1 to the Castroville Pump Station, which is west of Highway 1 and north of Tembladero Slough. Wastewater from Castroville flows to the pump station through a gravity pipeline. The Castroville Pump Station pumps wastewater through the Castroville interceptor to the MRWPCA Regional Treatment Plant. The Castroville Pump Station is designed to pump 2.7 mgd and the current annual average flow is 0.7 mgd.

2.5.3 Agricultural Wash Water Generation, Collection/Conveyance, and Treatment

Existing operations and infrastructure relevant to the proposed Salinas agricultural wash water diversion are described in this section. The City of Salinas (hereafter, “Salinas”) operates an industrial wastewater conveyance and treatment system that serves approximately 25 agricultural processing and related businesses located east of Sanborn Road and south of U.S. Highway 101. This wastewater collection system is completely separate from the Salinas municipal wastewater collection system and includes 14-inch to 33-inch diameter gravity pipelines that flow to the Salinas Pump Station Diversion site, and then flow into a 42-inch gravity pipeline to the Salinas Industrial Wastewater Treatment Facility (Salinas Treatment Facility). Over 80% of the wastewater flows in this system are from fresh vegetable packing facilities (typically, wash water used on harvested row crops). The remainder of flows originate from businesses associated with seafood processing, refrigerated warehousing, manufactured ice, preserves (frozen fruits, jams and jellies) and corrugated paper boxes. Wastewater is conveyed in a pipeline that traverses near the

Salinas Pump Station to the Industrial Treatment Facility located adjacent to the Salinas River, downstream of the Davis Road crossing. The Salinas Treatment Facility consists of an influent pump station, an aeration lagoon, percolation ponds, and rapid infiltration beds to treat, percolate and evaporate the industrial wastewater.

All industrial wastewater entering the ponds passes through a bar screen at the influent pump station with a peak design flow of 6.8 mgd. Piping and valves permit the water to be pumped to the aeration lagoon, the percolation ponds, or the rapid infiltration beds; however, the National Pollutant Discharge Elimination System permit for the facility requires aeration as part of the treatment process. Biological treatment in the aeration lagoon includes aerobic decomposition to about 1/3 of the water depth using twelve 50-horsepower surface aerators and natural anaerobic decomposition in the lower layers.

The wastewater is treated using aeration then flows by gravity to three percolation ponds in series (from east to west, Ponds 1 through 3). Water levels must be maintained with no less than 1-foot of freeboard. These water levels are maintained by pumping to rapid infiltration beds, including permanent beds (also referred to as “drying beds” north of Pond 3) and temporary rapid infiltration basins located between the ponds and the Salinas River. A conceptual process flow schematic of the Salinas Treatment Facility is shown in **Figure 2-13, Salinas Industrial Wastewater Treatment Facility Process Flow Schematic** and locations of existing industrial wastewater infrastructure is shown in **Figure 2-14, Salinas Industrial Wastewater Treatment System Location Map**.

The Salinas Treatment Facility operates year-round, with a peak monthly inflow during summer months of approximately 3.5 to 4.0 mgd (annual average of approximately 3 mgd). This summer peak corresponds with the peak agricultural harvesting season in the Salinas Valley. In recent years, substantial flows to the Salinas Treatment Facility have continued during the winter months due to the importation of agricultural products from Arizona for processing in the facilities that discharge wastewater to this system.

2.5.4 Stormwater Runoff, Agricultural Drainage Collection and Conveyance

The existing systems for the collection and conveyance of various types of runoff and agricultural land drainage that are relevant to the Proposed Project include the following systems:

- Facilities that capture and discharge City of Salinas stormwater to the Salinas River (see **Section 2.5.4.1**),
- Watershed characteristics (natural, urban, and agricultural) of the Reclamation Ditch system (see **Section 2.5.4.2**),
- Agricultural runoff and tile drain systems contributing to the Blanco Drain system (see **Section 2.5.4.3**), and
- Stormwater and wastewater collection systems near Lake El Estero (see **Section 2.5.4.4**).

The following sections describe these systems and their characteristics.

2.5.4.1 City of Salinas: Urban Runoff to Salinas River

The Proposed Project would capture and divert runoff from the City of Salinas. Urban runoff from the southwestern part of the City of Salinas flows through pipes that cross nearby the

Salinas Pump Station site southeast of the intersection of Blanco and Davis Roads. The runoff system currently drains an area of about 2.5 square miles and eventually flows to the Salinas River through a 66-inch gravity pipeline. The drainage area is virtually all within the developed portion of Salinas and does not appear to intercept water from non-urban areas. Therefore, flows are likely to be almost entirely from urban runoff. The climate of Salinas is semiarid, with the rainy season occurring from November through March. **Table 2-3, Estimated Urban Runoff from the City of Salinas to Salinas River (acre-feet)** shows an estimate of stormwater runoff from the City's Salinas River watershed. No flow gage or other measurements of runoff exist for this watershed, so a hydrologic analysis using rainfall gage data, hydrologic soil group information, and land use data was conducted to develop estimates of surface runoff into the Salinas River from the City of Salinas (Schaaf & Wheeler, 2015a).

Table 2-3
Estimated Urban Runoff from the City of Salinas to Salinas River (acre-feet)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Average	8	26	53	53	45	34	19	2	0	0	0	1	242
Maximum	65	229	390	414	530	147	238	31	10	8	22	18	857

Salinas has an existing municipal stormwater permit issued by the Central Coast Regional Water Quality Control Board that requires reductions in pollutant loads to nearby surface water bodies, including the Salinas River and the Reclamation Ditch and its downstream receiving waters, such as Tembladero Slough. The latter water bodies are described in the following section.

2.5.4.2 Reclamation Ditch and Tembladero Slough Watersheds: Mixed Runoff

Another Proposed Project source of water, the Reclamation Ditch, created between 1917 and 1920, is a network of excavated earthen channels used to drain surface runoff and facilitate agricultural use of the surrounding lands. The Reclamation Ditch watershed is approximately 157 square miles that includes headlands, agricultural areas, the City of Salinas and portions of Castroville and Prunedale. It collects water from Alisal Creek at Smith Lake southeast of the City of Salinas, Gabilan and Natividad Creeks within Salinas at Carr Lake, and Santa Rita Creek west of Salinas. The Reclamation Ditch is a major drainage channel that flows from east to west through Salinas and continues west where it drains into Tembladero Slough, thence to the Old Salinas River Channel, and ultimately into Moss Landing Harbor through the Potrero Road Tide Gates (see **Figure 2-15, Reclamation Ditch Watershed Boundary**).

Alisal, Gabilan and Natividad Creeks are seasonal in their upper reaches. The Reclamation Ditch is perennial downstream of agricultural and urban development. However, the presence of dry-season flow is a consequence of dry-season urban discharges and agricultural runoff and tile drain water (Casagrande and Watson, 2006). There is a United States Geological Survey gage station on the Reclamation Ditch at San Jon Road, approximately one mile west of Salinas. Flow data from that gage is provided in **Table 2-4, United States Geological Survey Gage, Reclamation Ditch at San Jon Road, period 2003 to 2013 (AF)**. The lower reaches of the system, including Tembladero Slough and the Old Salinas River Channel, are tidally influenced.

Table 2-4
United States Geological Survey Gage, Reclamation Ditch at San Jon Road, period 2003 to 2013 (AF)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Average	300	293	1,044	1,329	1,203	1,598	905	263	198	193	181	133	7,640

2.5.4.3 Blanco Drain Watershed: Agricultural Runoff and Tile Drainage

The Blanco Drain is a proposed source of water for the Proposed Project. The Blanco Drain is a man-made reclamation ditch draining approximately 6,400 acres of agricultural lands east of the City of Salinas. The watershed for the Blanco Drain is between the Salinas River and Alisal Slough, and discharges to the Salinas River at river mile 5 (see **Figure 2-16, Blanco Drain Storm Drain Maintenance District**). The Blanco Drain is separated from the Salinas River by a flap gate, which prevents high-water conditions in the Salinas River from migrating up the Blanco Drain channel. Summer flows in the Blanco Drain are generally tile drainage and runoff from irrigated agriculture. Winter flows include stormwater runoff, although some fields remain in production and are irrigated year-round.

In 2009-2010, the Monterey County Water Resources Agency constructed the Salinas River Diversion Facility downstream of the Blanco Drain. The Salinas River Diversion Facility includes an inflatable rubber dam that impounds water during the summer months to supply the diversion pump station. To overcome the backwater into the Blanco Drain channel, a new slide gate and pump station were installed at the lower end of the Drain, several hundred feet above the confluence with the Salinas River. The pump station lifts Blanco Drain flows past the slide gate and into the gravity portion of the channel. **Table 2-5, Blanco Drain Flow Availability Estimate (acre-feet)** shows an estimate of flows in Blanco Drain (Schaaf & Wheeler, 2014b).

Table 2-5
Blanco Drain Flow Availability Estimate (acre-feet)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Totals
Estimated Flow Availability	209	223	246	252	225	274	277	244	184	168	133	185	2,620

2.5.4.4 Monterey Peninsula: Urban Runoff

The Proposed Project includes diversion and use of stormwater that presently is stored at Lake El Estero and discharged to nearby beaches before large storm events. The cities of the Monterey Peninsula generally use storm drain infrastructure to collect, convey and discharge urban runoff that does not sheet flow to natural areas. Infrastructure for collection and discharge of urban runoff in the cities does not connect to the wastewater collection system, except in the City of Pacific Grove where the City has implemented three phases of a dry weather Urban Runoff Diversion Project in order to reduce pollutant discharges and comply with the requirements of the Areas of Special Biological Significance program (City of Pacific Grove, plans and environmental documents for Urban Runoff Diversion Project Phases 1 through 3).[10] The cities of Pacific Grove and Monterey are also in the planning

[10] The three phases of the Urban Runoff Diversion Project include redirecting dry weather flows in the storm drain system to the sanitary sewer from a 652-acre watershed area under normal non-

stages of an additional wet weather diversion project that would expand the existing dry weather diversion facilities as part of their efforts to comply with additional Areas of Special Biological Significance requirements.[11]

Within the watersheds of the Areas of Special Biological Significance, surface storage locations for detaining stormwater are limited or non-existent in the cities of Pacific Grove and Monterey. In addition, much of the soils underlying Pacific Grove and Monterey are granitic, and thus, have a very low ability to infiltrate and reduce runoff. Large flows of stormwater runoff become available within a very short time after initiation of a storm event. The City of Monterey's stormwater system includes the use of two lakes, Del Monte Lake and Lake El Estero. The City actively manages the water levels in these lakes so that there is storage capacity for large storm events. Prior to a storm event, the lake levels are lowered by pumping or gravity flow for discharge to the beaches north of the lakes. Additional information about existing Monterey Peninsula stormwater collection systems is presented in **Section 4.11, Hydrology/Water Quality: Surface Water**.

During the 2012 to 2013 wet season, MRWPCA, the Water Management District, and the City of Monterey partnered to collect flow gage data of runoff from Lake El Estero. For the purpose of this EIR, Schaaf & Wheeler prepared hydrologic calculations using rainfall gage data, National Resource Conservation Service hydrologic soil group information, and land use data to develop estimates of surface runoff into Lake El Estero (Schaaf & Wheeler, 2014a). **Table 2-6, Estimated Monthly and Annual Historic Urban Runoff into Lake El Estero with Existing Infrastructure (AF)** shows an estimate of stormwater runoff from the Lake El Estero watershed, a 2,810-acre drainage basin.

Table 2-6
Estimated Monthly and Annual Historic Urban Runoff into Lake El Estero with Existing Infrastructure (AF)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Average	70	52	40	16	2	1	0	0	2	9	30	45	268
Maximum	273	653	246	142	31	17	9	4	72	59	199	215	1,232

The City of Monterey is a member city in the Monterey Regional Stormwater Management Program,[12] which collectively monitors systems in Northern Monterey County under the statewide General Permit for the Phase II Small Municipal Separate Storm Sewer System (MS4) Program, and is described in detail at the State Water Resources Control Board website.[13]

rainfall conditions (typically, April 1 – November 1 of each year). Urban Runoff Diversion Project Phase 1, completed in 2004, redirected seasonal urban runoff collected from a 487-acre drainage area into the sanitary sewer system at two locations. The Urban Runoff Diversion Project Phase 2, completed in 2006, expanded the Phase 1 system by collecting surface runoff from an additional 99 acres before feeding directly into the Phase 1 pipelines. The Urban Runoff Diversion Project Phase 3 is currently being constructed to pump discharges from an additional 66 acres of the watershed into the storm drain facilities installed under Phase 2, which then connect to the facilities installed in Phase 1.

[11] More information is provided at: http://www.monterey.org/Portals/1/peec/stormwater/Monterey-PG_ASBS_Stormwater_Management_Project_DEIR.pdf (Accessed February 2014).

[12] See www.montereysea.org for program description and details

[13] State Water Resources Control Board, accessed January 2014.

2.5.5 CalAm Monterey District Water Supply Facilities

Several existing CalAm infrastructure facilities would be used to extract purified recycled water produced by the Proposed Project from the Seaside Groundwater Basin and convey the water to urban customers.

2.5.5.1 Seaside Groundwater Basin Extraction and Treatment Facilities

CalAm's operations within the Seaside Groundwater Basin are described above in **Section 2.3.2.2** and in more detail in **Section 4.10, Hydrology/Water Quality: Groundwater.**

2.5.5.2 Aquifer Storage and Recovery Project

Under the Proposed Project, existing CalAm wells, including four wells used for the Monterey Peninsula Aquifer Storage and Recovery Project, would be used to extract purified recycled water from the Seaside Groundwater Basin. **Figure 2-17, Aquifer Storage and Recovery Project Location Map,** shows the location of the Aquifer Storage and Recovery wells in the Seaside Groundwater Basin. The Monterey Peninsula Aquifer Storage and Recovery Project is cooperatively implemented by the Water Management District and CalAm, and involves the diversion of excess winter/spring flows from the Carmel River system for recharge of, storage in and subsequent recovery from the Seaside Groundwater Basin. Carmel River water is diverted when there is excess water in the River (i.e., minimum flow criteria are met), treated by CalAm to potable drinking water standards, conveyed in the CalAm distribution system, and then injected into the Santa Margarita aquifer of the Seaside Groundwater Basin via four existing Aquifer Storage and Recovery wells located at two Aquifer Storage and Recovery facilities. The injected water is stored within the aquifer and subsequently extracted and distributed by CalAm for use during dry periods. The overall objective of the Aquifer Storage and Recovery Project is to facilitate the conjunctive use of water supplies in the Carmel River system and Seaside Groundwater Basin that would benefit the resources of both systems.

Aquifer Storage and Recovery operations generally consist of three components or phases: (1) injection of drinking-quality water into the aquifer through the Aquifer Storage and Recovery wells; (2) storage of the injected water within the aquifer; and, (3) recovery of the stored water by pumping at one or more of the Aquifer Storage and Recovery wells or at CalAm production wells within the basin. Periodic samples of the injected, stored, and recovered waters are collected from the Aquifer Storage and Recovery wells and associated monitoring wells and analyzed for a variety of water-quality constituents pursuant to requirements of the Central Coast Regional Water Quality Control Board oversight of the Aquifer Storage and Recovery Project.

The first phase (Phase 1) of the Aquifer Storage and Recovery Project included two injection/extraction wells at the Santa Margarita site and was approved in 2006 and operational in 2007; however, test injections began in 2001 and test extractions began in 2003. Phase 1 operational injections began in Water Year 2007-2008 and extractions from the Aquifer Storage and Recovery wells for use in the CalAm system began in Water Year 2010-2011. Phase 2 of the project has been constructed and includes operation of two additional permanent wells (the 3rd and 4th Aquifer Storage and Recovery Wells, or ASR-3

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http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml and ASR-4) at the Seaside Middle School site. The new ASR wells that will be operational within 2015 or early 2016 and will serve as additional extraction wells from which CalAm can extract existing groundwater in the Seaside Basin, and in the future, they may be used to extract the water that would be injected by the Proposed Project, mixed with existing native groundwater and other waters. In addition, if the Monterey Peninsula Water Supply Project desalination project is built, the wells would extract desalinated water that is proposed to be injected into the Seaside Basin using the 5th and 6th ASR wells that are proposed to be built as part of that project.

2.5.5.3 CalAm Monterey District Distribution Facilities and Demands

Under the Proposed Project, existing CalAm distribution systems would be used to convey the purified recycled water extracted from the Seaside Basin to CalAm's customers. CalAm's Monterey District includes a "main" system and several satellite systems, and has approximately 38,500 connections. CalAm provides water service to most of the Monterey Peninsula, including the cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside, and the unincorporated areas of Carmel Highlands, Carmel Valley, and Pebble Beach via the Monterey District's water distribution system. This is referred to as the Main Monterey System and its location is shown in **Figure 2-1, Project Location Map**. In addition to the main system, CalAm also operates the following satellite water systems that provide water to customers within Monterey County: Bishop/Pasadera, Ambler, Hidden Hills, Ryan Ranch, Toro, Chualar, and Ralph Lane. CalAm's Monterey District service area is supplied by the Carmel River system and groundwater from the coastal subareas of the Seaside Groundwater Basin. The Bishop/Pasadera, Hidden Hills, and Ryan Ranch systems also rely on groundwater from the Seaside Groundwater Basin. The remaining systems (Toro, Chualar, and Ralph Lane) do not rely on either the Carmel River or the Seaside Basin.

Table 2-7, CalAm Monterey District Service Area Demand shows total annual demand in CalAm's Monterey system over the 5-year period from 2007 to 2011. Annual demand during the time period of 2007 – 2011 ranged from 11,989 AF to 14,644 AF, and averaged 13,291 AF. The maximum annual demand during this time period (14,644 AF in 2007) occurred before the economic downturn (estimated to have occurred in 2008), before the 3-year drought of 2012 - 2015, and before implementation of additional water conservation measures which were initiated in response to the SWRCB Cease and Desist Order.

Table 2-7
CalAm Monterey District Service Area Demand

Calendar Year (Jan-Dec)	Total Annual Demand (AF)
2007	14,644
2008	14,460
2009	13,192
2010	12,171
2011	11,989
5-Year Average	**13,291**

The following are the components of CalAm's forecasted total customer demand in its Monterey District of 15,296 acre-feet per year, as described by the California Public Utilities

Commission in the Plant Size and Operation Agreement for CalAm's Monterey Peninsula Water Supply Project (California Public Utilities Commission, 2013):[14]

- 13,290 AF 5-year customer demand
- 500 AF for economic recovery
- 325 AF for Pebble Beach buildout
- 1,181 AF for legal lots of record

Based on total forecasted demand of 15,296 acre-feet per year, CalAm estimates that new water supplies of 9,752 acre-feet per year would be required, along with use of the following existing sources:

- Supply from Carmel River Wells - 3,376 AF
- Extraction from Seaside Groundwater Basin – 774 AF[15]
- Average Aquifer Storage and Recovery Capacity - 1,300 AF
- Sand City Plant Firm Yield to CalAm – 94 AF

Because the CalAm system was initially built to deliver water from Carmel Valley to the Monterey Peninsula cities, a hydraulic trough currently exists in the CalAm peninsula distribution system that prevents water delivery at adequate quantities from the Seaside Groundwater Basin to most of Monterey, and all of Pacific Grove, Pebble Beach, Carmel Valley, and the City of Carmel areas. The hydraulic trough is an area of the CalAm distribution system with very small pipe diameters and very low elevation such that the required high flow rates of water and high pressures needed to convey water from the north between two pressure zones of the system cannot be achieved with the current infrastructure. This system deficiency would need to be addressed regardless of whether the Proposed Project is implemented by itself, CalAm's Monterey Peninsula Water Supply Project with the full-size desalination plant is implemented without the GWR Project, or the variant to the Monterey Peninsula Water Supply Project that includes both a smaller desalination plant and the GWR Project is implemented.

2.5.5.4 CalAm Historic Water Production

Table 2-8, CalAm Water Production for Water Years 2006 – 2014 (in Acre-Feet) presents the CalAm water production for their Monterey District Service Area, including the "Main System" and the "Laguna Seca Subarea" (LSS) that draws water exclusively from the Seaside Basin.

[14] California Public Utilities Commission. Filings for Proceeding A1204019 (referred to as one of the "Settlement Agreements") filed 7/31/13) and found at http://www.watersupplyproject.org/Websites/coastalwater/files/Content/3877658/Sizing_Agreement_PDFA.pdf, accessed November 2013.

[15] CalAm and the Seaside Groundwater Basin Watermaster reached an agreement on the replenishment of CalAm's historical overpumping of the Seaside Groundwater Basin per the adjudication decision. The agreement requires California American Water to reduce extraction from the Basin by 700 acre-feet of water annually on a 5-year average basis for an estimated twenty five years. The reduced annual extraction volume from the Seaside Groundwater Basin would be 774 acre-feet. The reduction in extraction volume is not treated as demand but is instead treated as a reduction in supply. (Joe Oliver, MPWMD, October 30, 2014)

Table 2-8
CalAm Water Production for Water Years 2006 – 2014 (in Acre-Feet)

	Production by Sources						Production by CalAm System	
Water Year	Sand City Desal Project	ASR Projects Recovery	Seaside Basin Coastal Subareas	Seaside Basin Laguna Seca Subarea	Carmel Valley Aquifer	Carmel River	Main System (all sources except LSS)	All Sources Total (Main System plus LSS)
2006	--	0	3,263	446	10,542	0	13,805	14,251
2007	--	0	3,625	435	10,443	0	14,068	14,503
2008	--	60	3,329	534	10,600	0	13,989	14,523
2009	--	182	2,449	516	10,285	0	12,916	13,432
2010	46	0	3,283	430	8,673	0	12,002	12,432
2011	276	1,111	3,034	382	7,441	0	11,862	12,244
2012	242	1,224	2,701	370	7,515	0	11,682	12,052
2013	188	644	2,700	377	7,713	0	11,245	11,622
2014	179	0	2,871	362	7,744	0	10,793	11,154
SUMMARY STATISTICS FOR SELECTED PERIODS								
Water Years 2006-2014								
Mean	NA	358	3,028	428	8,995	NA	12,485	12,913
Median	NA	60	3,034	430	8,673	NA	12,002	12,432
Minimum	NA	0	2,449	362	7,441	NA	10,793	11,154
Maximum	NA	1,224	3,625	534	10,600	NA	14,068	14,523
Water Years 2010-2014								
Mean	186	596	2,918	384	7,817	NA	11,517	11,901
Median	188	644	2,871	377	7,713	NA	11,682	12,052
Minimum	46	0	2,700	362	7,441	NA	10,793	11,154
Maximum	276	1,224	3,283	430	8,673	NA	12,002	12,432

NOTES:
(1) ASR = Aquifer Storage and Recovery; CVA = Carmel Valley Aquifer; CR = Carmel River; LSS = Laguna Seca Subarea of Seaside Basin. Carmel River System production values include reductions for water produced for injection into the Seaside Basin.
(2) Carmel River System and Seaside Basin production values were compiled by the MPWMD from monthly production reports submitted by the California American Water (Cal-Am), Monterey Division.
(3) "NA" in the "Summary Statistics for Selected Periods" sections indicate "Not Applicable" when production data for that source are not included for the entire indicated period.
Source: MPWMD, 2014.

2.6 Overview of Proposed Project Facilities and Operations

2.6.1 Proposed Project Facilities Overview

This and the following sections describe the new physical components of the Proposed Project. **Figure 2-18, Proposed Project Facilities Overview** shows an overview of the Proposed Project facilities and **Figures 2-19 and 2-20** provide overall project process flow schematics to illustrate the existing and proposed facilities and relevant water flow paths by type of water. **Figure 2-19, Proposed Project Flow Schematic – Source Water to**

Treatment, shows the flow paths and facilities to be used for collection and conveyance of source water to the Regional Treatment Plant. **Figure 2-20, Proposed Project Flow Schematic –Regional Treatment Plant**, shows the flows into and out of the Regional Treatment Plant. The following project components are described in the subsections below:

- *Source water diversion and storage* – facilities to enable diversion of new source waters to the existing municipal wastewater collection system and conveyance of those waters as municipal wastewater to the Regional Treatment Plant to increase availability of wastewater for recycling. Modifications would also be made to the existing Salinas Industrial Wastewater Treatment Facility to allow the use of the existing treatment ponds for storage of excess winter source water flows and later delivery to the Regional Treatment Plant for recycling.
- *Treatment facilities at Regional Treatment Plant* – use of existing primary and secondary treatment facilities at the Regional Treatment Plant, as well as new pre-treatment, advanced water treatment (AWT), product water stabilization, product water pump station, and concentrate disposal facilities, and modifications to the Salinas Valley Reclamation tertiary treatment plant.
- *Product water conveyance* – new pipelines, booster pump station, appurtenant facilities along one of two optional pipeline alignments to move the product water from the Regional Treatment Plant to the Seaside Groundwater Basin injection well facilities.
- *Injection well facilities* – new deep and vadose zone wells to inject Proposed Project product water into the Seaside Groundwater Basin, along with associated back-flush facilities, pipelines, electricity/ power distribution facilities, and electrical/motor control buildings.
- *Distribution of groundwater from Seaside Groundwater Basin* – new CalAm distribution system improvements needed to convey extracted groundwater and deliver it to CalAm customers. These same CalAm distribution improvements also would be needed if CalAm were to implement the Monterey Peninsula Water Supply Project, which is undergoing separate CEQA review.

2.6.2 Proposed Project Operations Overview

The Proposed Project would operate with annual and seasonal variations based on the amount of available runoff, the water year type, the varying irrigation demand for recycled water, and the amount of water stored in the Seaside Groundwater Basin as a drought reserve each year.

The primary project objective is to replenish the Seaside Groundwater Basin to produce high quality water to replace CalAm water supply as required by State Orders. The ability of the project to meet the primary project objective of providing CalAm extractions of 3,500 AFY would not depend on water year type (wet, normal, or dry).

The Proposed Project would also increase the amount of recycled water available for crop irrigation within the existing CSIP service area by approximately 4,500 to 4,750 AFY during normal and wet years, and by up to 5,900 AFY during drought conditions. For MRWPCA to secure the necessary rights and agreements to use the source waters needed for the Proposed Project, preliminary negotiations with stakeholders indicate that MRWPCA also would need to increase the amount of recycled water provided to the CSIP area. This amount is within the total permitted capacity of the Salinas Valley Reclamation Plant of 29.6 mgd. Irrigation demands vary seasonally, peaking in the spring and summer months, and also by water year type, increasing in dry and hotter years. Irrigation demand can also change in response to changes in cropping patterns and irrigation practices. The Salinas Valley Reclamation Plant produces tertiary-treated, disinfected water supply (recycled water) from treated municipal wastewater for the CSIP. Peak irrigation demands in the CSIP system exceed the amount of available treated municipal wastewater, so additional water is supplied from the Salinas River and the Salinas Groundwater Basin. The Proposed Project would increase the availability of recycled water during the peak demand periods by providing new sources of water supply to the Salinas Valley Reclamation Plant. The Project also would increase the availability of recycled water for crop irrigation during low demand periods by modifying the Salinas Valley Reclamation Plant to allow production and delivery at lower daily rates, thus further reducing pumping from supplementary groundwater wells.

In addition, to better accommodate variable annual crop irrigation demands for recycled water, an additional 200 AFY would be produced and injected into the Seaside Groundwater Basin during most years to develop a drought reserve of up to 1,000 acre-feet of stored water. This would allow MRWPCA to reduce deliveries of product water to the Seaside Groundwater Basin during drought years, while still enabling CalAm to pump 3,500 AFY from the Seaside Groundwater Basin by using the reserved water. By reducing deliveries of product water to the Seaside Groundwater Basin during drought years, MRWPCA would be able to increase deliveries of recycled water to growers by a commensurate amount.

The Proposed Project's AWT Facility would be designed and constructed to allow production rates from 1.3 mgd (900 gpm) to 4.0 mgd (2,700 gpm). During a wet or normal year, the AWT Facility would operate at an average rate of 3.5 mgd during the summer months (April to September). If the drought reserve is full (1,000 acre-feet additional have been "deposited" in the Seaside Groundwater Basin), the winter production rate would remain 3.5 mgd. If the drought reserve is not full, the winter production rate would be increased to 4.0 mgd to allow the production of an additional 200 AFY. During certain dry years, the AWT Facility production rate would be decreased in the summer months, to rates as low as 1.3 mgd, depending upon the amount of water "deposited" in the drought reserve and the demands of the CSIP irrigators. The Proposed Project would produce enough advanced treated water in each year so that the amount of injected water plus the amount of "withdrawn" drought reserve equals the 3,500 AFY extracted by CalAm. Water supplies not used for the AWT Facility would be used by the Salinas Valley Reclamation Plant to produce additional recycled water for the CSIP.

Table 2-9, Proposed Project Monthly Flows for Various Flow Scenarios summarizes typical flow operations for the AWT Facility based on seasonal flow and demand conditions. Although presented as fixed water year types, actual system operation would require daily or weekly management of the production rates to address the variability in irrigation demands and supply availability. Source water diversions would be similarly managed to maximize water availability during the peak irrigation season, as discussed in **Section 2.7.1**.

Table 2-9
Proposed Project Monthly Flows for Various Flow Scenarios

AWT Facility Influent/Feed

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total (AFY)
Advanced Water Treatment Facility Reverse Osmosis Feed (acre-feet) (See Note 1)													
1. After drought reserve complete	367	331	367	355	367	355	367	367	355	367	355	367	4,321
Extra to build drought reserve	42	38	42	-	-	-	-	-	-	42	41	42	247
2. Wet and Normal Years	409	369	409	355	367	355	367	367	355	409	396	409	4,568
3. Drought Years when Full Drought Reserve	409	369	409	133	137	133	137	137	133	409	396	409	3,211

Purified Recycled Water Delivery

	Product Water Delivery Schedules for Seaside Basin Injection		Acre-Feet per Month (AF/month)												Total	Add to	Reserve as
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	AFY	Reserve	of April 1
1	Drought Reserve <1,000 AF (Oct)	Wet/Normal Year	331	321	331	331	299	331	288	297	288	297	297	288	3,700	200	-
2	Drought Reserve 1,000 AF (Oct)	Wet/Normal Year	297	288	297	297	268	297	288	297	288	297	297	288	3,500	-	-
3	Drought Reserve <1,000 AF (Oct)	Drought Year	331	321	331	331	299	331	255	263	255	263	263	255	3,500	200	200
4	Drought Reserve <1,000 AF (Oct)	Drought Year	331	321	331	331	299	331	222	229	222	229	229	222	3,300	200	400
5	Drought Reserve <1,000 AF (Oct)	Drought Year	331	321	331	331	299	331	189	196	189	196	196	189	3,100	200	600
6	Drought Reserve <1,000 AF (Oct)	Drought Year	331	321	331	331	299	331	156	162	156	162	162	156	2,900	200	800
7	Drought Reserve <1,000 AF (Oct)	Drought Year	331	321	331	331	299	331	124	128	124	128	128	124	2,700	200	1,000
8	Drought Reserve 1,000 AF (Oct)	Drought Year	297	288	297	297	268	297	124	128	124	128	128	124	2,500	-	1,000

Maximum Monthly Injection Rates	Gallons per Minute (gpm)												Maximum Injection Rate
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	(gpm)
Santa Margarita Aquifer (90%)	2,175	2,179	2,175	2,175	2,175	2,175	1,955	1,951	1,955	1,951	1,951	1,955	2,179
Paso Robles Aquifer (10%)	242	242	242	242	242	242	217	217	217	217	217	217	242
Total	2,417	2,422	2,417	2,417	2,417	2,417	2,173	2,168	2,173	2,168	2,168	2,173	2,422

Note 1: These estimated flows exclude the membrane filtration backwash quantities that would be recirculated back to the Regional Treatment Plant headworks and thus would not be considered to be new flows.

Operation of the Proposed Project facilities would require some additional staff at the MRWPCA Regional Treatment Plant and administrative office. The AWT Facility would require up to five personnel to operate the facility 24-hours a day, 7-days a week. The Salinas Valley Reclamation Plant would operate with the same number of staff as currently assigned, but operations would extend into the wet season. The source water diversion and product water conveyance and injection facilities would not require on-site staff, but would require periodic site visits and maintenance activities. These are discussed in detail in the sections below regarding each component.

The Proposed Project would require an estimated 10,952 megawatt-hours per year (mW-hr/yr). Power use for the Crop Irrigation component would peak during drought years when additional recycled water is being produced. Electrical power at the existing MRWPCA facilities comes from solar panels and from generators running on a mix of methane (from the Regional Treatment Plant) and natural gas (from PG&E), with back-up electrical service from PG&E. Additional power would be generated using increased methane from processing of new source water, and increased purchase of natural gas from PG&E. Electrical power for the source water diversion facilities, product water booster pump station, and injection well facilities would be purchased from PG&E.

Table 2-10, Overview of Typical Facility Operations – Proposed Project provides an overview of typical facility operations, truck trips and employees under the Proposed Project. **Table 2-11, Overview of Proposed Project Electricity Demand (all in megawatt-hours per year)** summarizes the power demands of the Proposed Project.

Table 2-10
Overview of Typical Facility Operations – Proposed Project

Proposed Project Component Site	Trucks (per day)	Employees	Employee Trips (per day)	Operations Schedules
Source Water Diversion and Storage Sites				
Salinas Pump Station Diversion	0	0	0	24 hours per day, 365 days per year. No new operations/ maintenance staff expected beyond existing MRWPCA staff.
Salinas Treatment Facility Storage and Recovery	0	0	0	24 hours per day, 365 days per year. No new operations/ maintenance staff expected beyond existing City staff.
Reclamation Ditch and Tembladero Slough Diversions	1	1	2	24 hours per day, 365 days per year. For Reclamation Ditch one trip up to three times per week. For Tembladero no new operations/maintenance staff expected beyond existing MRWPCA staff.
Blanco Drain Diversions (in this case the pump station site)	0	0	0	24 hours per day, 365 days per year. No new operations/ maintenance staff expected beyond existing County and MRWPCA staff.
Lake El Estero Diversion	0	0	0	24 hours per day for urban runoff, wet season (typically November through April) dependent on pipe and pump station capacity and weather. No new operations and maintenance staff expected beyond existing City of Monterey staff.
Treatment Facilities at Regional Treatment Plant				
All new and modified treatment facilities, including AWT Facility, Brine Mixing Facility, Product Water Pump Station and SVRP Modifications	2	5	10	24 hours per day, 365 days per year (10% offline time for maintenance)
Product Water Conveyance				
Pipelines, appurtenant facilities, and Booster Pump Station	1	1	2	24 hours per day, 365 days per year (10% offline time for maintenance)
Injection Well Facilities				
- Injection Wells (4 clusters of 2), each includes a deep injection well, a vadose zone well, and a motor control/electrical building - Monitoring wells (six clusters of 2) - Back-flush water pipeline, product water conveyance pipelines, and electrical conduit under new roadways to each site	0	2	4	24 hours per day, 365 days per year (each well assumed to be inoperable 20% of the year for back-flushing and maintenance)
Total without the CalAm components	**4**	**9**	**18**	
CalAm Distribution of Seaside Groundwater Basin Water via the CalAm System, including the proposed new Monterey and Transfer Pipelines	0	0	4	24 hours per day, 365 days per year
Total with the CalAm components	**4**	**9**	**22**	

Table 2-11
Overview of Proposed Project Electricity Demand (all in megawatt-hours per year)

Source Water Diversion and Storage Sites (Source: Vinod Badani, E2 Consulting, October 2014, except as noted)	
Existing MRWPCA Wastewater Collection System Pump Stations (increased pumping for source water collection) (Source: Bob Holden, MRWPCA, October 2014)	1,100
Proposed Salinas Pump Station Diversions (lighting, SCADA, misc. electricity)	10
Proposed Salinas Industrial Wastewater Treatment Plant Storage and Recovery Component (pumping, lighting, SCADA, misc. electricity)	224
Existing Salinas Treatment Facility and Stormwater Operations (reduction of pumping, Ron Cole, February 2014 modified by MRWPCA staff October 2014)	(1,875)
Proposed Reclamation Ditch Diversion (pumping, lighting, SCADA, misc. electricity)	250
Proposed Tembladero Slough Diversion (pumping, lighting, SCADA, misc. electricity)	461
Proposed Blanco Drain Diversion (pumping, lighting, SCADA, misc. electricity)	731
Proposed Lake El Estero Diversion (lighting, SCADA, misc. electricity)	10
Treatment Facilities at Regional Treatment Plant (Source: Bob Holden, October 2014)	
Existing Primary and Secondary Processes (existing on-site cogeneration facility would provide a reduction in this value, see below) (9,900 AFY more wastewater flows through treatment processes)	3,673
Existing Salinas Valley Reclamation Plant (existing plant operations use solar array electricity, which has reduced electricity demand by up to 1,400 mWhr/yr) (4,260 AFY more crop irrigation water produced)	1,300
AWT Facility (new treatment facilities, not including product water pumping; assumes 3,700 AFY of water production to build drought reserve; demand will be less when Drought Reserve is at full capacity and when Drought Reserve is being used by CSIP)	7,007
CSIP Supplemental Wells (Source: Bob Holden, MRWPCA, October 2014)	
Reduction of use of CSIP Supplemental Wells by 4,260 AFY	(1,900)
Product Water Conveyance (Source: TG Cole, October 2014)	
Pumping of product water to Injection Well Facilities under either option (RUWAP or Coastal)	1,912
Injection Well Facilities (Source: Vinod Badani, E2 Consulting Engineers, October 2014)	
Back-flush of four (4) deep injection wells, lighting, HVAC, meters, instruments, SCADA	147
CalAm Distribution System Changes (Source: CalAm, 2014)	
Increase by moving 3,500 AFY extractions from Carmel River to Seaside Basin wells	630
Proposed New Electricity Generation at Existing Cogeneration Facility	**(2,726)**
TOTAL NET NEW ELECTRICITY DEMAND (in megawatt-hours per year)	10,952

2.7 SOURCE WATER

2.7.1 Overview of Source Water Approach

The preliminary determination of feasibility of the Proposed Project required technical investigations to estimate the regulatory and design requirements, and preliminary capital and operational costs of Proposed Project facilities. One of the key feasibility/planning actions was to assess the ability for the Proposed Project to obtain supplemental source waters to augment existing secondary-treated wastewater flows available to the Project. Water supply sources considered included urban stormwater and dry-weather runoff, surface water diversions from water bodies receiving agricultural tile drainage, and use of industrial wastewater currently treated by the City of Salinas. Additional technical studies were prepared for those sources identified as feasible in the initial studies.

Previous interagency agreements established entitlements to recycled water produced from the existing municipal wastewater flows to the Regional Treatment Plant. As source flows for the Proposed Project were studied and the seasonal variability of each was understood, the stakeholder agencies entered into a Memorandum of Understanding Regarding Source Waters and Water Recycling (MOU) provided in **Appendix B**. The Parties to the MOU are the Monterey Regional Water Pollution Control Agency, the Monterey County Water Resources Agency, the City of Salinas, the Marina Coast Water District, and the Monterey Peninsula Water Management District. The MOU is an agreement to "negotiate a Definitive Agreement to establish contractual rights and obligations of all Parties," that would include (1) protection of Marina Coast Water District's recycled water right entitlement, (2) provision of up to 5,290 AFY of recycled water to Monterey County Water Resources Agency for the CSIP, and (3) provision of 3,500 AFY of purified recycled water for injection into the Seaside Groundwater Basin and extraction by CalAm. The MOU also includes provisions for creation of a drought reserve by allowing the GWR Features to produce, convey and inject up to 200 AFY of additional purified recycled water during wet and normal years. The MOU reflects the stakeholder agencies' positions regarding the combined benefits and conditions that would be required to secure the necessary rights and agreements to use the source waters needed for the Proposed Project.

Based on the preliminary feasibility studies and the MOU, the following sources of water are included for collection and use by the Proposed Project:

- Monterey Peninsula urban stormwater and runoff (in particular, the Proposed Project includes diversion and use of water that currently flows into Lake El Estero and then is pumped by the City of Monterey, or allowed to flow by gravity, through storm drain pipelines to Del Monte Beach);[16]

[16] Projects that propose to capture stormwater flows from other Monterey Peninsula watersheds, including areas of the cities of Pacific Grove and Monterey that flow to the Areas of Special Biological Significance in the Monterey Bay, and divert them to the MRWPCA wastewater collection system are assumed to occur with or without implementation of the Proposed Project. Although other stormwater flows from the Monterey Peninsula are referenced in the MOU for Source Waters and Water Recycling, diversion and use of these flows are assumed to occur independently from the Proposed Project and have independent utility (i.e., to reduce stormwater containing pollutants from flowing into the portion of the ocean that is an Area of Special Biological Significance) and thus the implementation and assessment of impacts of other stormwater diversion project(s) are included as

- City of Salinas urban stormwater and runoff from the southwest portion of the city that is currently discharged into the Salinas River near Davis Road via a 66-inch outfall line;
- Salinas agricultural wash water, 80 to 90% of which is water used for washing produce, that is currently conveyed to the Salinas Treatment Facility for treatment (aeration) and disposal by evaporation and percolation;
- Urban and agricultural runoff and tile drainage water from the Reclamation Ditch and Tembladero Slough (to which the Reclamation Ditch is tributary);[17]
- Water from the Blanco Drain, a man-made reclamation ditch that collects drainage from approximately 6,400 acres of agricultural lands near Salinas;[18]
- Municipal wastewater from MRWPCA member agencies that is treated with existing primary and secondary processes at the Regional Treatment Plant and would otherwise be discharged to the Pacific Ocean (i.e., not treated to a tertiary level for agricultural irrigation).

To maximize the ability to use these sources, two existing facilities would be modified:

- Modifications to the existing Salinas Valley Reclamation Plant to enable the plant to run at less than 5 mgd, and
- Addition of a pipeline and pump station at the Salinas Treatment Facility and slip-lining of an existing 33-inch industrial wastewater pipeline between TP1 and the Salinas Treatment Facility to allow storage and recovery of winter agricultural wash water and south Salinas stormwater.

This combination of source waters and modifications to existing treatment facilities would be capable of achieving the project objectives at a reasonable cost. In particular, the proposed source waters except Blanco Drain diversions would use existing infrastructure facilities with available capacity for conveyance purposes, thus minimizing capital costs and environmental impacts.

2.7.1.1 Summary of Source Water Flow Availability for Proposed Project

Table 2-12, Source Waters Flows: Existing and Assumed Available for Proposed Project (in AFY) summarizes the results of the Water Management District and MRWPCA's analysis of the data and assumptions used to estimate source water availability and use. These estimates have been used to identify the range of flows affecting design of the Proposed Project facilities. **Appendices B** and **C** include the assumptions regarding source water availability, including estimates by month to develop the range of potential flows for

cumulative project(s) (see **Section 4.1, Environmental Setting, Impacts, and Mitigation Measures,** of this Draft EIR).

[17] The amount of water has been estimated based on assuming water available for diversion for the Proposed Project would be in excess of required fish passage flows and under the flow rate that can be conveyed to the Regional Treatment Plan using the existing municipal wastewater collection system.

[18] The Blanco Drain is the only source of supply not located near an existing wastewater collection facility which could be used to convey flows to the Regional Treatment Plant. Development of this source would require not only a new pump station, but also a pipeline crossing the Salinas River. The pipeline may extend to the Regional Treatment Plant headworks or may connect to the gravity portion of the Salinas interceptor (to be determined during detailed design).

use in designing Proposed Project facilities (for Advanced Water Treatment Facility, Product Water Conveyance, and Injection Well Facilities) to meet the primary Proposed Project goal of delivering purified recycled water to the Seaside Groundwater Basin, as well as the secondary Project goals of increasing crop irrigation water for growers in the CSIP area and establishing a drought reserve of up to 1,000 AF (Schaaf & Wheeler, 2015c).

Table 2-12
Source Waters Flows: Existing and Assumed Available for Proposed Project (in AFY)

Type of Source Water:	Definitions of "Existing" Flows (in AFY)							Projected future flows in 2017 (AFY)	Proposed Project Maximum Use of Source Water Flows, (AFY) (Note 2)
	2012 (actual)	2013 (actual)	Historical Average Flows (averaging period)						
			2012-13 *(2-yr average)*	2009-13 *(5-yr average)*	2007-13 *(7-yr average)*	2004-13 *(10-yr average)*	All data (see below)		
Excess/Unused Regional Treatment Plant Municipal Effluent (MRWPCA, Regional Treatment Plant flow monitoring data, January 2014)	9,714	4,621	7,183	8,225	8,704	9,457	10,300 (1999-2013)	6,242 (Note 1)	3,000 to more than 5,000
Agricultural Wash Water Flows (Source: City of Salinas and MRWPCA, 2014)	3,058	3,228	3,143	2,676	2,579	NA (Note 3)	2,579 (2007-13)	3,732 (Note 1)	2,579
City of Salinas Urban Runoff to Salinas River (Source: Schaaf & Wheeler, 2015a)	229	19	124	196	165	176	225 (1932-2013)	225	
Reclamation Ditch at Davis Road (Source: Schaaf & Wheeler, 2015b)	6,759	1,965	4,362	7,034	6,374	7,482	7,159 (2003-13)	7,159	1,522
Tembladero Slough at Castroville (Source: Schaaf & Wheeler, 2015b)	9,190	2,610	5,900	9,536	8,531	10,030	9,593 (2003-13)	9,593	1,135
Blanco Drain Diversions (Source: Schaaf & Wheeler, 2014b)	NA (Note 5)	NA (Note 5)	NA (Note 5)	NA	NA	NA	2,620 (2010-12)	2,620 (Note 5)	2,620
Lake El Estero Storage Management Water (Source: Schaaf & Wheeler, 2014a)	65	0	33	66	55	60	87 (1952-2013)	87	87
TOTALS (Note 6)	**22,256**	**10,478**	**16,383**	**21,557**	**20,034**	**NA (Note 4)**	**25,404**	**NA**	**9,311 (Note 6)**

Notes:
1. Projection of flows available in first year of Proposed Project operation 2017 (See **Appendix B**).
2. Source: Schaaf & Wheeler/Monterey Peninsula Water Management District, 2015 (see **Appendix B**).
3. Flows not available for years prior to 2007.
4. Due to lack of data regarding agricultural wash water prior to 2007 and recent trends, these numbers could not be summed to provide a total of source water flows for this averaging period.
5. Blanco Drain flows calculated based on seasonal pumping records (April to November)
6. The total use of source water would be less than the sum of all source waters due to seasonal nature of the demands and losses due to Salinas Treatment Facility Storage and Recovery. The analysis assumes that new source water that exceeds the amount used by the Proposed Project for recycling would be disposed via the MRWPCA existing ocean outfall. The amount of effluent to be disposed to the MRWPCA ocean outfall would be less with Proposed Project than current conditions as shown in **Appendix B**.

NA = Not available.

2.7.1.2 Source Water Operation: Diversion, Treatment and Use

The availability of some of the sources of water supplies for the Proposed Project would vary inversely with the Project's water demands. The sources of supply that capture rainfall (urban runoff and surface water diversions within urban areas in their watershed) peak during periods of low irrigation demands, and have minimal or no available flows during periods of peak irrigation demands. By contrast, two sources of supply, agricultural wash water and secondary treated municipal wastewater, have some seasonal variability but are available year-round.

To address the seasonality of supplies and demands, the use of source water would be prioritized by source, and in some cases managed by season. **Table 2-13, Source Water Use Scenarios, including Priority, Seasonality, and Use by Project Phase and Drought Reserve Status** lists proposed sources by priority of use wherein excess unused wastewater is assumed to be used first as the most efficient source water to collect, convey, and treat. Detailed use scenarios are provided in **Appendix B** to demonstrate some potential operational scenarios that may be used in various water year types to optimize the Proposed Project by prioritizing source waters for energy efficiency and reduction of ocean discharges (Schaaf & Wheeler, 2015c).

Treated municipal wastewater currently is used to produce recycled water at the Salinas Valley Reclamation Plant for crop irrigation. Recycled water users under previous agreements have the first right to this supply. Under the Proposed Project, at times when unused treated municipal wastewater is not needed for crop irrigation, and instead would otherwise be discharged through the ocean outfall, it would become the first priority source of supply for the AWT Facility, with a goal of minimizing the amount of flow discharged to the ocean and energy use by the Proposed Project.

Agricultural wash water, which is currently treated at the Salinas Treatment Facility, is available year-round and is the most reliable source of new water supply for the Project. It would be diverted to the Regional Treatment Plant during peak irrigation time periods and managed to meet the peak summer demand season by storing winter flows in the existing ponds at the Salinas Treatment Facility. In the summer months, both the incoming agricultural wash water and the stored stormwater would be directed to the Regional Treatment Plant, allowing production of advanced treated water for groundwater injection and increased recycled water production for CSIP.

Urban stormwater runoff may be diverted to the sanitary sewer collection system for minimal cost and without a water rights permit, and is therefore the next priority source of supply for the Proposed Project. However, when this supply is most available, irrigation demands are low and secondary-treated municipal wastewater would typically be available in adequate quantities to meet project objectives. If that is the case, urban runoff at Lake El Estero may not be diverted, and urban runoff from the City of Salinas would not be routed to the Salinas Treatment Facility for seasonal storage. Runoff from summer storms would be diverted when available.

Table 2-13
Source Water Use Scenarios, including Priority, Seasonality, and Use by Project Phase and Drought Reserve Status

Priority	Source	Seasonal Availability	Usage Period	Projected Use Scenarios by Type of Operational Year (AFY)		
				While Building Drought Reserve	Drought Reserve is Full at 1,000 AFY	During Years when CSIP Uses Drought Reserve
1	Unused Treated Municipal Wastewater	October through March	When available	1,992	1,787	1,503
2	Agricultural Wash Water (See Note 1)	Year-round	Store at Salinas Treatment Facility for summer	2,579	2,579	2,362
3	Salinas Urban Stormwater Runoff (See Note 1)	October through April				
4	Reclamation Ditch at Davis Road	Year-round, higher in October through April	When available	721	721	1,071
5	Blanco Drain Pump Station	Year-round, higher in April through September	When available	1,268	1,020	2,003
6	Tembladero Slough At Castroville	Year-round, higher in October through April	When available	0	0	478
7	Monterey Stormwater at Lake El Estero (See Note 2)	October through April	When available	0	0	0

Notes:
1. The amount of Agricultural Wash Water and Salinas Urban Stormwater Runoff source water use shown in this table are combined because they will be mixed, stored, and diverted to the Regional Treatment Plant together. The ability of the Proposed Project to recycle the full amount available (shown in Table 2-12) would be reduced due to the storage and recovery of these waters at the Salinas Treatment Facility and the associated percolation and evaporation during storage. The storage and recovery component does, however, shift the availability of the supplies to the dry season when there is a greater demand for irrigation water within the CSIP area.
2. Wet season supply from Lake El Estero is not required in these typical scenarios shown; however, there may be conditions during which diversions may occur.
See **Appendix B** for detailed monthly source water use projections based on water year type, drought reserve status, and project phase.

Water rights permits from the SWRCB would be required for surface water diversions from the Blanco Drain, Reclamation Ditch, and Tembladero Slough. Pursuant to the provisions of the MOU Regarding Source Waters and Water Recycling, the MRWPCA and the Water Management District would work with the Monterey County Water Resources Agency to secure water rights needed for the Proposed Project. The County Water Resources Agency has filed SWRCB application 32263 to secure rights to use the water within these water bodies. The Proposed Project would not need all of the water in Blanco Drain, Reclamation Ditch and Tembladero Slough. A maximum expected diversion flow has been developed for the Proposed Project based on an assessment of infrastructure capacity and peak flow availabilities in those water bodies. Flows in these channels are less seasonal than urban runoff, but still peak in the winter months during rain events. These sources would be diverted when flows are available and when the other sources of supply are not sufficient to meet the full Project demands. Radio-controlled supervisory control and data acquisition (SCADA) equipment at each diversion pump station would allow the system operators to adjust the diversion rates in response to daily rainfall and irrigation conditions.

Based on the maximum expected diversion flows developed for the Proposed Project, the following water rights would be needed for the Proposed Project:

1) diversion from the Reclamation Ditch at Davis Road of up to 2,000 AFY with a 6 cfs maximum diversion rate;
2) diversion from Tembladero Slough at the Castroville pump station of up to 1,500 AFY with a 3 cubic foot per second (cfs) maximum diversion rate; and
3) diversion from the Blanco Drain of up to 3,000 AFY with a 6 cfs maximum diversion rate.

The place of use in each of these applications would be for storage in the Seaside Basin and use within the CSIP area and CalAm's Monterey District system. The 6 cfs quantity was determined to be the peak water flows that could be diverted from the Reclamation Ditch at Davis Road (Schaaf & Wheeler, 2015b) and the peak amount of flow available in the Blanco Drain for diversion in new infrastructure (Schaaf & Wheeler, 2015b). Currently, the wastewater collection and conveyance infrastructure between Castroville and the Regional Treatment Plant can only feasibly accommodate flows of up to 3 cfs and thus limits the amount of water that would be diverted in Castroville from the Tembladero Slough. It should be noted that the annual diversion amounts are considered "face amounts" that cannot be exceeded in any single year. These amounts do not reflect the Proposed Project use on an average basis. In addition, the Proposed Project description of yield and the assumed diversions for the impact analyses (i.e., biological resources and surface water hydrology) assumes some water would be left in the Reclamation Ditch and Tembladero Slough for fisheries resources. Specifically, flows of 0.69 cfs and 2.0 cfs are proposed to be left in the Reclamation Ditch at Davis Road from June through November and December through May, respectively. A minimum flow of 1 cfs is proposed to remain in the Tembladero Slough year round; however much more than that is anticipated to be present even under Proposed Project divresions. See **Section 4.4, Biological Resources: Fisheries,** for more discussion of fisheries issues.

The Monterey County Water Resources Agency may pursue an additional application for the remainder amounts. The remainder application for additional diversions above amounts in the Proposed Project would be the responsibility of Monterey County Water Resources Agency to take forward as a separate project and is not part of the Proposed Project nor are the impacts of those diversions evaluated in this EIR. The application amounts for a remainder permit could be up to 85 cfs in direct diversions and a remainder diversion amount of up to 18,500 AFY that would bring the combined annual diversion amount for all permits up to a limit of 25,000 AFY.

2.7.2 Source Water Types and Diversion Methods

2.7.2.1 Quantity Needed for Injection into the Seaside Basin

The Proposed Project would produce 3,500 AFY of high quality water for injection into the Seaside Groundwater Basin for use by CalAm. In addition, in normal or wet years when the drought reserve is being filled, the Proposed Project would produce an additional 200 AFY for storage in the Seaside Groundwater Basin. The Proposed Project would require more source water than the amount of water to be produced due to the loss of water (reject) from operation of the reverse osmosis system at the Advanced Water Treatment Facility, which is estimated to operate at an 81% product water recovery rate. In this case, to produce 3,700 AFY of treated water, a total of 868 AFY (19% of the AWT Facility influent) of concentrated reject water from the reverse osmosis system would be disposed through the ocean outfall. To produce 3,700 AFY of treated water, the Proposed Project would require a minimum of approximately 4,568

AFY of raw source waters to feed the proposed new AWT Facility in wet and normal years (assumed five years out of six).

2.7.2.2 Quantity for Crop Irrigation

During wet and normal years, approximately 4,500 to 4,750 AFY of additional source water is proposed to be collected to augment recycled water supplies for crop irrigation by distribution through the CSIP. This quantity is within the approved capacity of the Salinas Valley Reclamation Plant of 29.6 mgd. The total maximum amount of recycled water that would be treated and made available to the existing CSIP areas under the Proposed Project would be less than 29.6 mgd which represents:

- The monthly average dry weather flow capacity of the Regional Treatment Plant pursuant to the permits for the plant; and
- The daily design capacity and annual expected maximum “basic demand” of the Salinas Valley Reclamation Plant described on pages 5 and 7, respectively, of the Agreement between the MCWRA and the MRWPCA for Construction and Operation of a Tertiary Treatment System (June 16, 1992).

During drought conditions, when dry season crop irrigation demands within the CSIP area cannot be met by other non-groundwater sources, the Proposed Project would reduce its production for injection into the Seaside Groundwater Basin to as little as 2,600 AFY, allowing the growers served by the Salinas Valley Reclamation Plant and CSIP to use up to 1,000 acre feet more of the available source water (up to as much as 5,900 AFY). The actual dry year AWT Facility production for injection to the Seaside Basin would depend upon the amount of drought reserve water previously injected, so that the CalAm Water supply extraction of GWR water (including production plus the previous reserve “deposits”) would continue to total 3,500 AFY in every year. The results and assumptions of this analysis are contained in **Appendix B**. Descriptions of the source waters discussed above are summarized in the following descriptions.

2.7.2.3 Unused Treated Wastewater from MRWPCA Regional Treatment Plant

Description and Estimated Yield

Secondary effluent from the Regional Treatment Plant currently is used as influent for the tertiary treatment plant that is referred to as the Salinas Valley Reclamation Plant, which supplies tertiary treated recycled water for agricultural irrigation use via the distribution system that comprises the CSIP. To determine how much and when to treat the secondary effluent to a tertiary level outside of the growing season, the growers submit water orders one to three days before water is needed. This prevents MRWPCA from creating excess tertiary-treated water that would remain too long in the tertiary storage pond creating too much algae to be used by the growers. During the growing season, MRWPCA treats as much recycled water as possible. If the storage pond fills, then MRWPCA slows down or stops creation of recycled water. If the pond water level descends to a specific elevation, Salinas River water stored behind the Salinas River Diversion Facility is pumped, screened, disinfected, and mixed into the pond.

Secondary effluent in excess of the CSIP demands is not sent to the tertiary treatment plant, and instead is discharged to the Monterey Bay through MRWPCA’s existing ocean outfall. Under the Proposed Project, effluent that otherwise would be discharged through the ocean outfall would instead be sent to the AWT Facility and treated for injection into the Seaside

Groundwater Basin. In addition, some of the secondary effluent that otherwise would be sent to the ocean outfall during winter months would be used to produce additional recycled water for crop irrigation during low demand periods. The Salinas Valley Reclamation Plant was designed for a minimum daily flow of 8.0 mgd. Facility modifications within the plant would be implemented to lower the minimum daily flow. See **Section 2.8.2** for a description of those improvements.

No new off-site conveyance facilities would need to be constructed to use water from this source.[19] Therefore, use of this source is preferred over other potential new sources.

The quantity of excess secondary effluent that otherwise would be discharged to the ocean outfall each year is highly variable, because the CSIP demands are both weather-dependent, peaking in dry years, and crop dependent, varying by what is planted. Ocean outflows have ranged from 4,600 AFY (water year 2013, record low rainfall) to 12,100 AFY (water year 2006, above average rainfall with a particularly wet spring). Average unused secondary effluent flows are estimated to total 6,242 AFY in 2017 (the anticipated year that the GWR Features would commence operations). Depending upon the water year type and the drought reserve status, the Proposed Project may use from 3,000 AFY to 4,800 AFY from this source, predominantly in the winter months. The methodology for estimating these available flows is found in **Appendix B** of this EIR.

Diversion Method and Facilities

As described above, municipal wastewater is conveyed to the Regional Treatment Plant through existing infrastructure, and undergoes primary and secondary wastewater treatment before being either supplied to the Salinas Valley Reclamation Plant for tertiary treatment or discharged through the ocean outfall. To use this treated wastewater, the Proposed Project would include construction of a new diversion structure on the existing secondary effluent pipeline to capture unused secondary-treated effluent. This facility is described as part of the Treatment Facilities at the Regional Treatment Plant in **Section 2.8.1.**

Construction

Construction of the secondary-treated effluent diversion structure and pipeline is discussed as part of the Treatment Facilities at the Regional Treatment Plant in **Section 2.8.1.**

Operations and Maintenance

Operation of the secondary-treated effluent diversion is discussed as part of the Treatment Facilities at the Regional Treatment Plant in **Section 2.8.1.**

2.7.2.4 Agricultural Wash Water

Description and Estimated Yield

Salinas agricultural wash water, 80 to 90% of which is water used for washing produce, is currently conveyed to the Salinas Treatment Facility for treatment (aeration) and disposal by evaporation and percolation.

[19] Use of wastewater from member agencies would not require construction of new source water delivery infrastructure.

To use water from this source for the Proposed Project, this water would be diverted to the existing Salinas Pump Station using a new diversion structure and new short pipelines connecting the existing agricultural wash water pipeline to the existing municipal wastewater system just prior to the Salinas Pump Station. The agricultural wash water would then mix with the municipal wastewater and be conveyed through the existing 36-inch diameter Salinas interceptor to the Regional Treatment Plant. A temporary connection was installed in April 2014, diverting all agricultural wash water to the Regional Treatment Plant to augment the Salinas Valley Reclamation Plant production of recycled water during the current drought, to provide data regarding treatability of the agricultural wash water (with and without municipal wastewater) using the demonstration facility, and to allow the City of Salinas to perform maintenance on the Salinas Treatment Facility. The new physical facilities proposed to be constructed to divert this source water are described below.

Agricultural wash water influent to the Salinas Treatment Facility totaled 3,228 AF in 2013, and is projected to total 3,733 AF in 2017 (the anticipated year that GWR Features would commence operations) based on data showing that agricultural processing wastewater flows have increased by about 0.25 mgd each year since 2010. The feasibility analysis for the Proposed Project did not assume any continued increases in this source beyond 2017, although development of new or expanded facilities may continue to occur pursuant to the Salinas Agricultural Industrial Center Specific Plan, contributing additional wastewater flows to the Salinas industrial wastewater collection system beyond that year.

Agricultural wash water would be available year-round, with peak flows occurring during the summer harvest season. To maximize the use of all available sources, agricultural wash water would only be diverted directly to the Regional Treatment Plant during the peak irrigation demand months (typically April through October). From November through March, agricultural wash water flows would be sent to the Salinas Treatment Facility for treatment and stored in the existing ponds, which can hold approximately 1,250 acre-feet. From May to October, the incoming flows would be diverted to the Salinas Pump Station, and stored water would be pumped from the Salinas Treatment Facility ponds back to the Salinas Pump Station. Taking into consideration evaporative losses, seepage losses and recovery of stored water, the Salinas Treatment Facility ponds would be empty by the end of each irrigation season. The net yield after accounting for storage losses would be approximately 2,710 AFY. The following section describes the facility modifications that would be needed to achieve this yield.

Diversion Method and Facilities

Salinas Pump Station Diversion Structure and Pipelines

Two of the proposed sources of raw water for the Proposed Project would be captured and diverted from subsurface conveyance structures to the existing MRWPCA Salinas Pump Station: agricultural wash water and City of Salinas urban runoff (described in **Section 2.7.2.3**). Both of these sources would necessitate construction of new diversion structures and short pipelines near the existing Salinas Pump Station, as shown in **Figure 2-21, Salinas Pump Station Source Water Diversion Conceptual Site Plan**. The Salinas Pump Station Diversion site (also referred to as Treatment Plant 1, or TP1) would include several new diversion facilities to redirect flows of agricultural wash water and City of Salinas stormwater and dry weather runoff to the existing Salinas Pump Station for blending with Salinas municipal wastewater and treatment and recycling at the Regional Treatment Plant. The combined storm and waste waters would be conveyed from the existing Salinas Pump Station through the MRWPCA's existing 36-inch diameter interceptor to the Regional Treatment Plant. The diversion facility would also accommodate the routing of agricultural wash water and winter stormwater to the Salinas Treatment Facility for seasonal storage, and would provide a termination point for the pipeline that would carry returned flows of stored waters to the Salinas Pump Station. Key existing and proposed facilities at this site are shown in **Figure 2-21, Salinas Pump Station Source Water Diversion Conceptual Site Plan**. Generally, these facilities include the following:[20]

- A new underground junction structure to be constructed over the existing 48-inch sanitary sewer line, to mix sanitary, agricultural wash water and stormwater flows. This structure would also receive agricultural wash water and stormwater return flow from the Salinas Treatment Facility's Pond 3.
- Modifications to the existing agricultural wash water underground diversion structure, and addition of approximately 150-foot long 42-inch diameter underground pipeline and metering structure between this structure and the new junction structure to be constructed over the existing 48-inch sanitary sewer line.
- An underground stormwater diversion structure (Stormwater Diversion Structure No. 1) and underground pipeline between this new structure and the existing 33-inch agricultural wash water line.
- An underground stormwater diversion structure (Stormwater Diversion Structure No. 2) near the existing stormwater pump station and underground pipeline to divert stormwater flow to the Salinas Pump Station through an existing 30-inch abandoned pipeline.
- Meters, valves, electrical and control systems, and fencing around the diversion structures.

Salinas Treatment Facility Pond Storage and Recovery

The City of Salinas is constructing a new 42-inch industrial wastewater pipeline to replace the existing 33-inch gravity main between the City's TP1 site (the site on which the Salinas Pump Station is located) and the Salinas Treatment Facility. Winter flows of agricultural wash water and Salinas urban stormwater runoff would be conveyed to the ponds using the new 42-inch pipeline. Water within the Salinas Treatment Facility currently moves as gravity overflows from the aeration basin to Pond 1, then Pond 2 and finally, Pond 3.

[20] As of October 2014, the City's planned new 42-inch industrial wastewater pipeline is under construction. In addition, a separately proposed sanitary sewer overflow structure and pipeline is planned to be built prior to the release of the Draft EIR, independent from the Proposed Project; therefore, these facilities are shown as "planned" on **Figure 2-22, Proposed Salinas Treatment Facility Storage and Recovery Conceptual Site Plan.**

Seasonal storage of agricultural wash water and Salinas urban stormwater runoff at the Salinas Treatment Facility ponds would require construction of a new return pipeline and pump station to return the stored water to the Salinas Pump Station Diversion site. The proposed return pipeline would be an 18-inch pipeline, installed inside the existing, soon to be abandoned 33-inch pipeline. A new return pump station, and a new valve and meter vault would be located within the existing Salinas Treatment Facility site near the existing pump station. The new return pump station would include two variable frequency drive pumps, a primary and a secondary. A new pipeline would be constructed from the lower end of the Pond 3 to the new return pump station. A second new pump station near the lower end of Pond 3 would be needed to lift stored agricultural wash water and stormwater into a pipeline returning to the return pump station. A new short pipeline would also be constructed to convey the treated wastewater from the aeration basin to the pipeline that returns water from Pond 3 or directly to the return pump station. The proposed new pipelines and pumps are shown in **Figure 2-22, Proposed Salinas Treatment Facility Storage and Recovery Conceptual Site Plan**

Construction

Salinas Pump Station Diversion Site

Construction activities at this site would include demolition, excavation, site grading and installation of new junction structures, new meter vault or flow measurement structures and short pipeline segments. Existing pump stations operations would be ongoing during construction due to the uninterruptible nature of conveyance of wastewater (and in some cases, stormwater flows). For this reason, temporary shunts of various waters may be necessary to maintain the collection and conveyance of waters to treatment facilities. Construction may occur up to 24 hours per day, 7 days per week due to the necessity of managing wastewater flows; however, major construction of new facilities would be limited to daytime hours. Approximately 0.75 acres would be temporarily disturbed and up to 0.25 acres of new impervious surfaces would be added to the site. The permanent facilities would be subsurface. The site would be under construction for up to five months.

Salinas Treatment Facility Storage and Recovery

The majority of the construction activity for the Salinas Treatment Facility Storage and Recovery Facilities would occur within the existing 281-acre Salinas Treatment Facility site. New pipelines from Pond 3 and the aeration basin to the return pump station, including precast concrete manholes, would be constructed within the existing unpaved access road and parallel to the existing pipelines. A new lift station would be constructed at Pond 3 to return water to the return pump station. This new lift station would be constructed adjacent to the existing City of Salinas irrigation transfer station in Pond 3. If the work for the new lift station in Pond 3 must be performed while it is full, sheet piling and dewatering equipment will be required. The return pump station would be located near the existing influent pump station at the east end of the site. Return pump station and pipelines construction would include trenching and installation of new pipelines, new pump and lift station, new pumps/pump motors, electrical facilities, valve vaults and flow meter, requiring equipment delivery trucks, loaders, compactors, and backhoes.

The recovery or return pipeline from the Salinas Treatment Facility to the Salinas Pump Station Diversion site would be constructed inside the existing 33-inch influent pipeline, which is scheduled to be abandoned in place in late 2015 after a new 42-inch pipeline is completed. Installing a new pipeline inside the existing pipeline would require excavating access pits every 600-ft to 800-ft along the existing alignment, cutting into the existing pipe, pulling the new assembled pipe into the existing pipe and connecting the new pipe segments before closing the pit. The work area at each pit would be up to 20-ft wide, approximately 60-ft long and up to 10-feet deep. Equipment would include equipment delivery trucks, loaders, backhoes, pipe cutting and welding equipment, pipeline fusing equipment (if fusible pipe is used), and pipeline pulling equipment. If work must occur in an existing street, paving equipment would be required for repairing the site.

Operations and Maintenance

The Salinas Pump Station Diversion site is adjacent to and north of the existing Salinas Pump Station within the City's Treatment Plant 1 site (also called, TP1), and would be maintained by the same MRWPCA operations staff as currently operate the pump station. No additional employee site visits would be required at the Salinas Pump Station site. The facility would operate continually using automated flow metering, gates and valves. Operations would consist of seasonally adjusting the diversion settings to direct flows to the Pump Station or to the Salinas Treatment Facility. Gates and valves would be exercised annually if not operated more frequently. Installed flow meters would require periodic inspection and calibration on a less-than-annual frequency. Power usage at the site would be incidental to the existing pump station and would only be needed for SCADA and metering and controls for the gates and valves. No ongoing materials delivery or solid waste generation would occur.

Similarly, the new storage and recovery facilities at the Salinas Treatment Facility would be managed by the same number of staff that currently operates the Salinas Treatment Facility. During the storage season (November to April), the return pumps would not be operated. The Salinas Treatment Facility aeration pond would continue to operate as it currently does. Volumes in Ponds 1, 2, and 3 would be monitored. If inflows exceed the storage capacity, some flows would be diverted to the existing drying beds, or adjustments may be made at the Salinas Pump Station Diversion to send some agricultural wash water to the Regional Treatment Plant. The return pumps at the Salinas Treatment Facility and the Pond 3 lift station would be inspected during the storage season, and routine mechanical services would be scheduled during this season. Trucks with lifting equipment would be required to pull the pumps out of the wet wells for maintenance.

During the return pumping season (June to October), the return pump station would operate during the period of off-peak electrical rates, at flow rates up to 5 mgd, depending upon the daily volume of new agricultural wash water diverted directly to the Salinas Pump Station. The pumping rate may be reduced during the peak hours of agricultural wash water flows. Stored water in Pond 3 (the westernmost pond at the Salinas Treatment Facility) would be conveyed to the return pump station using a new lift state and gravity pipeline. At the end of this season, the Salinas Treatment Facility ponds would be empty or nearly empty, allowing maintenance to be performed, if needed, on the gates, valves, overflow structures, pump stations and levee banks.

2.7.2.5 City of Salinas Urban Runoff to Salinas River

Description and Estimated Yield

City of Salinas urban runoff and stormwater from the southwest portion of the city is currently discharged into the Salinas River near Davis Road via a 66-inch outfall line. Rain events may occur year-round, but the majority of the flows occur between November and April.

Under the Proposed Project, City of Salinas urban runoff and stormwater would be diverted to the Regional Treatment Plant rather than discharged to the Salinas River. This source is estimated to yield an average raw water supply of 225 AFY, based upon estimated daily runoff from the contributing portions of the city and available capacity at the Salinas Pump Station (see **Table 2-14, Estimated Urban Runoff Available for Capture from the City of Salinas to Salinas River (in AF)**). The memorandum describing the methodology for calculating flows available for, and capable of, diversion to the Regional Treatment Plant is found in **Appendix O** (Schaaf & Wheeler, 2015a).

Table 2-14
Estimated Urban Runoff Available for Capture from the City of Salinas to Salinas River (in AF)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Average	8	23	47	52	41	34	16	2	0	0	0	2	225

To use water from this source for the Proposed Project, stormwater would be diverted by gravity from the existing city stormwater pipelines to the existing MRWPCA Salinas Pump Station using one or two new diversion structure(s). It would also be diverted into the Industrial Wastewater System for storage at the Salinas Treatment Facility ponds and returned to the Salinas Pump Station for conveyance to the Regional Treatment Plant for recycling and summer use (as discussed under Agricultural Wash Water).

Consistent with existing conditions, excess stormwater during large rain events, which exceeds the available Salinas Pump Station capacity or the conveyance capacity to the Salinas Treatment Facility, would be discharged to the Salinas River through the existing stormwater infrastructure. In extreme storm events, stormwater also could continue to overflow to the Blanco Detention Basin, an existing earthen depression adjacent to the Salinas Pump Station that currently captures excess stormwater runoff that cannot be conveyed to the storm drain pipeline that discharges to the Salinas River.

Diversion Method and Facilities

The Salinas Pump Station Diversion structures and pipelines that are described in **Section 2.7.2.2** would also be used to divert Salinas urban runoff to the Regional Treatment Plant for recycling for crop irrigation demands and use by the AWT Facility.

Construction

Construction of the Salinas Pump Station urban runoff diversion structure is discussed as part of the Agricultural Wash Water facility construction in **Section 2.7.2.2.**

Operations and Maintenance

Operation of the Salinas Pump Station diversion structures is discussed as part of the Agricultural Wash Water facility operation in **Section 2.7.2.2.**

2.7.2.6 Reclamation Ditch / Tembladero Slough

Description and Estimated Yield

Two source water diversions from the Reclamation Ditch system are proposed as sources of supply for the Proposed Project, requiring water rights permits for diversion and use, which would be pursued through an amendment to a previously-submitted water right application.[21]

The first diversion point would be located on the Reclamation Ditch at Davis Road, where an existing 54-inch City of Salinas sanitary sewer main crosses the Reclamation Ditch. A new diversion structure would be installed in the ditch, and a new pump station, valve and meter vaults would be installed on the southern bank, to divert flows, when available, into the existing 54-inch sanitary sewer main, which conveys wastewater to the MRWPCA Salinas Pump Station. Based on the available conveyance capacity in the gravity sewer system between the point of diversion and the Salinas Pump Station and the historic flows in the Reclamation Ditch, diversions of up to 6 cubic feet per second (cfs) were estimated, assuming an in-stream (by-pass) flow requirement of 0.69 cfs in the months of June to November, and 2.0 cfs during the months of December to May for fish migration. This source would yield an average 1,522 AFY for a 6 cfs water right permit. Monthly yields are presented in **Table 2-15, Estimated Average-Year Diversion from the Reclamation Ditch at Davis Road (acre-feet)**.

Table 2-15
Estimated Average-Year Diversion from the Reclamation Ditch at Davis Road (acre-feet)

Maximum Rate	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
6 cfs	162	143	165	162	97	132	129	121	80	87	98	146	**1,522**

Note: Assumes 0.69 cfs remains in-stream from Jun-Nov, and 2.0 cfs remains in-stream Dec-May

The other diversion point would be located on Tembladero Slough just west of Highway 1, at the MRWPCA Castroville Pump Station. A new diversion structure would be installed in the Tembladero Slough, and a small pump station would be installed on the northern bank, to divert flows, when available, to the existing pump station that feeds the existing MRWPCA Castroville interceptor pipeline. Based on the existing conveyance capacity within the MRWPCA system and the historic flows, diversions up to 3 cfs were estimated, assuming an in-stream (by-pass) flow requirement of 1.0 cfs year-round. This portion of the Reclamation Ditch system is tidally influenced, so the lower bypass flow rate would be needed to maintain the required depth of water in the channel. This source would yield an average of 1,135 AFY as shown in **Table 2-16, Estimated Average-Year Diversion from the Tembladero Slough at Castroville (acre-feet)**.

[21] SWRCB Permit Application No. A032263, filed by Monterey County Water Resources Agency.

Table 2-16
Estimated Average-Year Diversion from the Tembladero Slough at Castroville (acre-feet)

Maximum Rate	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
3 cfs	131	117	142	154	145	67	66	62	41	45	50	115	**1,135**

Note: Assumes 1.0 cfs remains in-stream and 6.0 cfs is diverted at Davis Road

Based on the availability of other supply sources for the Proposed Project, diversions from these sources may be reduced during the winter months. The proposed diversion facilities would be equipped with supervisory control and data acquisition (SCADA) equipment which allows the diversions to be turned off remotely. If excess treated municipal wastewater is available at the Regional Treatment Plant, these diversions would be shut off rather than diverting surface water while simultaneously discharging treated wastewater to the ocean outfall. The methodology used for estimating available flows is found in **Appendix P** (Schaaf & Wheeler, 2015b).

Diversion Method and Facilities

Reclamation Ditch Diversion Pump Station at Davis Road

The Reclamation Ditch Diversion would consist of a new intake structure on the channel bottom, connecting to a new wet well (manhole) on the channel bank via a new gravity pipeline. The new intake would be screened to prevent fish and trash from entering the pump station. Two submersible pumps would be installed in the wet well, controlled by variable frequency drives. The electrical controls and drives would be in a locked, weatherproof cabinet near the wet well and above flood level. The new pump station would discharge through two new short force mains (approximately 50-ft each), discharging to an existing manhole on the City of Salinas 54-inch sanitary sewer main. Two new underground vaults would be installed along the force main, one to hold the check and isolation valves, and one for the flow meter. The channel banks and invert near the pump station intake would be lined with concrete to prevent scouring and facilitate the management of by-pass flows. Key existing and proposed facilities at this site are shown in **Figure 2-23, Reclamation Ditch Diversion Conceptual Site Plan and Cross Section**

Tembladero Slough Diversion Pump Station at Castroville

The Tembladero Slough Diversion would consist of a new intake structure on the channel bottom, connecting to a new lift station wet well (manhole) on the channel bank via a new gravity pipeline. The new intake would be screened to prevent fish and trash from entering the new pump station. Two submersible pumps would be installed in the wet well, controlled by variable frequency drives. The electrical controls and drives would be in a locked, weatherproof cabinet near the wet well and above flood level. The new pump station would discharge through a new short force main (approximately 100-ft in length), discharging to the existing wet well at the MRWPCA Castroville Pump Station. A new underground valve vault would be installed along the force main to hold the check valves, isolation valves and flow meter. The channel banks and invert near the pump station intake would be lined with concrete to prevent scouring and facilitate the management of by-pass flows. Key existing and proposed facilities at this site are shown in **Figure 2-24, Tembladero Slough Diversion Conceptual Site Plan and Cross Section.**

Construction

Reclamation Ditch Diversion Site

Construction of the Reclamation Ditch diversion would include minor grading, installation of a wet well/diversion structure, modification of an existing sanitary sewer manhole and a short pipeline from the existing manhole to the new pump station. The work would disturb approximately 0.15 acres of land, including the Reclamation Ditch banks and channel bottom. The channel carries flow year-round, so a temporary coffer dam would be required above and below the site, with a small diversion pump to convey existing channel flows past the project construction area. The temporary coffer dams would consist of waterproof tarps or membranes wrapped around gravel fill material, which would be removed when the work is completed.

The new pump station wet well, intake structure and pipelines would be constructed using open-trench excavation. The construction excavation may be as large as 40-feet long by 10-feet wide. Due to the steepness of the banks and depth of the excavation, a tracked, long-arm excavator would be required. The below-grade components may use pre-cast concrete structures, so that the underground work would take less than a week to complete. Once the excavations are closed, the channel protection (concrete or riprap) may be installed and the temporary cofferdams and by-pass pumping system removed. The pumps and controls would be installed in the wet well and valve vault using a large excavator or crane.

During the period the channel is blocked with temporary cofferdams, the work may proceed 7 days a week to minimize the impact and duration. Electrical power used during construction may come from a temporary electrical service by PG&E, from permanent electrical service by PG&E if installed in advance of the site work, or from portable generators. The by-pass pumps would need to operate until the in-channel work is complete, so power would be required 24-hours a day. The site is in an industrial area, so there are no nearby residents to be disturbed by the noise at night.

Tembladero Slough Diversion Site

Construction of the Tembladero Slough diversion would include minor grading, installation of a new wet well/diversion structure, modification of the existing wet well at the Castroville Pump Station and construction of a short pipeline from the wet well to the new pump station. The work would disturb approximately 0.25 acres of land, including the Tembladero Slough banks and channel bottom. The channel carries flow year-round, so a temporary coffer dam would be required around the construction site, with a small channel left open to allow flows past the project site. The temporary coffer dams may consist of geomembrane tubes filled with water or driven sheet piles, depending upon the site conditions. Any cofferdam installed would be removed when the work is completed.

The new pump station wet well, intake structure and pipelines would be constructed using open-trench excavation. The construction excavation may be as large as 100-feet long by 10-feet wide. Due to the steepness of the banks and depth of the excavation, a tracked, long-arm excavator would be required. The below-grade components may use pre-cast concrete structures, so that the underground work would take less than a week to complete. Once the excavations are closed, the channel protection (concrete or riprap) would be installed and the temporary cofferdams and dewatering pumping system removed. The diversion pumps and controls would be installed in the wet well and valve vault using a tracked excavator or crane.

Modification of the existing pump station wet well may require by-pass pumping of the existing wastewater flows within the pump station. A portable electric or engine-driven by-pass pump may be required. The new pipeline connecting the new pump station to the existing wet well would be installed using open trench methods.

During the period the channel is blocked with temporary cofferdams, the work may proceed 7 days a week to minimize the impact and duration.

Electrical power used during construction may come from a temporary electrical service by PG&E, the permanent electrical service by PG&E if installed in advance of the site work, or from portable generators. The dewatering pumps would need to operate until the in-channel work is complete, so power would be required 24-hours a day. The site is in an agricultural area, with only one nearby residence located approximately 1,000 feet north of the site.

Operations and Maintenance

Both the Reclamation Ditch Pump Station and the Tembladero Slough Pump Station would be configured to operate autonomously, based upon diversion and by-pass flow settings. A system operator would visit each site at most once per day to check for alarms and vandalism, and to visually inspect the intake screen for clogging. The Tembladero Slough site is adjacent to the MRWPCA Castroville Pump Station, so those inspections would be performed by the same operator at that pump station, requiring no additional staff or visits. The Reclamation Ditch is assumed to require one employee visit per day at most (two one-way trips). Approximately once per month an operator would need to access the channel bottom to physically clear vegetation or debris from the intake screen. The pumps would require annual inspection and servicing, using a lift truck to remove the pumps from the wet well. The flow meters would require inspection and calibration less than once per year.

2.7.2.7 Blanco Drain

Description and Estimated Yield

Potential flow diversion from the Blanco Drain was analyzed using data from the existing pump station location, based on station operating records. Due to the limited flow data available, the yield was estimated as a percentage of the applied irrigation and rainfall across the watershed. An average annual yield of 2,620 AFY was calculated, which equates to an average return rate of 17%. A water right permit for diversions up to 6 cfs would be required to capture that full amount. The monthly yields are provided in **Table 2-17, Estimated Average-Year Diversion from the Blanco Drain (acre-feet)**. Due to the existing pump station and slide gate operations, poor water quality, and lack of aquatic habitat in this channel, these yield estimates assume that all available flow would be diverted, and none would be required to remain in-stream.

Table 2-17
Estimated Average-Year Diversion from the Blanco Drain (acre-feet)

Rate	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
6.0 cfs	209	223	246	252	225	274	277	244	184	168	133	185	2,620

The Blanco Drain is the only source of supply not located near an existing wastewater collection facility which might be used to convey flows to the Regional Treatment Plant. Development of this source would require not only a new pump station, but also a two-mile pipeline that would cross under the Salinas River.

Diversion Method and Facilities

The proposed new Blanco Drain Diversion pump station would be located adjacent to the existing seasonal pump station operated by Monterey County Water Resources Agency. The new pump station would consist of a new intake structure on the channel bottom, connecting to a new wet well (manhole) on the channel bank via a new gravity pipeline. The intake would be screened to prevent debris and trash from entering the pump station. Two submersible pumps would be installed in the wet well, controlled by variable frequency drives. The electrical controls and drives would be in a locked, weatherproof cabinet above the wet well and above flood level. The new pump station would discharge through a new 18-inch force main running from the pump station to a connection in the existing 36-inch Salinas Interceptor before it discharges into the headworks of the Regional Treatment Plant.[22] The segment of the pipeline crossing the Salinas River would be installed using trenchless methods. A new underground valve vault would be installed adjacent to the pump station to hold the check and isolation valves, and a second vault would hold the flow meter. Due to the high pressure in the pipeline, a new surge tank would be installed at the new pump station. The channel banks and invert near the pump station intake would be lined with concrete to prevent scouring. When the new pump station is operating, the existing slide gate in the channel would be closed to facilitate diversion of all flows to the Regional Treatment Plant. Key existing and proposed facilities at this site are shown in **Figure 2-25, Blanco Drain Diversion Pump Station and Force Main Conceptual Site Plan.**

Construction

Construction of the Blanco Drain Diversion would include minor grading, installation of a new wet well/diversion structure, installation of a new force main by open trench and by trenchless methods. The work would temporarily disturb approximately 0.15 acres of land at the pump station, including the Blanco Drain banks and channel bottom, and approximately 5 acres along the pipeline alignment including the excavation pits for constructing the pipeline under the Salinas River. The channel carries flow year-round, so a temporary coffer dam would be required above the construction site, with a small diversion pump to convey existing channel flows past the project site and the existing slide gate downstream of the adjacent Monterey County Water Resources Agency pump station. The temporary coffer dam would consist of a waterproof tarps or membrane wrapped around gravel fill material, which would be removed when the work is completed. West of the river crossing and south of the landfill site, the new force main would intersect the existing MRWPCA Salinas Interceptor. The new Blanco Drain source water force main would connect to the existing Salinas Interceptor to the Regional Treatment Plant headworks. A hydraulic analysis of the Salinas Interceptor will be conducted during final design to determine the feasibility of the upstream connection from the Blanco Drain source water force main. The EIR analysis in Chapter 4 assumes that the new pipeline would go all the way to the headworks at the Regional Treatment Plant. Any reduction in length of the pipeline that might be achieved through this modification would result in less environmental impacts.

[22] Two options are currently being considered to connect the Blanco Drain diversion pipeline to the Salinas Interceptor before it enters the headworks. One option connects at the headworks and the other option connects 1,000 feet further upstream. The current proposal for the location of the connection is shown on **Figure 2-25, Blanco Drain Diversion Pump Station and Force Main Conceptual Site Plan**.

The new pump station wet well, intake structure and on-site pipelines would be constructed using open-trench excavation. The construction excavation may be as large as 40-feet long by 10-feet wide. Due to the steepness of the banks and depth of the excavation, a tracked, long-arm excavator would be required. The below-grade components may use pre-cast concrete structures, so that the underground work would take less than a week to complete. Once the excavations are closed, the channel protection (concrete or riprap) may be installed and the temporary cofferdam and by-pass pumping system removed. The concrete deck, pumps and controls would be installed in the wet well and valve vault and hydropneumatic tank installed using a tracked excavator or crane. Some cast-in-place concrete work is expected, requiring concrete trucks accessing the site.

During the period the channel is blocked with temporary cofferdams, the work may proceed 7 days a week to minimize the impact and duration. A portion of the new pipeline must be installed using trenchless methods. That work may require 24-hour operations during the drilling phase. A portion of the pipeline would be installed within the existing Regional Treatment Plant site. That work may be performed at night to minimize impacts to plant operations.

The force main pipeline must cross under the Salinas River. This work would be performed using a trenchless method, most likely directional drilling. The crossing method would be determined during detailed design and permitting. Trenchless construction would require work areas approximately 40-ft by 60-ft on each side of the river. The rest of the pipeline may be installed using open-trench methods. The final portion of the pipeline would cross the existing Regional Treatment Plant site and may require limited bore and jack construction to cross existing utilities which must remain in-service.

Electrical power used during construction may come from a temporary electrical service by PG&E, the permanent electrical service by PG&E if installed in advance of the site work, or from portable generators. Permanent electrical service already exists on-site at the Monterey County Water Resources Agency pump station and Regional Treatment Plant site, so it is anticipated that a temporary construction power service would be available. The by-pass pumps would need to operate until the in-channel work is complete, so power would be required 24-hours a day. The site is isolated from any urban uses within an agricultural area, so there are no nearby residents to be disturbed by nighttime construction.

Operations and Maintenance

The Blanco Drain Pump Station would be similar to the Reclamation Ditch and Tembladero Slough Pump Stations, configured to operate autonomously based upon diversion settings. A system operator would visit the site once a day to check for alarms, vandalism and to visually inspect the intake screen for clogging. The site is adjacent to the Monterey County Water Resources Agency's Blanco Drain Pump Station, and may require separate visits by operators from the two agencies or the two agencies can enter into an agreement for shared maintenance responsibilities. The existing Monterey County Water Resources Agency pump station operates currently and the diversion would operate in a similar way. Consequently the number of daily operator visits would not increase measurably. Approximately once per month an operator would need to access the channel bottom to physically clear vegetation or debris from the intake screen. The pumps would require annual inspection and servicing, using a lift truck to remove the pumps from the wet well. Since the two pump stations are the responsibility of different agencies, scheduled maintenance would be independent of the adjacent pump station. The new station flow meter would require inspection and calibration at a less-than-annual frequency.

The pipeline valves would be inspected and exercised once per year. Any above-grade air-release valves would be inspected quarterly, requiring a system operator to drive the pipeline alignment.

2.7.2.8 Lake El Estero Storage Management Water

Description and Estimated Yield

Monterey Peninsula urban stormwater and dry weather runoff that flows into Lake El Estero is currently stored in the lake and then pumped by the City of Monterey, or allowed to flow by gravity, through storm drain pipelines to Del Monte Beach.

To use water from this source for the Proposed Project, the portion of the Lake El Estero water that currently is pumped or flows onto Del Monte Beach into Monterey Bay would, instead, be diverted via a short new pipeline, using a new pump or by gravity flow, into the municipal wastewater system at a sanitary sewer manhole immediately adjacent to the existing Lake El Estero pump station. After the lake water enters the manhole, it would flow through an existing 21-inch City sanitary sewer main into the existing Pacific Grove interceptor and then to the existing MRWPCA Monterey Pump Station.[23] From there, the water would flow through the existing MRWPCA conveyance system to the Regional Treatment Plant. This new diversion system would capture stormwater which would otherwise be discharged to the Monterey Bay; the average lake level would remain unchanged. The new physical facilities proposed to be constructed to divert this source water are described in **Section 2.6.1.3.**

This source would yield an average raw water supply of 87 AFY, based upon estimated daily runoff into the Lake and available conveyance capacity in the municipal wastewater system. This flow estimate is based on monitoring data collected between November 2013 and March 2014 at the existing 21-inch City of Monterey sanitary sewer gravity main between the Lake El Estero diversion site and the MRWPCA collection system. Monitoring indicated that the gravity main is half full at the daily peak hour, leaving an estimated 2,400 gallons per minute (or 3.5 mgd) of available wet weather capacity.

The memorandum describing the methodology for calculating flows available for diversion to the Regional Treatment Plant is found in **Appendix R** (Schaaf & Wheeler, 2014a).

Diversion Method and Facilities

The Lake El Estero Source Water Diversion System would consist of one of the following options: (1) installation of a new pumping system, consisting of a new column pump installed in the wet well of the existing lake management pump station, upgrades to the existing electric panel, and a new 30-foot long, 12-inch diameter discharge pipe to the sanitary sewer; or (2) installation of a new gravity system, consisting of a new headwall and screened intake pipe on the lake bank, a new 40-foot long, 12-inch diameter discharge pipe to the sanitary sewer, and a

[23] This Proposed Project component is intended to operate the same as the existing lake management pumping activities conducted by the City except that pumping would occur to the sanitary sewer system in lieu of pumping to Del Monte Beach. The City currently pumps down the lake levels to prevent flooding. That practice would continue but the water would be diverted to the sewer system instead of released to the beach. The City would continue to maintain adequate lake levels to allow the City to irrigate its nearby parks with Lake El Estero water.

new controlled and motorized isolation valve. Both systems would be entirely underground or within existing pump dry and wet well structures and the connecting pipeline would include a flow meter and a check valve to prevent backflow of sewage into the lake. The City and MRWPCA would select the preferred option based upon technical and economic considerations at the time that design plans are prepared. Key existing and proposed facilities at this site are shown in **Figure 2-26, Lake El Estero Diversion Conceptual Site Plan and Cross-Section.** Either of the proposed new diversion systems would require some maintenance and would include controls to prevent overloading the wastewater collection system.

Construction

At the Lake El Estero Diversion site, less than 0.1 acres of disturbance would occur. The disturbance would be entirely within the paved area of the existing pump station at that site. Pavement demolition, trenching and installation of new pumps/pump motors, electrical facilities, and flow meters would all be installed below grade using only equipment delivery trucks, loaders, and backhoes.

Operations and Maintenance

The Lake El Estero diversion pump station would operate autonomously, based upon lake levels and water levels in the receiving sanitary sewer. System operators from the City would visit the site with the same frequency as operators visit the existing pump station, approximately once per week when not operating and multiple times per day while in operation. If a lakeside intake is used, approximately once per month an operator may need to physically clear vegetation or debris from the intake screen. The pumps would require annual inspection and servicing, using a lift truck to remove the pumps from the wet well. This maintenance may be scheduled to coincide with the adjacent pump station. The flow meter would require inspection and calibration less than once per year.

2.8 Treatment Facilities at the Regional Treatment Plant

2.8.1 Overview of Treatment Facilities at the Regional Treatment Plant

Under the Proposed Project, a new AWT Facility would be constructed to receive Regional Treatment Plant secondary effluent for advanced treatment and, ultimately, injection into the Seaside Groundwater Basin.[24] In addition, modifications to the existing Salinas Valley Reclamation Plant are proposed in order to enable increased use of tertiary treated wastewater for crop irrigation during winter months. The proposed new and modified treatment facilities at the Regional Treatment Plant, including the Advanced Water Treatment Facility (or AWT Facility) and the Salinas Valley Reclamation Plant Modifications, would be constructed on approximately 3.5 acres of land within the MRWPCA Regional Treatment Plant (Regional

[24] As described in previous sections, the Proposed Project proposes to divert additional water sources and convey those waters with municipal effluent to the Regional Treatment Plant, including urban and agricultural runoff, agricultural wash water flows, and excess/unused Regional Treatment Plant secondary-treated wastewater.

Treatment Plant) site west of the existing treatment facilities (see **Figure 2-10, Projected Regional Treatment Plant Flows).** The following is a list of the proposed structures and facilities proposed to be constructed at the Regional Treatment Plant (see **Figure 2-27, Advanced Water Treatment Facility Site Plan**):

- inlet source water diversion structure, an influent pump station, and an approximately 360-foot long, 24-inch diameter pipeline to bring secondary effluent to the AWT Facility;
- advanced treatment process facilities, including
- chloramination,
- ozonation,
- biologically active filtration (if required),
- automatic straining,
- membrane filtration treatment,
- booster pumping of the membrane filtration filtrate,
- cartridge filtration,
- chemical addition,
- reverse osmosis membrane treatment,
- advanced oxidation using ultraviolet light and hydrogen peroxide (advanced oxidation),
- decarbonation, and
- product-water stabilization with calcium, alkalinity and pH adjustment;
- final product storage and distribution pumping;
- brine mixing facilities; and
- modifications to the Salinas Valley Reclamation Plant (see **Section 2.8.2** for a detailed description this Proposed Project component).

The proposed advanced treatment facilities would include several structures as tall as 31 feet and totaling approximately 60,000 square feet. The proposed brine mixing facility would be up to 16 feet tall and totaling approximately 10,000 square feet. New pipes and pumps would be underground. Additional information on each component of the AWT Facility is presented in the following sections. **Figure 2-28, Proposed Advanced Water Treatment Flow Diagram,** provides a simplified AWT Facility process flow diagram illustrating the proposed treatment facilities.

2.8.1.1 AWT Facility Design Flows and System Waste Streams

The proposed new AWT Facility would have a design capacity of 4.0 mgd of product water. As described in **Section 2.7.1**, a range of monthly source water flows has been estimated, depending upon the seasonal availability of source waters. The facility would be operated to produce up to 3,700 AFY of purified recycled water for injection, which equates to an annual production rate of 3.3 mgd. The 4.0 mgd facility size is required to allow for peak seasonal operation and system down time. Similarly, the system components must be sized to allow for losses during treatment such as backwashing and brine disposal. Additional information on the proposed AWT Facility component design is presented in **Tables 2-18 and 2-19.**

Table 2-18

AWT Facilities Design Summary

Component	Design Capacity (See Note a)
Pipeline from secondary treatment system outfall pipe to AWT Facility	N/A
AWT Facility Influent Wetwell	0.2 mg
Influent Pumping (see Note b)	2.7 to 5.9 mgd
Ozone System(see Note b)	5.9 mgd
Biologically Active Filtration (if required) (see Note c)	5.5 mgd
Membrane Filtration System	4.9 mgd
Reverse Osmosis System	2.2 to 4.9 mgd
Advanced Oxidation System, Product Water Stabilization and Pumping	4.0 mgd

Notes:
a. Capacities represent process feedwater flows; units are million gallons (mg) and million gallons per day (mgd).
b. For the case where biological filtration is not included, the range for the influent pumping would be 2.7 to 5.5 mgd, and the ozone system would be sized for 5.5 mgd.
c. The biologically active filtration would be sized to treat up to 80 percent of the process flow; the 5.5 mgd represents the total product flow when combined with the by-pass.

In producing highly purified water, the proposed new AWT Facility would also produce two to three waste streams: biological filtration backwash (if included in the system), membrane filtration backwash, and reverse osmosis concentrate. The biological filtration backwash and membrane filtration backwash would be diverted back to the Regional Treatment Plant headworks. The reverse osmosis concentrate would be piped to a proposed new brine and effluent receiving, mixing, and monitoring facility. The AWT Facility is expected to be able to produce water at up to 90% of design capacity, on average, due to some anticipated down time for membrane "clean in place" practices and repairs. The down time is assumed to be evenly distributed each month, though planned events would be scheduled for times when the least source water is available. The AWT Facility would need to be large enough to produce the required product water during the operational times (90% of each month). The resulting flow quantities for the AWT Facility are shown in **Table 2-19, Proposed Project AWT Facility Process Design Flow Assumptions** below.

Based on these assumptions (including the 90% in-service, 81% reverse osmosis recovery, 90% microfiltration recovery), an AWT Facility design flow rate of 4.0 mgd would be required to provide up to 3,700 AFY of high quality water for groundwater injection.

Table 2-19
Proposed Project AWT Facility Process Design Flow Assumptions

AWT Facility Process	Annual Flows[1] AFY	Average Flow Conditions[1] mgd	Maximum Flow Conditions[2] mgd
Ozone System Feed	5,496	4.9	5.9
Biologically Active Filtration Feed	4,481	4.0	4.8
Biologically Active Filtration Backwash returned to Regional Treatment Plant Headworks	421	0.4	0.5
Biologically Active Filtration Bypass[3]	1,015	0.9	1.1
Membrane Filtration Feed	5,075	4.5	5.5
Membrane Filtration Backwash retuned to Regional Treatment Plant Headworks	508	0.5	0.6
Reverse Osmosis Feed	4,567	4.1	4.9
Reverse Osmosis Concentrate	867	0.8	0.9
Reverse Osmosis Product Water (AWT Facility Design Size)	3,700	3.3	4.0
Advanced Oxidation Process	3,700	3.3	4.0

Notes:
1. Average annual flows reflect 3,700 AFY, typical annual production while building the drought reserve.
2. Maximum flow condition reflects design peak production rate.
3. 80% of the flow would pass through the Biologically Active Filtration, and 20% may bypass directly to the membrane filtration

2.8.1.2 Inlet Raw Water Diversion Structure and Pump Station

A new diversion structure would be installed on an existing secondary effluent pipeline at the Regional Treatment Plant to divert and convey secondary effluent source water through a new gravity pipeline to the proposed AWT Facility. A new influent pump station consisting of a subgrade wetwell and pumps would accept and equalize the Regional Treatment Plant secondary effluent flow.

2.8.1.3 Raw Water Pretreatment

Before membrane filtration, the secondary effluent would be pretreated using pre-screening and up to three separate subsystems:

- Chloramination
- Ozonation
- Biological filtration (if required)

Chloramination. Chloramines would be used to reduce biofouling of the membrane systems. The chloramination system would include sodium hypochlorite storage, and chemical feed pumps and an inline injection and mixing system. Sodium hypochlorite would be injected upstream of ozonation or upstream of membrane filtration. Sodium hypochlorite reacts with ammonia present in the source water to form chloramine, which is an effective biocide that reduces biological fouling on the membrane filtration and reverse osmosis process membranes.

Ozonation. Ozone treatment is proposed to provide a chemical/pathogen destruction barrier and reduce the membrane fouling. The ozone system would be comprised of several components: liquid oxygen storage and vaporizers or an onsite oxygen generator; a nitrogen boost system; an ozone generator and power supply unit; a cooling water system; a side-stream injection system; ozone contactor; and ozone destruct units. There are two potential approaches for supplying high-purity oxygen for ozone generation: (1) liquid oxygen delivered to onsite cryogenic storage tanks and evaporated through vaporizers, or (2) produce oxygen at the treatment facility using a pressure-swing adsorption oxygen generation system. The liquid oxygen system is included in the 10% design, but an on-site generation system would occupy approximately the same amount of space. Ozone generators would convert oxygen gas into a mixture of oxygen and ozone gas. The mixture of oxygen and ozone gas would be injected into a side stream of feed water flow that would then be recombined with the main supply line after ozone injection. The ozonated water would flow into one or more parallel contactors to provide contact time for disinfection/oxidation, ozone residual decay, and off-gassing. Off-gas would be treated through a catalytic-based ozone destruct system to prevent the release of ozone to the atmosphere. Once dissolved in the process water, ozone reacts with various contaminants in the water, resulting in several treatment benefits, including (1) reduction of organic compounds that cause membrane fouling, (2) reduction of many constituents of emerging concern (CECs),[25] and (3) inactivation of pathogenic microorganisms. A quenching system to eliminate any ozone residual that remains in the water is included at the end of this process step. Quenching would be performed through the addition of sodium bisulfite, hydrogen peroxide or calcium thiosulfate, which would be stored on-site.

[25] See **Chapter 3. Water Quality Permitting and Regulatory Overview** for more information about the current understanding and regulation of these substances.

Biologically Active Filtration (if required): This process may be used downstream of ozone treatment to reduce the concentration of ammonia and residual organic matter present in the ozone effluent and to reduce the solids loading on the membrane filtration process. The biologically active filtration system would consist of gravity-feed filter basins with approximately 12 feet of granular media, and an underdrain/media support system. Ancillary systems would include an alkalinity addition system for pH control, backwash water basin (also used for membrane filtration backwash), backwash pumps, an air compressor and supply system for an air scour system, an air compressor and supply system for process air, and a wash water basin to facilitate filter backwashing. Depending upon the discharge permitting conditions, this process step may not be required; therefore, it may not be constructed until the AWT Facility completes initial start-up and testing.

2.8.1.4 Microfiltration/Ultrafiltration Membrane Treatment System

The membrane filtration system would remove suspended and colloidal solids, including bacteria and protozoa through hollow fiber membrane modules. Additional components of the membrane filtration system include valve manifolds to direct the flow of feed, filtrate, cleaning system, backwash supply, backwash waste, and compressed air to the corresponding module piping. Feed pumps would draw water from the feed clearwell and supply a pressurized feed to pretreatment strainers and the membrane units. Cleaning chemicals would include acid, caustic, and sodium hypochlorite, which would be stored on-site. Backwash and screening residuals would be adjusted to a neutral pH and returned to the Regional Treatment Plant headworks, along with residuals associated with the cleaning system. The projected recovery of treated water from the membrane filter system is roughly 90%; this recovery accounts for waste residuals associated with backwashing, cleaning, and pretreatment straining.

2.8.1.5 Reverse Osmosis Membrane Treatment System

A reverse osmosis process that employs semi-permeable membranes is proposed to remove dissolved salts, inorganic and organic constituents, and pathogens from the membrane filtration treated water. The proposed reverse osmosis system would consist of a single pass, which separates the membrane filtration filtrate feed water into a purified product stream (permeate) and a concentrated brine stream (concentrate). The proposed reverse osmosis would include a second stage to increase the product water recovery.

The proposed reverse osmosis system would include individual process trains, housing the process membranes in pressure vessels along with connecting piping and valve manifolds for feed, permeate, concentrate, cleaning and flush supplies. The ancillary equipment for the overall reverse osmosis system would include a membrane cleaning system and permeate flush system. Reverse osmosis membrane cleaning chemicals would likely include proprietary anticipant chemicals, acid, and caustic detergent, stored on-site.

Feed to the reverse osmosis system would be delivered from the upstream membrane filtration system through an intermediate equalization tank. Low-pressure booster pumps would move the water into the pretreatment system. Pretreatment would include cartridge filters, followed by the addition of an antiscalant and acid to lower the pH, which would be injected into a low pressure line. High-pressure feed pumps would move the water from pretreatment into the reverse osmosis treatment trains. Concentrate from the reverse osmosis system would be discharged to a new brine mixing structure with final disposal through the existing MRWPCA ocean outfall. Product water would flow to the advanced oxidation system. Separate cleaning and flush system equipment would also be included.

2.8.1.6 Advanced Oxidation Process System

The proposed advanced oxidation system would provide a final polishing step for pathogen disinfection and an additional chemical destruction barrier for the reverse osmosis permeate. The proposed advanced oxidation system would consist of a chemical feed to add hydrogen peroxide and reactors housing arrays of ultraviolet lamps along with ballasts to power the ultraviolet system. Ultraviolet light reacts with hydrogen peroxide to form hydroxyl radicals, which, along with the ultraviolet light, oxidizes, destroys, or inactivates chemicals of concern and pathogens. The system sizing would be driven by the requirement in the California Code of Regulations, Title 22, §60320.200 et seq., "Indirect Potable Reuse: Groundwater Replenishment – Subsurface Application" criteria for advanced oxidation. Support facilities for the reactors would include chemical storage and metering pumps, and ballasts. The advanced oxidation product water would be directed to the post-treatment system for stabilization.

2.8.1.7 Post-Treatment System

Product water from the advanced oxidation process would be sent to the proposed post-treatment system. Due to the high removal of minerals that is achieved through reverse osmosis treatment, post-treatment stabilization of the product water would be needed to prevent corrosion of pipe materials in the product water conveyance system. Stabilization would also be used to reduce the potential for product water to leach minerals and other chemicals from the soils within the Seaside Groundwater Basin upon injection. Reverse osmosis permeate is a soft, low alkalinity water, and the final product water quality would be adjusted to specific goals for hardness, alkalinity, and pH. This adjustment would include decarbonation by air stripping to remove carbon dioxide (CO_2), the addition of calcium and alkalinity, and pH adjustment with CO_2 addition. There are two proposed options for calcium and alkalinity adjustment: (1) the addition of purchased hydrate lime slurry (calcium hydroxide slurry), or (2) addition of sodium hydroxide (NaOH) and calcium chloride ($CaCl_2$). Sodium hypochlorite may be added to the product water for secondary disinfection.

2.8.1.8 Product Water Pump Station

The new Product Water Pump Station would be located at the AWT Facility immediately south of the product water stabilization facilities. This pump station is described in detail in **Section 2.9**, **Product Water Conveyance Facilities**, below.

2.8.1.9 Brine Mixing Facility

As discussed above, the new AWT Facility would produce reverse osmosis concentrate water that would be disposed or discharged via the MRWPCA's existing ocean outfall. In addition to the AWT reverse osmosis reject water, other water that is currently discharged to the outfall includes secondary effluent from the Regional Treatment Plant, and brine waste collected from individual water softeners and private desalination facilities and delivered by truck to the Regional Treatment Plant. Proper disposal of these waste streams to the outfall, and eventually the ocean, requires flow metering and water quality sampling and monitoring. The proposed new brine mixing facility would accomplish the required mixing, metering and sampling, using the following processes and facilities:

- Two (2) cast-in-place concrete vaults on the existing outfall, one to divert secondary treated effluent to the mixing facility and one approximately 170-ft downstream to return the blended flows to the outfall. Both structures would be equipped with two slide gates to control the amount of secondary effluent diverted through the mixing facility and passed through to the outfall

- A cast-in-place concrete mixing structure, configured to receive secondary effluent and brine waste from separate inflow pipes and equipped with a 60-inch (nominal) static mixer in a fiberglass mixing pipe and an air release valve on the upstream end of the static mixer
- A 54-inch pipeline (high density polyethylene) from the diversion vault to the mixing structure and then to the return vault
- 48-inch flow meters on the pipelines entering and leaving the mixing structure, installed below-grade in concrete boxes
- A sampling port in the return vault for access to measure total dissolved solids, pH, dissolved oxygen temperature, and other constituents of the blended effluent as required by permit conditions

Only one new above-grade structure, the Lab and Control Building would be built and would receive architectural treatment similar to the other buildings at the Regional Treatment Plant. The maximum depth of excavation would be 30 to 32 feet. A new cast concrete driveway would extend from the existing road on the north side to the Lab and Control Building delivery door on the north side. A new four-foot wide concrete walkway would extend along the south side. Storm water drainage would be directed through site grading to a new retention basin at the west end of the site for percolation.

2.8.1.10 Power Supply

The AWT Facility power would be supplied through a new PG&E utility connection to the Regional Treatment Plant. The system components would include a utility service, transformers, and switchgear. The major electrical loads would be from the new influent pumping, oxygen generator (if liquid oxygen is not used), ozone generator, biological filtration backwash pumps (if included in the final system), membrane filtration and reverse osmosis feedwater pumping, ultraviolet light reactors, and product water pumping. In the case of a power failure, the AWT Facility would shut down and the secondary treated influent water would bypass the AWT Facility and be discharged to Monterey Bay, if not used first by the Salinas Valley Reclamation Plant. The Regional Treatment Plant has three power supplies: cogeneration, utility connection, and a standby diesel generator. If all three power supplies fail, there are provisions to connect mobile generators to the critical facilities. See **Section 2.6.3** for a summary of the power demands of the proposed Treatment Facilities at the Regional Treatment Plant. (Source: V. Badani, E2 Consulting Engineers; A. Wesner, SPI Engineering; B. Holden' MRWPCA; and T.G. Cole, October 2014)

2.8.1.11 AWT Facility Construction

Construction workers would access the proposed AWT Facility site via Charles Benson Road and existing access roads serving the existing treatment plant. Construction activities would include cutting, laying, and welding pipelines and pipe connections; pouring concrete footings for foundations, tanks, and other support equipment; constructing walls and roofs; assembling and installing major advanced treatment process components; installing piping, pumps, storage tanks, and electrical equipment; testing and commissioning facilities; and finish work such as paving, landscaping, and fencing the perimeter of the site. Construction equipment would include excavators, backhoes, graders, pavers, rollers, bulldozers, concrete trucks, flatbed trucks, boom trucks and/or cranes, forklifts, welding equipment, dump trucks, air compressors, and generators. Mechanical components of the pretreatment, membrane filtration systems, reverse osmosis, advanced oxidation, and post-treatment facilities would be prefabricated and delivered to the site for installation. Approximately 3.5 acres would be disturbed during construction. Construction activities related to the AWT Facility are expected to occur over 18 months, plus three months for testing and start-up.

2.8.1.12 AWT Facility Operation

Regional Treatment Plant secondary effluent that would include a treated mixture of the source waters would be drawn from a new diversion structure on an existing main pipeline. Pumping facilities would be controlled remotely through the AWT SCADA system. The AWT Facility would operate at an overall water recovery rate of 81 percent.[26] Waste residuals would include backwash from the biological filtration system (if included), backwash and cleaning wastes from the membrane filtration treatment system and concentrate and cleaning wastes from the reverse osmosis system. Cleaning wastes from each system would be neutralized and returned to the head of the Regional Treatment Plant, along with backwash waste residuals from the membrane treatment system. Reverse osmosis concentrate would be discharged through a new brine mixing structure to the existing Regional Treatment Plant ocean outfall. The AWT Facility would target an annual production rate of up to 3,700 AFY, requiring an average annual reverse osmosis feed supply of 4,568 AFY and producing waste residuals (reverse osmosis concentrate) of 868 AFY.

2.8.2 Overview of Salinas Valley Reclamation Plant Modifications

The existing Salinas Valley Reclamation Plant produces tertiary-treated, disinfected recycled water for agricultural irrigation within the CSIP service area. The Salinas Valley Reclamation Plant can only operate within the range of 5 to 29.6 mgd. When off-peak irrigation demands fall below the minimum plant capacity, those demands are met using Salinas Valley Groundwater. The Proposed Project includes Salinas Valley Reclamation Plant modifications to allow tertiary treatment at lower daily production rates, facilitating increased use of recycled water during the late fall, winter and early spring months to meet demands as low as 0.5 mgd.

The existing Salinas Valley Reclamation Plant uses a three step chemical and filtration process (**Figure 2-29, Salinas Valley Reclamation Plant Process Flow Diagram**). Secondary treated effluent from the Regional Treatment Plant is pumped to a flocculation basin where an alum polymer is introduced to bind together any remaining dissolved organic matter. This creates tiny clumps called floc. In the second step, the floc is removed in the tertiary filters. Treated water filters through a 6-foot bed of anthracite coal, sand and gravel in which the floc is trapped. After filtration, the water flows to the third step for disinfection in the chlorine contact basins. Disinfection destroys pathogens by maintaining a specific chlorine level in the water for at least one and one half hours. The final product is clear, odorless and safe to use for irrigation of food

[26] This recovery rate does not include the filter backwash flows routed through the Regional Treatment Plant, as these flows would be recycled through the plant and return as source water, thus not decreasing the system recovery.

crops. The recycled water is temporarily held in an 80 acre-foot storage pond before it is distributed to growers via the CSIP pipelines[27].

The Salinas Valley Reclamation Plant has a design capacity from 8 mgd to 29.6 mgd. Through operational efficiencies, the plant managers can meet irrigation demands as low as 5 mgd, which is still not small enough for winter and wet-year demands. These small irrigation demands are currently met using Salinas Valley groundwater. Under the Proposed Project, the Salinas Valley Reclamation Plant would be enhanced to enable the plant to produce more continuous flows in the winter when demand by the CSIP growers decreases to as low as 0.5 mgd. Proposed improvements would include new sluice gates, a new pipeline between the existing inlet and outlet structures within the storage pond, chlorination basin upgrades, and a new storage pond platform. Instead of holding recycled water in the 80 acre-foot pond, one of the chlorine contact basins would be used as a wet-season storage reservoir, while the second basin would continue to function as the disinfection step. All of the modifications would occur within the existing Salinas Valley Reclamation Plant footprint. This component is expected to facilitate the delivery of up to 1,283 AFY of additional recycled water to the CSIP area.

2.8.2.1 Construction

Modification of the existing Salinas Valley Reclamation Plant would primarily occur within the existing 16-acre plant site. Installation of motorized sluice gates in the chlorine contact basins, installation of a motorized sluice gate and platform at the entrance of the storage pond, installation of a pipeline between the entrance and exit structures within the storage pond, and motorizing the existing sluice gate at the exit of the storage pond all would be within the existing Salinas Valley Reclamation Plant. Construction activities would include cutting, laying, and welding pipelines and pipe connections; pouring concrete footings for foundations, and other support equipment; installing piping, sluice gates and electrical equipment; testing and commissioning facilities; and finish work such as repairing the existing storage pond lining. Construction equipment would include excavators, backhoes, concrete trucks, flatbed trucks, boom trucks and/or cranes, forklifts, welding equipment, dump trucks, air compressors, temporary tanks and generators. Construction activities related to the Salinas Valley Reclamation Plant Modifications are expected to occur over 12 months. Any work requiring a full system shut-down would occur during the winter months when irrigation demands for recycled water are lowest.

2.8.2.2 Salinas Valley Reclamation Plant Facility Operation and Maintenance

Operation of the modified facility would be similar to the current operational method. During the peak irrigation season, the plant would operate at full capacity with both chlorine contact basins used for disinfection and the 80 acre-foot pond used for tertiary-treated product water storage. During the off-peak, low demand months, normal low flow (5 to 8 mgd) volumes of flow would be sent to the plant, one or two coagulation/flocculation tanks would be used, between one and three filters would be active, and only one chlorine contact tank would be used for disinfection, while the other tank would provide product water storage. When the tertiary-treated product water has filled the storage basin, the flow to the Salinas Valley Reclamation Plant could be

[27] Salinas Valley Reclamation Plant description at: http://www.mrwpca.org/about_facilities_water_recycling.php, accessed October 2014.

reduced or stopped until additional water is needed. This production would reduce the amount of secondary-treated wastewater discharged to the ocean outfall.

Operation of the system year-round would increase the time required for system maintenance, because portions of the treatment train would remain in operation as compared to the current winter shut-down. These operations occur year-round within the overall MRWPCA facility, so this increased maintenance window should not affect the overall daily level of maintenance effort.

2.9 PRODUCT WATER CONVEYANCE FACILITIES

The Proposed Project would include construction of a new pipeline to convey the advanced treated product water from the proposed AWT Facility to the Seaside Groundwater Basin for injection, along one of two potential pipeline alignments. The first alignment option, referred to herein as the RUWAP Alignment, would generally follow what is commonly known as the RUWAP (Regional Urban Water Augmentation Project) recycled water pipeline route through the City of Marina, California State University Monterey Bay, and the City of Seaside. The second alignment option, referred to herein as the Coastal Alignment, would follow in parallel with a portion of CalAm's proposed new Monterey Peninsula Water Supply Project desalination product water pipeline along the eastern side of the Transportation Agency of Monterey County (Transportation Agency) railroad tracks. See **Figure 2-18, Proposed Project Facilities Overview**. The southern portion of the Coastal Alignment would also be located in the former Fort Ord within the cities of Marina and Seaside. These two options for product water pipeline alignments are discussed in more detail below.

The northernmost component of the proposed new product water conveyance system would be the new AWT Product Water Pump Station (hereafter, the AWT Pump Station). As noted previously, the new AWT Pump Station is proposed to be located within the site of the proposed AWT Facility, all of which would be constructed within the current boundary of the MRWPCA's Regional Treatment Plant. The new AWT Pump Station would pump the AWT product water into the product water conveyance pipeline.

Farther down the new pipeline, either of the two alignments for the conveyance pipeline system would also require a new approximately 2,100 square foot and up to 25 feet tall Booster Pump Station to provide adequate pressure to convey the AWT product water to the proposed new Injection Well Facilities.

For the RUWAP Alignment, the 2,100 square-foot Booster Pump Station is proposed to be located on the east side of 5th Avenue, just south of 3rd Street in Marina. For the Coastal Alignment, the Booster Pump Station is proposed to be located at the southwest corner of the intersection of Divarty Street and Second Avenue, within the City of Seaside. The exact location for the Booster Pump Station at this intersection is yet to be determined; however, for the purposes of environmental analysis in this EIR, the location is assumed to be immediately adjacent to the intersection to minimize conflicts with future plans for development of that site. Each pipeline alignment option would also require new flow control valves, isolation valves, blow down structures for maintenance, air and vacuum release valves, and other appurtenant below ground facilities within the pipeline conveyance alignment. The proposed Booster Pump Station sites are shown on **Figure 2-18, Proposed Project Facilities Overview**.

2.9.1 Design Criteria of Product Water Conveyance

The proposed new Product Water Conveyance system is designed to convey a total of up to 3,700 AFY of product water to the proposed new injection wells. The conveyance system design would accommodate an average monthly flow of 3.3 mgd and a peak daily flow rate of 4.0 mgd. The AWT Facility may operate at daily rates as low as 1.3 mgd during periods when water is being “withdrawn” from the drought reserve. Several factors are expected to affect the actual daily flow rates through the conveyance system: seasonal variations; source water supply variations; down-time for maintenance of mechanical equipment of pumping systems and the AWT Facility; and maintenance of the wells. Hence, it is necessary and prudent to size facilities, particularly the conveyance pipeline, to handle these flow variations to enable the project to meet the annual recharge target volume of 3,700 AFY in a variety of conditions. Using this design flow criterion, the pipeline size would be 24 inches in diameter. A maximum daily flow of 4.0 mgd was used for the design criteria for the pump stations.

Other product water conveyance facility design provisions include standby pumping units for pump stations; in-line isolation valves on the pipeline approximately every 2,000 feet, in case an unforeseen leak occurs or subsequent construction activities result in damage to the pipeline; compliance with pipeline separation requirement by the SWRCB Division of Drinking Water; and remote monitoring of the Booster Pump Station performance and pipeline pressure via SCADA system.

2.9.1.1 RUWAP Product Water Alignment

The RUWAP Alignment would follow a portion of the recycled water pipeline alignment of Marina Coast Water District’s previously approved and partially-constructed Regional Urban Water Augmentation Program Recycled Water Project. The proposed new product water conveyance pipeline would be located primarily along paved roadway rights-of-way within urban areas. The Recycled Water Project was approved by the Marina Coast Water District in 2005; however, only portions of the recycled water distribution system have been built and no recycled water has been delivered to urban users. MRWPCA and the Water Management District may pursue agreements and permits to use a portion or portions of the pipeline originally proposed and/or constructed for the Recycled Water Project by Marina Coast Water District (i.e., converting the purpose of the pipeline for use by the Proposed Project to convey advanced-treated Product Water from the AWT Facility to the Injection Well Facilities) or they may pursue a shared easement to accommodate both pipelines in some portions of the alignment.

If the RUWAP Alignment is selected, the new product water conveyance pipeline would begin at the AWT Facility and run southeast along its western boundary and then depart the Regional Treatment Plant site in a southeasterly direction before turning southwest across the open country of the Armstrong Ranch and then entering the City of Marina street system. The alignment would follow Crescent Avenue south for about 4,000 feet, and then through several other streets, including California Avenue and 5th Avenue, until eventually intersecting General Jim Moore Boulevard (General Jim Moore). The pipeline route would be in the northbound lanes of General Jim Moore approximately 2 miles, past the developed, military housing area (called Fitch Park), through the open land around a water reservoir used by the nearby golf courses, connecting to Eucalyptus Road, then southerly to the Injection Well Facilities area. The portion of conveyance system from Normandy Drive south is common to both the Coastal and RUWAP Alignments. These alignments are shown on **Figure 2-18, Proposed Project Facilities Overview**.

Construction drawings prepared by Carollo Engineers, (90% design, dated December 2006) show the details of this RUWAP alignment up to Normandy Road. Portions of the pipeline within this alignment have been constructed by Marina Coast Water District, which reported that a segment in General Jim Moore from Normandy Road south to a point just north of Eucalyptus Road/Coe Avenue was constructed using 20-inch diameter pipe, and the pipeline continues south in General Jim Moore using 16-inch diameter pipe all the way to South Boundary Road.

If the RUWAP Alignment for the GWR product water conveyance pipeline is selected, the pipeline may be constructed by Marina Coast Water District in accordance with the currently designed RUWAP or MRWPCA may construct a separate pipeline parallel to the currently designed pipeline. **Figure 2-30, Product Water Conveyance Options near Regional Treatment Plant,** shows the location of the AWT Pump Station and the beginning portions of both product water alignment options.

2.9.1.2 Coastal Product Water Alignment

The Coastal Alignment would follow a portion of CalAm's proposed new Monterey Peninsula Water Supply Project desalination product water conveyance pipeline alignment that is currently the subject of CalAm's CPUC Application A.12-04-019.

If the Coastal Alignment is selected, the GWR product conveyance pipeline would depart from the Regional Treatment Plant site and run along its western boundary northerly to the Marina interceptor right of way.[28] From there, it would turn southwesterly along the Marina interceptor right of way to Del Monte Boulevard. The pipeline would turn south on Del Monte Boulevard and be located within land owned by the Transportation Agency for Monterey County (Transportation Agency) adjacent to the roadway. If the Coastal Alignment is selected, SWRCB Division of Drinking Water would require that MRWPCA and CalAm provide adequate separation between the existing MRWPCA wastewater interceptor in this area, the new GWR product water pipeline and CalAm's Monterey Peninsula Water Supply Project desalination product water pipeline.

The Coastal Alignment would continue south, under the Highway 1 overpass, past MRWPCA's Fort Ord Pump Station. The Fort Ord gravity interceptor is farther away from the proposed alignments of both CalAm's Monterey Peninsula Water Supply Project desalination product water pipeline and the GWR product water pipeline than the separation distance required by SWRCB Division of Drinking Water. Hence, pipeline separation distance is not a concern in this area. The pipeline would continue south in the Transportation Agency's land to the Seaside city limit. From this point, the Coastal Alignment would cease to parallel CalAm's Monterey Peninsula Water Supply Project proposed desalination product pipeline alignment. For more information about CalAm's desalination product pipeline, see the relevant California Public Utilities Commission website at: www.cpuc.ca.gov/Environment/info/esa/mpwsp/index.html.

The GWR Project Coastal Alignment would cross under Highway One at the Divarty Street underpass. The pipeline would follow Divarty Street to Second Avenue, where the new Booster Pump Station would be located. This portion of the alignment and the Booster Pump Station site

[28] Use of the MRWPCA easement for the land portion of the ocean outfall alignment was also considered as an option for a portion of the Coastal Alignment of the product water pipeline between the Regional Treatment Plant and Del Monte Boulevard and is discussed and analyzed as a component alternative in Chapter 7, Alternatives to the Proposed Project.

were recommended by the City of Seaside, Fort Ord Reuse Authority, and Marina Coast Water District representatives at a meeting on 13 November 2013. **Figure 2-31, Proposed Booster Pump Station Options,** shows the proposed location of, and conceptual site plan for, the Booster Pump Station for the Coastal Alignment.

From the proposed Booster Pump Station site, the pipeline would turn south and follow on the west side of Second Avenue to Lightfighter Drive within CSUMB property. At the intersection of Second Avenue and Lightfighter Drive the pipeline would be constructed under Lightfighter Drive by either directional drilling or bore and jack techniques to avoid disruption to this main thoroughfare. From this intersection the alignment would turn eastward and would be constructed on the south side of the Lightfighter Drive roadway, but off the pavement, up to the intersection with General Jim Moore. The pipeline would follow the southbound ramp from Lightfighter Drive onto General Jim Moore where it would merge to the same alignment as the RUWAP alignment. **Figure 2-18, Proposed Project Facilities Overview** shows the remainder of the proposed Product Water Pipeline alignment in General Jim Moore to a cut-off route through open space to the Injection Well Facilities site. This portion is coincident with the RUWAP Alignment option.

Booster Pump Station

The proposed new Booster Pump Station would receive flow from the first "leg" of the Product Water Conveyance Pipeline. The product water would flow under pressure to the pump(s) in the Booster Pump Station. The pipeline supplying the Booster Pump Station would have residual pressure (about 5 to 10 psi) available to "prime" the booster pumps. The Booster Pump Station would pump the product water into one of the two proposed alternative alignments that merge to a single alignment along General Jim Moore.

Because of noise considerations, the pump motors and discharge piping would be housed in a split-faced block, or similar building measuring approximately 30 feet by 70 feet and up to 25 feet tall with architectural treatment consistent with nearby facilities subject to approval by the City of Seaside and California State University Monterey Bay. In addition to the pumps and motors, the building would include electrical power equipment and HVAC, instrumentation and control equipment. Maintenance access would be provided to and around the building. Electrical supply transformer and a pressurized surge tank for the pump system would be located outside the pump station building. **Figure 2-31, Proposed Booster Pump Station Options** presents conceptual site plans for the Booster Pump Station for both the RUWAP and Coastal Alignments.

2.9.2 Construction of Product Water Conveyance

2.9.2.1 Pipeline Construction

To implement the Proposed Project, workers would install approximately 10 miles of Product Water pipelines primarily within existing roads and infrastructure easements. Pipeline installation would generally progress by 250 feet per day within or along roadways. For some pipelines in open (undeveloped) areas, work could progress at up to 400 feet per day. Progress at intersections or major utility crossings may be slower. 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. Expected soil haulage quantities are provided in **Table 2-21, Proposed Project Construction Assumptions.**

Under typical circumstances, the width of the disturbance corridor for pipeline construction would vary from 50 to 100 feet, depending on the size of the pipe being installed. Trenchless technologies could require wider corridors at entry and exit pits. Pipeline installation would be ongoing throughout the entire 18-month construction period for the Proposed Project, with multiple pipe segments being installed simultaneously. Pipeline installation would be sequenced to minimize land use disturbance and disruption to the extent possible.

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. In addition, much of the project construction area is underlain by sandy soils that may require a laid-back trench cross-section due to considerations such as duration of construction, efficiency, and safety. In these cases, trench widths may be up to 12 feet wide. Work crews would install trench boxes or shoring or would lay back and bench the slopes to stabilize the pipeline trenches and prevent the walls from collapsing during construction. After excavating the trenches, the contractor would line the trench with pipe bedding (sand or other appropriate material shaped to support the pipeline). Construction workers would then place pipe sections (and pipeline components, where applicable) into the trench, connect the sections together by welding or other applicable joining methods as trenching proceeds, and then backfill the trench. Most pipeline segments would have 4 to 5 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 or public recreation areas. Some pipeline installation would require construction in existing roadways and could result in temporary lane closures or detours.

Trenchless Technologies

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

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

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

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

2.9.2.2 Pump Station Construction

Two pump stations would be constructed: the AWT Product Water Pump Station and the Booster Pump Station (the latter would be located in one of two potential locations based upon the Product Water Conveyance alignment selected, either Coastal or RUWAP). Construction crews would prepare the pump station sites by removing vegetation and grading the sites to create a level work area. Construction activities would include excavations for wet wells, installing shoring and forms, pouring concrete footing for foundations; assembling and installing piping, pumps, and electrical equipment; constructing concrete enclosures and roofs; and finish work such as paving, landscaping, and fencing the perimeter of the pump station sites. Construction access would be provided via existing access roads and roadways.

The AWT Product Water Pump Station would be constructed on a new concrete pad adjacent to the new product water stabilization facilities at the Regional Treatment Plant. It is assumed that the entire 3.5-acre AWT Facility site could be disturbed during project construction activities. Construction of either Booster Pump Station would result in approximately 2,400 square feet of temporary disturbance and permanent facility (including driveways and fenced areas).

2.9.3 Operation and Maintenance

It is assumed that the proposed pump stations and pipelines could operate continuously for up to 24 hours a day. Although pump stations would typically be operated remotely via SCADA, facility operators would conduct routine visits to the pump station sites approximately once daily 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; inspection of valve vaults for leakage; testing, exercising and servicing of valves; vegetation maintenance along rights-of-way; and repairs of minor leaks in buried pipeline joints or segments. Above-grade surge tanks would require periodic inspection (once every five years) and recoating (once every twenty years).

2.10 INJECTION WELL FACILITIES

Under the Proposed Project, product water would be injected into the Seaside Groundwater Basin using new injection wells. The proposed new Injection Well Facilities would be located east of General Jim Moore Boulevard, south of Eucalyptus Road in the City of Seaside, including a total of eight injection wells (four deep injection wells, four vadose zone wells), six monitoring wells, and back-flush facilities. Space would be included within the Injection Well Facilities area to accommodate the future construction of replacement injection wells which would be built only if the adjacent deep injection well fails, which typically would occur after the well's estimated 20 to 30 year life. The proposed site plan for the new injection wells and back-flush facilities are shown in **Figure 2-32, Injection Well Site Plan**.

The proposed new deep injection wells are numbered DIW-1 through DIW-4 and the proposed new vadose zone wells are numbered VZW-1 through VZW-4, going from north to south, in the order of anticipated sequence for construction of the wells. DIW-1 and VZW-1 would be built in close proximity to each other to share electrical, motor control, pumps, and site building pad infrastructure. Similarly, DIW-2 and VZW-2, would be constructed in close proximity to one another, as would each successive pair of wells. Each site is referred to as a well cluster. Each well cluster would include concrete pads at each well head, approximately 10-ft by 10-ft, a back-flushing pump and motors for the deep well, above and below grade injection and back-flush wash pipelines, valves and flow meters, and a small building (approximately 16-ft by 24-ft) to hold the electrical and control equipment in a fenced area measuring up to 7,000 square feet. Suitable paint colors, materials, and screening landscape around each fenced enclosure would be provided subject to approval of the City of Seaside. **Figure 2-33, Injection Well Cross-Section,** shows a cross-section of the proposed injection wells in relation to the groundwater basins and other facilities. **Figure 2-34, Conceptual Injection Schematic,** shows the relationship between the proposed and existing facilities, underground water flow paths, and the groundwater basin. **Figure 2-35, Conceptual Site Plan and Schematic of Typical Well Cluster,** is an example of the details of one of the four proposed well clusters.

2.10.1 Design of Injection Well Facilities

2.10.1.1 Injection Wells

Wells within the same target aquifer are proposed to be spaced from 800 to 1,000 feet apart to minimize well interference. Separate turnouts with isolation valves would be provided to each individual well site from the product water conveyance pipeline. Proceeding southwesterly, the pipeline would step down in size after the third well. Each deep injection well would have an isolation valve, flow meter and an air release shutoff valve at the well head to prevent air from entering the well during injection operations.

Four deep injection wells and four vadose zone wells are proposed so that the product water could readily be allocated among the two well types and aquifers. With water levels below sea level in both the Paso Robles Aquifer, the uppermost aquifer that is unconfined, and the Santa Margarita Aquifer, the deeper confined aquifer, it has been determined by the Watermaster that recharge into both aquifers would be beneficial for protection against seawater intrusion and for water supply. However, most of the basin production is from the Santa Margarita aquifer where water levels are below sea level throughout the northern coastal subarea and more than 40 to 60 feet below sea level down-gradient and adjacent to the Injection Well Facilities site (see

Figure 2-4, Seaside Groundwater Basin Groundwater Levels). Groundwater modeling was performed to identify the optimal allocation of recharge to the two aquifers to minimize both: (1) water outflow from the basin, and (2) changes in storage in the basin (Hydrometrics WRI, 2013).

Based on the modeling performed for the Proposed Project, the Santa Margarita aquifer is targeted to receive 90% of the product water from the Project and the Paso Robles aquifer is targeted to receive 10% of the product water. Injection to the Paso Robles aquifer would be through vadose zone wells (relatively shallow and less expensive to construct and operate than deep injection wells). This project configuration would provide maximum flexibility for well operation and for managing short-term production benefits with the benefits of long-term storage.

Deep injection well design capacity (or maximum volumetric flowrate of water that can be injected in the well for a short period) is conservatively estimated at 1,000 gpm, based on nearby Aquifer Storage and Recovery wells operated by Water Management District (see **Figure 2-17, Aquifer Storage and Recovery Project Location Map** for location of Aquifer Storage and Recovery wells). Using an additional conservative factor of 80% capacity to account for occasional time offline for maintenance (including well back-flushing), four wells would have an operational injection capacity of about 3,200 gpm of water. A preliminary design for the deep injection wells is shown on **Figure 2-36, Deep Injection Well Preliminary Design;** this design is based on the design and functional capability of the nearby Santa Margarita Aquifer Storage and Recovery wells.

Vadose zone well capacity is less certain, but a preliminary analysis by Todd Groundwater indicates that 500 gpm would be a reasonable estimate of capacity (Todd Groundwater, 2015). Using this estimated rate, a total of four vadose zone wells would provide an additional capacity of about 2,000 gpm. A conceptual vadose well diagram is shown on **Figure 2-37, Vadose Zone Well Preliminary Design.** The design is based, in part, on details provided by the City of Scottsdale, Arizona, where several hundred similar vadose zone wells have been successfully operated for many years.

Collectively, the four shallow and four deep injection wells represent a maximum injection capacity of about 6,000 gpm. This capacity is well above the Proposed Project design flows of 3,700 AFY (with an anticipated maximum daily flow rate of 2,780 gpm with no downtime), and thus would allow for backup of pumping capacity if one or more wells are not functioning, well maintenance, and other operational benefits. In addition, GWR product water could readily be re-allocated among the two well types and aquifers as basin conditions change in the future and to ensure compliance with SWRCB Division of Drinking Water requirements (i.e., response retention time).[29] In addition, if there are future changes in the daily flow rates, sufficient number and total capacities of wells would be available to accommodate peak flows. Wells may be installed in a phased approach (from north to south) as actual well capacity and required peak flow rates are more clearly defined. This EIR assumes all eight injection wells would be built.

2.10.1.2 Back-flush Facilities

Over time, injection well capacity can decrease because of several factors, including air entrainment, filtration of suspended or organic material, bacterial growth, and other factors. To

[29] This concept is defined in more detail in **Chapter 3, Water Quality Permitting and Regulatory Overview.**

regain "lost capacity," the deep injection wells are planned to be pumped periodically, a process referred to as back-flushing. For back-flushing, wells are usually pumped at an extraction rate that is twice the injection rate. Each deep injection well would be equipped with a well pump to back-flush the well. The back-flushing rate would be approximately 2,000 gallons per minute (gpm) and would require a well pump and motor. Pump speed would be variable by inclusion of a variable frequency drive, so that back-flushing can be ramped up (manually or with an automated program) from initial lower flow to full flow. The shallow vadose zone wells would not be equipped with back-flushing pumps as the bottom of those wells would be over one hundred feet above the aquifer.

Based on the experience of the Water Management District in the operation of its nearby Aquifer Storage and Recovery wells, back-flushing of each deep injection well would occur about weekly and would require discharge of the back-flush water to a percolation basin (basin), with a storage capacity of about 240,000 gallons. Water percolated through the basin would recharge the Paso Robles aquifer. **Figure 2-32, Injection Well Site Plan** shows the proposed basin in the middle of the injection well facilities site. The operational size of the basin would be approximately 50-feet wide by 180-feet long by 3-feet of water depth. The overall basin depth would be five feet (three feet water depth plus two feet free board). The embankment of the basin would have 3:1 side slopes and 12-foot wide perimeter access road. The basin would be located in an area between the middle two injection well clusters.

Each well would have a flow meter to monitor the amount of water applied for recharge. A separate pipeline would measure rate of flow and convey the back-flushed water to the Basin. Each deep injection well would have a back-flush pump and motor. The estimated motor size for each pump is approximately 400 hp. Electrical cabinets would be located at each well for electrical supply, monitoring and supervisory control and data acquisition (SCADA) connections.

2.10.1.3 Monitoring Wells

Monitoring wells would be used to monitor project performance and compliance with State Board Division of Drinking Water regulations. Because the Proposed Project would recharge two separate aquifers (Paso Robles and Santa Margarita aquifers), monitoring wells would be installed in both. The monitoring wells would also be used to satisfy regulatory requirements for monitoring of subsurface travel time, tracer testing, and other requirements for a groundwater replenishment project. Based on current State Board regulations, a minimum of four monitoring wells would be required: two for each of the two aquifers. One set of monitoring wells would be located approximately 100 feet from the injection wells between the injection wells and the nearest down-gradient water supply wells. The second set of monitoring wells would be located between the project wells and the nearest down-gradient water supply wells. **Figure 2-32, Injection Well Site Plan** shows the approximate location of the monitoring wells.

2.10.1.4 Electrical Power Supply and Instrumentation for Injection Wells

Injection wells would require a new permanent power supply to the site, including electrical equipment, electrical control buildings for back-flush pumps, external electrical control cabinets at the well clusters, wiring and connections of electrical power and instrumentation and control facilities. Power supply capability by the utility company, PG&E, must be confirmed prior to final design of the electrical power supply facilities. There are high-voltage (21 kV) overhead power lines in close proximity to the Injection Well Facilities Site; therefore, it is likely that the PG&E power at 4.16 kV would be brought to each cluster site from offsite overhead power poles. However, the locations for connections and conveyance are unknown at this time. From this location, the power line would likely be in a buried conduit, encased in concrete, routed to the locations of the power demand, namely near the motor control and electrical building at each of the four well sites (discussed in **Section 2.10.1.1** above) The proposed electrical control buildings would each house the SCADA and electrical controls and pump drive and adjacent to each building would be a transformer (approximately 400 to 450 kVA), located such that it would step down the line voltage from 4.16 kV to 3-phase, 60 Hz, 480-volt power for the well pumps. Further step down from 480-volt to 220 and 120 volt would be required for power supply to instrumentation and SCADA equipment, site lighting, building lighting and ventilation and other small, miscellaneous needs. In addition to incidental power requirements (instrumentation and monitoring equipment, site lighting, isolation valve motor operators, etc.), major power supply would be required to drive only one back-flush pump motor at a time.

Step-down transformers would be outdoor type units located near the electrical buildings. Adequate clearance would be provided around the transformer to meet electrical code requirements.

An electrical building would house the motor control center and variable frequency drive unit at each cluster site and would be located near the transformer. The electrical building would measure approximately 400 square feet and would be up to 15 feet tall. The material of construction would be brick-faced concrete block with architectural treatment of the buildings subject to review and approval by the City of Seaside.

2.10.2 Construction

2.10.2.1 Well Construction

Installation of any of the wells (deep injection, vadose zone and monitoring wells) typically follows a three-step process: drilling and logging, installation, and testing and equipping. This section describes these three processes.

Drilling and Logging

The deep injection well would be drilled with rotary drilling methods. The method would be customized to minimize borehole impacts from drilling fluids and may incorporate air rotary methods or specialized drilling fluids (such as polymers). Cuttings from the borehole would be logged by a California Certified Hydrogeologist. Open-hole geophysical logging would also be conducted.

It is anticipated that one of the deeper, Santa Margarita monitoring wells would be installed prior to the installation of the first deep injection well. This would provide site-specific information and inform details of injection well design. The well would also provide a critical monitoring point during injection well testing. The direct rotary drilling method would likely be used for the monitoring wells.

Installation

The deep injection well design would be based on the Aquifer Storage and Recovery wellfield design and would incorporate 18-inch to 20-inch diameter production casing and a wire-wrap stainless steel screen. Based on downhole velocity logs completed following construction of the downgradient Aquifer Storage and Recovery project wells and the first GWR monitoring well north of the proposed Injection Well Facilities, the lower 200 feet of the aquifer has been found to be the most productive section of the Santa Margarita and would be targeted for the injection zone screen. Screen selection and filter pack design would be developed using both cuttings from the adjacent monitoring well (to be drilled as part of the Proposed Project) in addition to data collected from nearby Aquifer Storage and Recovery wells. Mechanical and pumping techniques would be used to develop the well after installation.

Testing and Equipping

Both constant discharge and constant injection testing would be completed in the injection well following well drilling. Test details have not yet been developed but an 8-hour test for each test is assumed. Constant rate tests would be preceded by step tests, as appropriate, to identify preferred rates for each test. Flowmeter surveys would be conducted following pumping and injection testing to identify water movement within the wellbore. Depending on the objectives of the test, both static and dynamic flow testing may be recommended.

At the end of the constant rate discharge test, a water quality sample would be collected to confirm local groundwater quality. Constituents targeted for analysis would be based on compliance with the Drinking Water regulations and Engineering Report as well as ambient groundwater quality in the Santa Margarita aquifer in the area. The Aquifer Storage and Recovery wells had some power constraints from PG&E and incorporated a 400-horsepower, variable speed pump. For planning and cost purposes, a similar pump is envisioned for each proposed deep injection well.

2.10.2.2 Back-flush Pipeline Facilities Construction

As described above, the back-flush facilities at each injection well site would include a flow meter, a back-flush pump and 400-hp motor, and an electrical cabinet, monitoring and SCADA. A main electrical power supply/transformer and motor control building would be built for PG&E power supply. In addition to incidental power requirements (instrumentation and monitoring equipment, site lighting, etc.), major power supply would be required to drive only one injection pump motor at a time. To construct the back-flush pipeline and basin, the contractor would excavate pipe trenches, retain the spoilage on site, import and install bedding material, and lay pipe, backfill & compact trench.

Estimated construction time for this component is approximately 4 months. The temporary construction area along the alignment of the 14-inch diameter back-flush water pipeline would be approximately 25 to 50 feet wide, for its approximate 3,000-foot length. Hence, the ground surface disturbance area would be between 1.75 and 3.5 acres. The construction area width is to provide space for a backhoe, trucks for hauling excess soil material and imported bedding material. The depth of the pipeline trench would be approximately five feet to allow for bedding of the pipe and about three to four feet of cover material.

2.10.2.3 Pump Motor Control/Electrical Conveyance Construction

A main electrical power supply/transformer and motor control building would be built at each injection well facility site for PG&E power supply. In addition to incidental power requirements (instrumentation and monitoring equipment, site lighting, etc.), major power supply would be required to drive only one injection pump motor at a time. The following activities would be required to construct the pump motor control and electrical conveyance facilities:

- excavation, spoilage handling, import and install bedding material, building foundation, trench, place concrete, backfill & compact trench, finish concrete floor of electrical building;

- install exterior electrical control cabinets on the paved area at the four clusters of vadose and deep injection wells; and
- for electrical buildings, construct block walls, doors, louvers, roof and appurtenances, then interior finishes, lighting and HVAC; and electrical equipment and wiring.

The estimated construction period for these facilities is approximately 6 months. The temporary construction area would be approximately 25 to 50 feet wide within the alignment of the 14-inch diameter back-flush water pipeline, which is approximately 3,000 feet long.). There would be no additional surface disturbance beyond that for the 14-inch back-flush water pipeline, described in the previous section. Construction activities would include a buried electrical power conduit and instrumentation conduits, all of which would be underground and encased in a concrete ductbank, which would run in parallel and near the 14-inch back-flush pipeline. The depth of the ductbank trench would be approximately 4.5 to 5 feet to allow for about 3 feet of cover material. The electrical control building that would house the electrical and instrumentation (SCADA) transmission equipment would be approximately 16 feet by 24 feet. Its foundation construction would be slab-on-grade; hence, excavation would be only about 3 feet deep. The construction surface area would be about 600 square feet.

2.10.3 Operation and Maintenance

Injection wells and associated electrical and mechanical systems would operate 24 hour per day, 7 days per week throughout the year, although it is unlikely that all eight wells would be actively injecting at the same time for any length of time. Operations and maintenance staff would visit the Injection Well Facilities site most likely once daily Monday through Friday nearly every week. In addition to operation and maintenance of the wells, the workers would inspect above ground valves and appurtenances to assure they are properly functioning and to conduct and monitor the back-flush operations.

For the purposes of evaluating the injection impacts on groundwater basin, MRWPCA has evaluated the availability and amounts of source waters, capacity of the AWT Facility, minimum delivery targets, and operational guidelines in order to develop potential delivery schedules for recharge to the Seaside Basin. Based on this analysis, there are eight potential delivery schedules that could occur, based on two water management decision points made in each year of GWR operation. These eight delivery schedules were presented in **Table 2-9, Proposed Project Monthly Flows for Various Flow Scenarios.** The two management decisions that determine appropriate deliveries to the Seaside Basin are described below.

The first management decision would be made by October 1, the beginning of the water year,[30] and would dictate which of two delivery schedules is followed during October through March of that water year. The decision would be based on whether or not the drought reserve account is full. If the account is full (1,000 AF), the project would deliver monthly amounts from October through March based on average annual deliveries (highlighted in purple on **Table 2-9, Proposed Project Monthly Flows for Various Flow Scenarios**; for example, see October through March deliveries for Schedule 2 and Schedule 8). If the account balance is 800 AF of less on October 1, then an additional 200 AF would be delivered from October through March (highlighted on **Table 2-9, Proposed Project Monthly Flows for Various Flow Scenarios** in

[30] A Water Year is defined as October 1 through September 30, and is based on the annual precipitation pattern in California. The Water Year is designated by the calendar year in which it ends.

blue; for example, see October through March delivery schedules 1, and 3 through 7). For wet or normal years, these two recharge schedules would produce a total of 3,700 AFY (Schedule 1) or a total of 3,500 AFY (Schedule 2) (**Table 2-9, Proposed Project Monthly Flows for Various Flow Scenarios**).

Based on the experience of the Water Management District in the operation of its nearby Aquifer Storage and Recovery wells, back-flushing of each injection well would occur for about four hours weekly and would require discharge of the back-flush water to the percolation basin. The Water Management District conducts manual back-flushing and visual checks and field-tests the back-flush water discharge to confirm adequate flushing time has been provided. Approximately once per year, a disking machine would be used to scarify the bottom of the pond to increase/restore the percolation rate.

Monitoring wells would be used to monitor project performance and compliance with State Board – Drinking Water Division regulations. Because the Proposed Project would recharge two separate aquifers (Paso Robles and Santa Margarita Aquifers), monitoring wells would be sampled to satisfy regulatory requirements for monitoring of subsurface travel time, tracer testing, and other requirements for a groundwater replenishment project.

2.11 CALAM DISTRIBUTION SYSTEM

CalAm would use existing Seaside Groundwater Basin wells, in addition to existing treatment facilities and existing pipelines in its Monterey District Service area, to recover, treat and deliver potable water from the Seaside Groundwater Basin to its customers; the water that CalAm extracts would include some of the Proposed Project product water along with other groundwater from the Basin.

In addition to using existing wells, treatment facilities, and pipelines, CalAm would need to construct additional pipeline segments to deliver the full amount of product water to its customers. Because the CalAm system was initially built to deliver water from Carmel Valley to the Monterey Peninsula cities, a hydraulic trough currently exists in the CalAm peninsula distribution system that prevents water delivery at adequate quantities from the Seaside Groundwater Basin to most of Monterey, and all of Pacific Grove, Pebble Beach, Carmel Valley, and the City of Carmel areas. The hydraulic trough is an area of the CalAm distribution system with very small pipe diameters and very low elevation such that the required high flow rates of water and high pressures needed to convey water from the north between two pressure zones of the system cannot be achieved with the current infrastructure. This system deficiency would need to be addressed regardless of whether the Proposed GWR Project is implemented by itself, CalAm's Monterey Peninsula Water Supply Project with the full-size desalination plant is implemented without the GWR Project, or the variant to the Monterey Peninsula Water Supply Project that includes both a smaller desalination plant and the GWR Project is implemented. Under all three of these scenarios, for CalAm to be able to deliver increased quantities of water extracted from the Seaside Groundwater Basin to its customers, the company would need to construct pipeline improvements to bridge this trough. In CalAm's Monterey Peninsula Water Supply Project, CalAm is proposing to construct two new pipelines--the Transfer and Monterey pipelines--to bridge this trough. In addition, CalAm is proposing to construct a new Terminal Reservoir to add storage and pressure equalization within the water supply system; however, MRWPCA understands that the Terminal Reservoir would not be needed if the GWR Project is implemented by itself. Therefore, the Transfer and Monterey Pipelines are the only CalAm

Distribution System components proposed to be built by CalAm and included in the analysis of impacts of the Proposed Project.

While MRWPCA would not be approving, constructing or operating the CalAm distribution improvements, the improvements would be needed for a stand-alone GWR Project, and therefore they are included in the environmental evaluation of the Proposed GWR Project. These same CalAm improvements are also included in the Monterey Peninsula Water Supply Project as a component of that project. The proposed alignment of these pipelines is shown in **Figures 2-38, CalAm Distribution System Pipeline: Eastern Terminus**, and **2-39, CalAm Distribution System Pipeline: Western Terminus**.[31]

2.11.1 Transfer Pipeline

The new three-mile-long, 36-inch-diameter Transfer Pipeline would allow for flows to be conveyed in either direction and would be used to convey potable water extracted from the Seaside Groundwater Basin to CalAm customers by conveying the water to the Monterey Pipeline.[32] From the intersection of Del Monte Boulevard/La Salle Avenue, the proposed Transfer Pipeline would be routed east along La Salle Avenue for approximately 0.9 mile to Yosemite Street, turn south and continue for approximately 1 mile to Hilby Avenue, and then continue east for approximately 0.4 mile along Hilby Avenue to General Jim Moore Blvd (see **Figure 2-38, CalAm Distribution System Pipeline: Eastern Terminus**).

2.11.2 Monterey Pipeline

The new 5.4-mile-long, 36-inch-diameter Monterey Pipeline would allow for bi-directional flows and would convey potable water supplies from the new Transfer Pipeline to the Monterey Peninsula. The Monterey Pipeline would utilize the pressure (called "hydraulic head") provided by CalAm extraction operations to convey water to the Monterey Peninsula cities. The Monterey Pipeline would connect two pressure zones in the CalAm system (one in the area of the City of Pacific Grove and one in the area of the City of Seaside). With implementation of this pipeline, water stored in Forest Lake Tanks could flow via gravity to the lower Carmel Valley or be pumped to the upper Carmel Valley.

The eastern terminus of the new Monterey Pipeline would be connected to the new Transfer Pipeline[33] at the intersection of Del Monte Boulevard/La Salle Avenue. The Monterey Pipeline would be routed southwest on the west side of Del Monte Boulevard, generally following the Monterey Peninsula Recreational Trail and Transportation Agency right-of-way. The alignment would pass under Highway 1, and adjacent to the Naval Postgraduate School and El Estero Park. East of El Estero Park, the pipeline would turn south on Figueroa Street and west along

[31] Alternative routes for the Monterey and Transfer Pipelines have been submitted to the California Public Utilities Commission by CalAm. The alternative routes are addressed in this EIR within Chapter 7, Alternatives to the Proposed Project.

[32] If the Monterey Peninsula Water Supply Project is approved and implemented, the Transfer pipeline would also be used to: convey desalinated product water from the Transfer Pipeline east to the Terminal Reservoir for storage; convey Aquifer Storage and Recovery product water west to the Monterey Pipeline; and convey water stored in the Terminal Reservoir west to the Monterey Pipeline.

[33] In the case of the proposed Monterey Peninsula Water Supply Project, the Monterey Pipeline would also connect with the Transmission Main at this location.

Franklin Street. At High Street, the alignment would bear north and traverse the Presidio of Monterey by paralleling an existing CalAm pipeline in an existing CalAm easement. At the western boundary of the Presidio of Monterey, the alignment would continue on to Spencer Street. The alignment would then turn from Spencer Street southwest on Eardley Street and terminate near the existing Eardley Pump Station (see **Figure 2-39, CalAm Distribution System Pipeline: Western Terminus**).

2.11.3 Construction of CalAm Extraction / Distribution System

Construction of CalAm's Transfer Pipeline and Monterey Pipeline would use similar equipment and methods as those described in **Section 2.9.2** for the Product Water Conveyance Pipeline, and are omitted here for brevity. Pipeline installation would generally progress at a rate of 150 to 250 feet per day. The Transfer Pipeline construction is anticipated to take 6-months, and construction of the Monterey Pipeline is anticipated to take 12-months. Construction of the pipelines may be performed concurrently under one or separate contracts.

2.11.4 Operation of CalAm Extraction / Distribution System

Unlike the injection period for Aquifer Storage and Recovery supplies, which is limited to periods of high flow between December and May in the lower stretches of the Carmel River, GWR product water would be injected into the Seaside Groundwater Basin year-round. GWR product water would typically be pumped from the groundwater basin during summer months and periods of peak demand. Operation of the existing Aquifer Storage and Recovery wells and groundwater wells for extraction and delivery of GWR Project water from the Seaside Groundwater Basin would match the current CalAm operational practices.

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

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

2.12 PROPOSED PROJECT CONSTRUCTION SUMMARY

The Proposed Project construction activities would include site preparation, grading, and excavation; pavement demolition; concrete and paving; installation of prefabricated components (e.g., pretreatment and advanced treatment processes, storage tanks, etc.); construction of buildings to house electrical, pump motors, and chemicals; construction of pipelines; well drilling and development; installation of overhead and underground powerlines; and disposal of construction waste and debris. Construction equipment and materials associated with the various components of the Proposed Project would be staged and stored within the respective construction work areas. Construction equipment and materials associated with pipeline installation would be stored along the pipeline alignments and at nearby designated staging areas. Staging areas would not be sited in sensitive areas such as riparian areas or critical habitat for protected species. To the extent feasible, parking for construction equipment and worker vehicles would be accommodated within the construction work areas and on adjacent roadways.

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

A preliminary construction schedule is provided in **Figure 2-40, Proposed Project Construction Schedule** to show the general timeframes, durations, and overlap of construction activities of the various components of the Proposed Project. As shown, the Proposed Project is anticipated to require approximately 18 months to construct, plus 3-months of testing and start-up, and is planned for initial operation by late 2017. MRWPCA is currently evaluating the use of alternative construction approaches, such as design-build, to expedite the construction schedule. **Table 2-20, Construction Area of Disturbance and Permanent Footprint** summarizes the construction areas of disturbance and permanent footprint for each of the Proposed Project construction sites. General construction activities, equipment, and hours are summarized in **Table 2-21, Proposed Project Construction Assumptions**. In the sections following the table, the construction activities at each site are described in more detail.

Table 2-20
Construction Area of Disturbance and Permanent Footprint

Project Component	Construction Boundary (feet)		Permanent Component Footprint (feet)			
	Length	Width	Length	Width	Maximum Height (above ground surface)	Maximum Depth (below ground surface)
Source Water Diversion and Storage Sites						
Salinas Pump Station Diversion (several discrete trenches and pits totaling 0.75 acres)	175	175	30	25	0	20
Salinas Treatment Facility Storage and Recovery						
Recovery Pump Station	50	50	30	15	10	10
Recovery Pipeline (Note 1)	500	20	7,700	<6	0	10
Pond 3 pump station and inlet structure	50	50	15	30	10	20
Pipeline from Pond 3	6,000	20	6,000	<6	0	10
Reclamation Ditch Diversion	120	50	80	20	10	20
Tembladero Slough Diversion	200	50	50	20	10	20
Blanco Drain Diversion						10 (trenched sections); 25 (trenchless sections and pits)
Diversion Pump Station	50	50	50	20	10	
Force Main and Gravity Pipeline (including pipelines located at the Regional Treatment Plant)	8,500	20	8,500	<6	0	
Lake El Estero Diversion	50	50	20	2	0	15
Treatment Facilities at Regional Treatment Plant						
AWT Facility	600	450	500 (triangular)	350	31	10
Brine Mixing Facility					16	31

Table 2-20
Construction Area of Disturbance and Permanent Footprint

Project Component	Construction Boundary (feet)		Permanent Component Footprint (feet)			
	Length	Width	Length	Width	Maximum Height (above ground surface)	Maximum Depth (below ground surface)
Pipelines, AWT product water pump station					0	15
Salinas Valley Reclamation Plant modifications	700	400	600	300	25	10
Salinas Valley Reclamation Plant pipeline	900	20	900	<6	0	10
Product Water Conveyance Facilities						
Product Water Pipelines (Note 2)						10 (trenched sections); 25 (trenchless sections and pits)
RUWAP AWT to Booster Pump Station	*28,000*	*10 – 15*	*28,000*	*<6*	*0*	
RUWAP Booster Pump Station to Injection Wells	*18,900*	*10 – 15*	*18,900*	*<6*	*0*	
Coastal AWT Facility to Booster Pump Station	*29,100*	*10 – 15*	*29,100*	*<6*	*0*	
Coastal Booster Pump Station to Injection Wells	*15,100*	*10 - 15*	*15,100*	*<6*	*0*	
Booster Pump Station (one of two optional sites)	*100*	*60*	*80*	*60*	*25*	10
Project Component	**Construction Boundary (feet)**		**Permanent Component Footprint (feet)**			
	Length	**Width**	**Length**	**Width**	**Maximum Height (above ground surface)**	**Maximum Depth (below ground surface)**
Injection Well Facilities						
Well cluster, including: one Deep Injection Well, one Vadose Zone Well, motor control building, transformer, and space for replacement wells (4)	100	100	85	90	15	1,050 (Deep) 600 (Vadose)
Back-flush basin	280	150	225	125	2-3 for pipe outlet only	10
Monitoring wells, including: up to six well clusters with two wells at each site (6)	100	100	3	3	0	900
Access Roads to Injection Wells, including: underground pipeline & electrical	4200	40	4200	20	0	10
Electrical conduit along Eucalyptus Rd.	1200	10	1200	3	0	6
Access roads to monitoring wells	1000	20	1000	10	0	2
CalAm Distribution System Improvements						
Transfer Pipeline	13,000	30–80	13,000	Note 3	0	15 (trenched sections); 25 (trenchless sections, pits)
Monterey Pipeline	28,700	30–80	28,700	Note 3	0	

Note 1: The existing 33-inch industrial wastewater conveyance pipeline would be slip-lined with the new 18-inch recovery pipeline. This would require the excavation of up to 12 sending/receiving pits measuring approximately 60-feet long by up to 20-feet wide.
Note 2: The Product Water Conveyance Pipeline between the Regional Treatment Plant and the General Jim Moore Boulevard /Lightfighter Rd intersection would be built within either the RUWAP or the Coastal Alignment, not both.
Note 3: Pipeline trenches would generally be no more than seven (7) feet wide, except in areas with sandy soils and lack of constraints to a wider trench. Constraints include known sensitive or protected resources, geography such as steep slopes, existing utilities, buildings, or other facilities that restrict the construction area. A trench section with a ground surface width of up to approximately 10 to 15 feet would be potentially used in some soil types to increase efficiencies related to shoring the trench.

Table 2-21
Proposed Project Construction Assumptions

Project Component	Excess Spoils/Debris to Off-Haul (cubic yards)	Construction Equipment (see Appendix E. Air Quality and Greenhouse Gas Technical Analysis for more details)	Construction Shifts and Work Hours (see Table 4.17-4 in Section 4.17, Traffic and Transportation, for assumed construction worker and truck trip information)
Source Water Diversion and Storage Sites			
Salinas Pump Station Diversion 1) wet well/diversion structures (up to 4) 2) pipelines totaling 100 linear feet 3) electrical/SCADA box	100	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	Two daytime shifts: Shift 1 from 7 AM to 3 PM and Shift 2 from 12 PM to 8 PM Monday through Saturday; some workers may have to be on-site at night to ensure continual operations of the wastewater conveyance facilities.
Salinas Treatment Facility Storage and Recovery Recovery Pump Station, flow meter and valves, electrical/SCADA cabinet, approximately 7,700 linear feet of pipeline from the site to Salinas Pump Station site, inlet pump station at Pond 3, approximately 6,000 linear feet of pipeline from Pond 3 to recovery pump station, approximately 50 linear feet of gravity pipeline from aeration basin to connect with pipeline from Pond 3 to recovery pump station	1,200	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, skip loader, pavers and rollers, directional drilling equipment	Two daytime shifts: Shift from 7 AM to 3 PM and Shift 2 from 12 PM to 8 PM Monday through Saturday
Reclamation Ditch Diversion 1) wet well/diversion structure 2) flow meter, valves and approximately 60 linear feet of pipelines 3) electrical/SCADA cabinet 4) concrete lining of channel banks and invert at intake	20	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	One daytime shift from 7 AM -6 PM Monday through Saturday
Tembladero Slough Diversion 1) wet well/diversion structure 2) flow meter, valves and approximately 100 linear feet of pipelines 3) electrical/SCADA cabinet 4) concrete lining of channel banks and invert at intake	20	Same as above, plus crane and vibratory driver for cofferdam to work within the tidal portion of the Tembladero Slough	One daytime shift from 7 AM to 6 PM Monday through Saturday
Blanco Drain Diversion 1) wet well/diversion structure 2) flow meter, valves and on-site surge tank 3) electrical/SCADA cabinet 4) concrete lining of channel banks and invert at intake 5) approximately 8,500 linear feet of force main and gravity pipeline from the site to the Regional Treatment Plant	1,500	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, directional drilling equipment	One daytime shift: from 7 AM to 6 PM Monday through Saturday).

Table 2-21
Proposed Project Construction Assumptions

Project Component	Excess Spoils/Debris to Off-Haul (cubic yards)	Construction Equipment (see Appendix E. Air Quality and Greenhouse Gas Technical Analysis for more details)	Construction Shifts and Work Hours (see Table 4.17-4 in Section 4.17, Traffic and Transportation, for assumed construction worker and truck trip information)
Lake El Estero Diversion pipeline, valves, flow meters, and new pumps in existing pump station at the northwest corner of lake and,	10	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	Two daytime shifts: Shift 1 from 7 AM to 3 PM and Shift 2 from 12 PM to 8 PM Monday through Saturday.
Treatment Facilities at the Regional Treatment Plant			
AWT Facility Inlet source water diversion structure and influent pump station to bring secondary effluent AWT Facility, prescreening, ozonation, upflow biologically active filtration (optional), chemical addition, membrane filtration treatment, booster pumping of the membrane filtration filtrate (potentially with intermediate storage), cartridge filtration (optional), chemical addition, reverse osmosis membrane treatment, advanced oxidation using ultraviolet light and hydrogen peroxide (advanced oxidation), decarbonation (optional), product-water stabilization with calcium, alkalinity and pH adjustment, product water pump station (AWT Pump Station), brine mixing facilities.	510	Excavators, backhoes, air compressors, loaders, boom trucks, cranes, pavers and rollers, concrete transport trucks, concrete pump trucks, flatbed trucks, generators, pickup trucks, trucks for materials delivery	Up to four (4) shifts with construction occurring 24-hours per day, 7 days per week
Salinas Valley Reclamation Plant Modifications New sluice gates, chlorination basin upgrades, a new platform in the 80AF pond and a pipeline connecting the existing inlet and outlet structures in the 80AF pond.	150	Flatbed trucks; backhoes; pipe cutting and welding equipment; trucks for materials delivery; compaction equipment; pickup trucks; arc welding machine; generators; air compressors; skip loader, specialty equipment for cutting and seaming the pond liner	One daytime shift from 7 AM to 6 PM Monday through Saturday). Pipeline installation would occur during the winter months when the 80 AF pond is dewatered.
Product Water Conveyance (Either RUWAP or Coastal would be built, but not both. The product water pump station at the AWT/Regional Treatment Plant is included above)			
RUWAP Pipeline Alignment		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	**RUWAP Pipeline Alignment**
Regional Treatment Plant to Booster Pump Station	5,090		Two daytime shifts: Shift 1 from 7 AM to 3 PM and Shift 2 from 12 PM to 8 PM Monday through Saturday
Booster Pump Station to Injection Well Facilities	3,580		
Coastal Pipeline Alignment			**Coastal Pipeline Alignment**
Regional Treatment Plant to Booster Pump Station	5,290		Two daytime shifts: Shift 1 from 7 AM to 3 PM and Shift 2 from 12 PM to 8 PM Monday through Saturday
Booster Pump Station to Injection Well Facilities	2,890		
Booster Pump Station	180	Excavator, backhoe, air compressor, boom	Two daytime shifts, Shift 1 from 7 AM to

Table 2-21
Proposed Project Construction Assumptions

Project Component	Excess Spoils/Debris to Off-Haul (cubic yards)	Construction Equipment (see Appendix E. Air Quality and Greenhouse Gas Technical Analysis for more details)	Construction Shifts and Work Hours (see Table 4.17-4 in Section 4.17, Traffic and Transportation, for assumed construction worker and truck trip information)
(applies to either Coastal or RUWAP alignment option location)		truck or small crane, generator, concrete pump truck, paving equipment, flatbed truck, pavers and rollers, welding equipment, baker tank	3 PM and Shift 2 from 12 PM to 8 PM Monday through Saturday
Injection Well Facilities			
1) Deep Injection Wells (4) 2) Vadose Zone Wells (4) 3) Monitoring Wells (12)	600 320 320	Loader backhoe, bucket auger drill rig, reverse rotary rig, forklift (reverse rotary support), truck-mounted pump rig, generator, concrete delivery and pumper trucks	Up to four shifts because construction would occur for up to 24-hour/day, 7 days/week
Back-flush Water Pipeline and Basin	4,000	Tractor/loader/backhoe, excavators, dumper trucks, rubber tired dozers	
Roadways, pipelines and electrical conduit	3,500		
Proposed Project Total Excess Construction Spoils (without CalAm Distribution System Pipelines)	21,080	See above	Overall Construction Schedule: mid summer 2016 through Mar. 2018, including 3 months of testing/start-up
Cal-Am Distribution System Pipelines			
a) Monterey Pipeline b) Transfer Pipeline	a) 10,680 b) 3,330	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	To the extent feasible, pipeline installation and associated construction activities would occur during daytime hours (with some nighttime construction at certain locations to expedite pipeline installation schedule)
CalAm Total Excess Spoils and Debris	Approx. 14,010		Monterey and Transfer Pipelines proposed construction Schedule July 2016 to December 2017 (18 months)
Combined Excess Spoils and Debris to Off-Haul	35,090 cubic yards		

2.13 PERMITS AND APPROVALS

This EIR is intended to inform decision-makers of the environmental consequences associated with implementation of the Proposed Project. In addition, the Proposed Project would be subject to various regulations and would require discretionary permits from federal, state, and local jurisdictions. **Table 2-22, List of Permits and Authorizations** lists the permits and authorizations that would likely be required to construct, operate, and maintain the Proposed Project.

Table 2-22
List of Permits and Authorizations

Agency /Entity	Permitting Regulation/Approval Requirement	Discussion
Federal Agencies		
U.S. Environmental Protection Agency (EPA)	Class V Underground Injection Control Program (Part C, Safe Drinking Water Act) Registration	The EPA Underground Injection Control program requires, at a minimum, that the disposed fluid will not endanger the groundwater and that the operator submit the proper inventory information to the permitting authority.
Monterey Bay National Marine Sanctuary (MBNMS)	Review and coordination of all Regional Water Quality Control Board (RWQCB) 404, Section 10, and National Pollutant Discharge Elimination System permits	Authorization by the Monterey Bay National Marine Sanctuary's superintendent is required for any permit, lease, license, approval, or other authorization issued or granted by a federal, state, or local agency for activities within the sanctuary. This authorization indicates that the Monterey Bay National Marine Sanctuary Advisory Council does not object to issuance of the permit or other authorization, including the terms and conditions deemed necessary to protect sanctuary resources and qualities.
U.S. Fish and Wildlife Service (USFWS)	Endangered Species Act (ESA) compliance Section 7 consultation	MRWPCA may be required to consult with the USFWS to determine whether the proposed action is likely to adversely affect a federally listed terrestrial or freshwater animal or plant species under USFWS jurisdiction, or the designated critical habitat for such species; jeopardize the continued existence of such species that are proposed for listing under ESA; or adversely modify proposed critical habitat. To make this determination, the project applicant prepares a Biological Assessment, the outcome of which determines whether the USFWS will conduct "formal consultation" and issue a Biological Opinion concerning the effects of the project. If the USFWS finds that the project may jeopardize the species or destroy or modify critical habitat, reasonable and prudent alternatives to the action must be considered.
	Fish and Wildlife Coordination Act (16 USC 661-667e; Act of March 10, 1934; ch. 55; 48 stat. 401)	Under Fish and Wildlife Coordination Act, a proposed water resource development project that receives federal funds or permits and that may impact to fish and wildlife is required to consult with National Oceanic and Atmospheric Administration (NOAA) Fisheries and USFWS.
National Oceanic and Atmospheric Administration (NMFS)	Endangered Species Act compliance Section 7 consultation	The need for a federal permit requires the project applicant to consult with NMFS to determine whether the proposed action is likely to adversely affect a federally listed marine species or designated critical habitat for such species, jeopardize the continued existence of such species that are proposed for listing under ESA, or adversely modify proposed critical habitat. To make this determination, the project applicant prepares a Biological Assessment, the outcome of which determines whether NMFS will conduct "formal consultation" with the agency and issue a Biological Opinion concerning the effects of the proposed action. If NMFS finds that the action may cause jeopardy or critical habitat destruction or modification, it will propose reasonable and prudent alternatives to the action. Alternatively, if no jeopardy is found, then the action can proceed.
Army Corps of Engineers (USACE)	Nationwide or Individual Section 404 Permit (Clean Water Act, 33 USC 1341)	Projects that would discharge dredged or fill material into waters of the United States, including wetlands, require a USACE permit under Clean Water Act Section 404.
	Section 10, Rivers and Harbors Act Permit (33 U.S.C. 403)	Any obstruction or alteration of any navigable water requires a Section 10 permit. This includes work that affects the course, location or condition of the water body.
Federal Aviation Administration (FAA)	Form SF 7460-1 Notice of Proposed Construction & Alteration for Airport Airspace Aeronautical	14 CFR Part 77.9 requires that a project proponent submit notification of proposed construction at least 45 days prior notification of construction or alteration within 10,000 feet of a public use or military airport which exceeds a 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 feet.
State Agencies		
California Public Utilities Commission (CPUC)	Monterey Peninsula Water Supply Project (MPWSP) Certificate of Public Convenience and Necessity (Application No. 12-04-019)	The CPUC has the authority to issue a Water Purchase Agreement to CalAm for purchase of water produced by the GWR Project.
State Water Resources Control Board (SWRCB), Regional Water Quality Control Board (RWQCB)	National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity (99-08-DWQ)	Any discharge of stormwater to surface waters of the United States from a construction project that encompasses one (1) acre or more of soil disturbance requires compliance with the General Permit: Development and implementation of a stormwater pollution prevention plan that specifies best management practices to prevent construction pollutants from contacting stormwater, with the intent of keeping all products of erosion from moving offsite into receiving waters;

Table 2-22
List of Permits and Authorizations

Agency /Entity	Permitting Regulation/Approval Requirement	Discussion
		Elimination or reduction of non-stormwater discharges to storm sewer systems and other waters of the U.S. and inspection of all best management practices.
	Water rights permit for development of new surface water diversions	A water right permit is an authorization to develop a water diversion and use project.
	Waste Discharge Requirements (Water Code 13000 et seq.)	Any activity that results or may result in a discharge of waste that directly or indirectly impacts the quality of waters of the state (including groundwater or surface water) or the beneficial uses of those waters is subject to waste discharge requirements.
	401 Water Quality Certification (Clean Water Act Section 401)	Under Section 401 of the Clean Water Act, the RWQCB must certify that actions receiving authorization under Section 404 of the Clean Water Act also meet state water quality standards. Any applicant for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into navigable waters, must provide the licensing or permitting agency a certification that the activity meets state water quality standards.
	National Pollutant Discharge Elimination System (NPDES) Permit (Clean Water Act Section 402)	Discharges of effluent into surface waters of the United States, including wetlands and MBNMS, requires NPDES permit approval. It is assumed that the MRWPCA Waste Discharge Requirements Order No. R3-2008-0008 NPDES Permit No. CA0048551 would be revised to include the Proposed Project reverse osmosis reject water (concentrate or brine).
State Water Resources Control Board – Division of Drinking Water	Permit to Operate a Public Water System (California Health and Safety Code Section 116525)	The State Board has permitting authority over the operation of a public water system and provides oversight with respect to the quality of the product water produced.
	Approval for Recharge of Purified recycled Water	Approval of Engineering Report (see Chapter 3 for discussion).
California State Lands Commission	Right-of-Way Permit (Land Use Lease) (Public Resource Code Section 1900); Lease amendment	Issuance of a grant of right-of-way across state lands allows the permittee to conduct work or construction on public lands.
California Department of Fish and Wildlife (CDFW)	Incidental Take Permits (California Endangered Species Act Title 14, Section 783.2 (potential)	The take of any endangered, threatened, or candidate species may be allowed by permit if it is incidental to an otherwise lawful activity and if the impacts of the authorized take are minimized and fully mitigated. No permit may be issued if the activity would jeopardize the continued existence of the species.
	Streambed Alteration Agreement (California Fish and Wildlife Code Section 1602) (potential)	In order 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, the CDFW must first be notified of the proposed activity.
California Coastal Commission (CCC)	Coastal Development Permit (Public Resources Code 30000 et seq.)	Development proposed within the Coastal Zone requires a Coastal Development Permit from the CCC, except where the local jurisdiction has an approved Local Coastal Program (LCP) in place. If an approved LCP is in place, primary responsibility for issuing permits in coastal areas shifts from the CCC to the local government, although the CCC will hear appeals on certain local government coastal development decisions. Regardless of whether a Coastal Development Permit must be obtained from a local agency in accordance with an approved Local Coastal Program, 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." (Public Resources Code Sections 30601, 30600[b][2]).
California Department of Transportation (Caltrans)	Encroachment Permit (Streets and Highway Code Section 660)	Caltrans has permitting authority over encroachments in, under, or over any portion of a state highway right-of-way.
California State Historic Preservation Officer (SHPO)	National Historic Preservation Act (NHPA) Section 106 Consultation (16 USC 470)	The NHPA requires federal permitting agencies to consider the effects of proposed federal undertakings on historic properties. Federal agencies are required to initiate consultation with the SHPO and give the Advisory Council on Historic Preservation a reasonable opportunity to comment as part of the Section 106 review process.
California State University Monterey Bay (CSUMB)	Right of Way Agreements and/or Easements	A right-of-way agreement with the State of California for access across state lands around CSUMB.
Regional/Local Agencies		

Table 2-22
List of Permits and Authorizations

Agency /Entity	Permitting Regulation/Approval Requirement	Discussion
Cities of Seaside and Marina, Sand City, Salinas	Use Permits, encroachment/easement permits, grading permits and erosion control permits may be required pursuant to local city/county codes.	The Cities of Seaside, Marina, Sand City, and Salinas may require discretionary permits for encroachment, tree removal or trimming, building permits, grading or variances. Excavations greater than 10 cubic yards within an Ordinance Remediation District, in the Former Fort Ord areas, require a permit in compliance with Chapter 15.34, Digging and Excavation, on the Former Fort Ord Ordinance ("Seaside's Ordinance"). Permit approval is subject to requirements placed on the property by an agreement executed between the city, the city's redevelopment agency, Fort Ord Reuse Authority, and California Department of Toxic Substances Control.
Fort Ord Reuse Authority	Coordination with Fort Ord Reuse Authority for right of entry	In order to access specific sites during construction and operations, MRWPCA will be required to coordinate with Fort Ord Reuse Authority.
Marina Coast Water District	Ownership/easements of RUWAP pipeline and its alignment and recycled water rights per Third Amendment to the 1992 Agreement between Monterey County Water Resources Agency, MRWPCA, and Marina Coast Water District	Possible lease agreement for use of RUWAP pipeline or easement and possible agreement to utilize a portion of secondary effluent for which Marina Coast Water District has rights
Monterey Bay Unified Air Pollution Control District	Authority To Construct (Local district rules, per Health and Safety Code 42300 et seq.) and Permit To Operate (local district rules)	An authorization to construct permit is required for projects that propose to build, erect, alter, or replace any article, machine, equipment, or other contrivance that may emit air contaminants from a stationary source or may be used to eliminate, reduce, or control air contaminant emissions. Applicable to gas-powered generators.
Monterey County Health Department, Environmental Health Division	Well Construction Permit (Monterey County Code, Title 15 Chapter 15.08, Water Wells)	Construction of new water supply / monitoring wells requires written permit approval from Monterey County's health officer, whose decisions may be appealed to the Board of Supervisors.
	Hazardous Materials Business Response Plan (Health and Safety Code Chapter 6.95)	Hazardous Materials Management Services is designated as the local Certified Unified Program Agency in Monterey County and is responsible for inspecting facilities in the county to verify proper storage, handling and disposal of hazardous materials and hazardous wastes. A Materials Business Response Plan is required during specific types of construction.
	Hazardous Materials Inventory (Health and Safety Code Chapter 6.95)	A Hazardous Materials Inventory and Certification form will have to be submitted to the Monterey County Environmental Health Division.
	Review/approval of Injection Well Operations/Discharges	MRWPCA may need to submit an application to the Monterey County Environmental Health Department for review of Waste Discharge Requirements and/or Injection Well Facilities operations.
	Variance from Monterey County Noise Ordinance (MCC 10.60.030)	The Proposed Project may require a noise ordinance permit if operation or equipment noise levels exceed 85dBA at 50 feet.
Monterey County Public Works Department	Encroachment Permit (Monterey County Code (MCC) Title 14 Chapter 14.040)	Designated activities within the right-of-way of a county highway require encroachment permit approval by the director of the Public Works Department.
Monterey County Resource Management Agency	Use Permit (MCC Chapter 21.74 Title 21) may be required pursuant to County codes.	A Use Permit is either issued by the zoning department of the Planning Commission, depending on the specific zoning and intended use; this permit may be needed for the Product Water Conveyance Pipeline (both options) between the Regional Treatment Plant and the City of Marina.
	Coastal Development Permit. (Public Resources Code 30000 et seq.)	A Coastal Development Permit is a document required by the California Coastal Act to permit construction of certain uses in a designated Coastal Zone. Any project in the Coastal Zone, which requires discretionary approval, may require a Coastal Permit.
	Grading Permit (Grading and Erosion Control Ordinance, Monterey County Code 16.08 – 16.12)	Grading, subject to certain exceptions, may require a permit from the Monterey County Planning and Building Inspection Department..
	Erosion Control Permit (Grading and Erosion Control Ordinance, Monterey County Code 16.08 – 16.12)	An Erosion Control Permit from the Director of Building Inspection may be required for any project development and construction activities (such as site cleaning, grading, and soil removal or placement) that is causing or is likely to cause accelerated erosion.
Monterey County Water Resource Agency	Ownership of flood control waterways and SWRCB water rights application for diversions from surface water bodies	Coordination/agreements for Proposed Project components within Monterey County Water Resources Agency-controlled waterways, including agreements to assign/transfer water rights to allow diversion, and involving the Castroville Seawater Intrusion Project and Salinas Valley

Table 2-22
List of Permits and Authorizations

Agency /Entity	Permitting Regulation/Approval Requirement	Discussion
		Reclamation Project.
Monterey Peninsula Water Management District	Water System Expansion Permit (Monterey Peninsula Water Management District Board of Directors Ordinance 96)	A permit is required for any project activity that would expand the water delivery system within the Monterey Peninsula Water Management District jurisdiction.
	Water purchase agreement	The Proposed Project will require a water purchase agreement that describes the arrangement between MRWPCA, Monterey Peninsula Water Management District, and CalAm for the purchase of GWR product water or the rights to pump it from the Seaside Groundwater Basin.
Monterey Regional Waste Management District	Electric Power Purchase Agreement	A power purchase agreement between Monterey Peninsula Water Management District and MRWPCA and PG&E for a specific amount of time and cost.
Seaside Basin Watermaster	Permit for Injection/Extraction/Storage	Injection/extraction/storage activities that would affect the Seaside Groundwater Basin require approval of the Seaside Groundwater Basin Watermaster.
Transportation Agency of Monterey County	Easement/ encroachment permit	An encroachment permit may be necessary to conduct investigations and to install a conveyance pipeline across this agency's property.
Monterey Peninsula Airport District//Airport Land Use Commission	Consistency determination	Lake El Estero Diversion site is within Monterey Airport Influence Area; construction may require a Consistency Determination by the Airport Land Use Commission
Private Entities		
Landowners	Land lease/sale; easements and encroachment agreements	Construction that may occur on private lands may require lease agreements and easements for access.
California American Water Company (CalAm)	Water purchase agreement	The Proposed Project will require a water purchase agreement that describes the arrangement between MRWPCA, Monterey Peninsula Water Management District, and CalAm for the purchase of GWR product water or the rights to pump it from the Seaside Groundwater Basin.
Pacific Gas and Electric	Electric Power Will-Serve Letter/Purchase Agreement	New construction and/or commercial additions will need an "ability to serve" letter stating that Pacific Gas and Electric can serve power from existing (or if necessary, upgraded) infrastructure.

2.14 REFERENCES

California Department of Water Resources, 2004. *Bulletin 118, California's Groundwater*, 2004 Update

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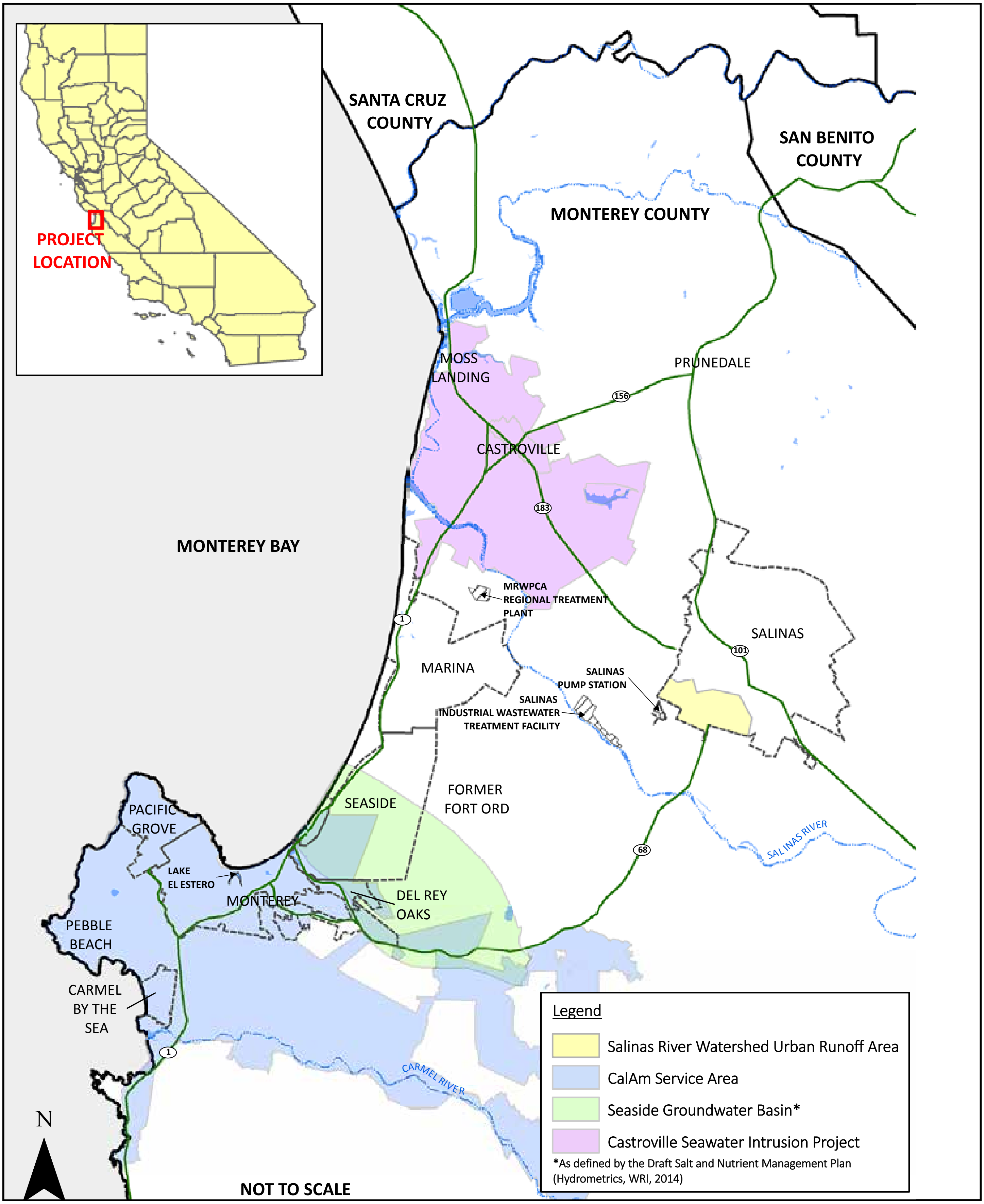

Project Location Map

April 2015

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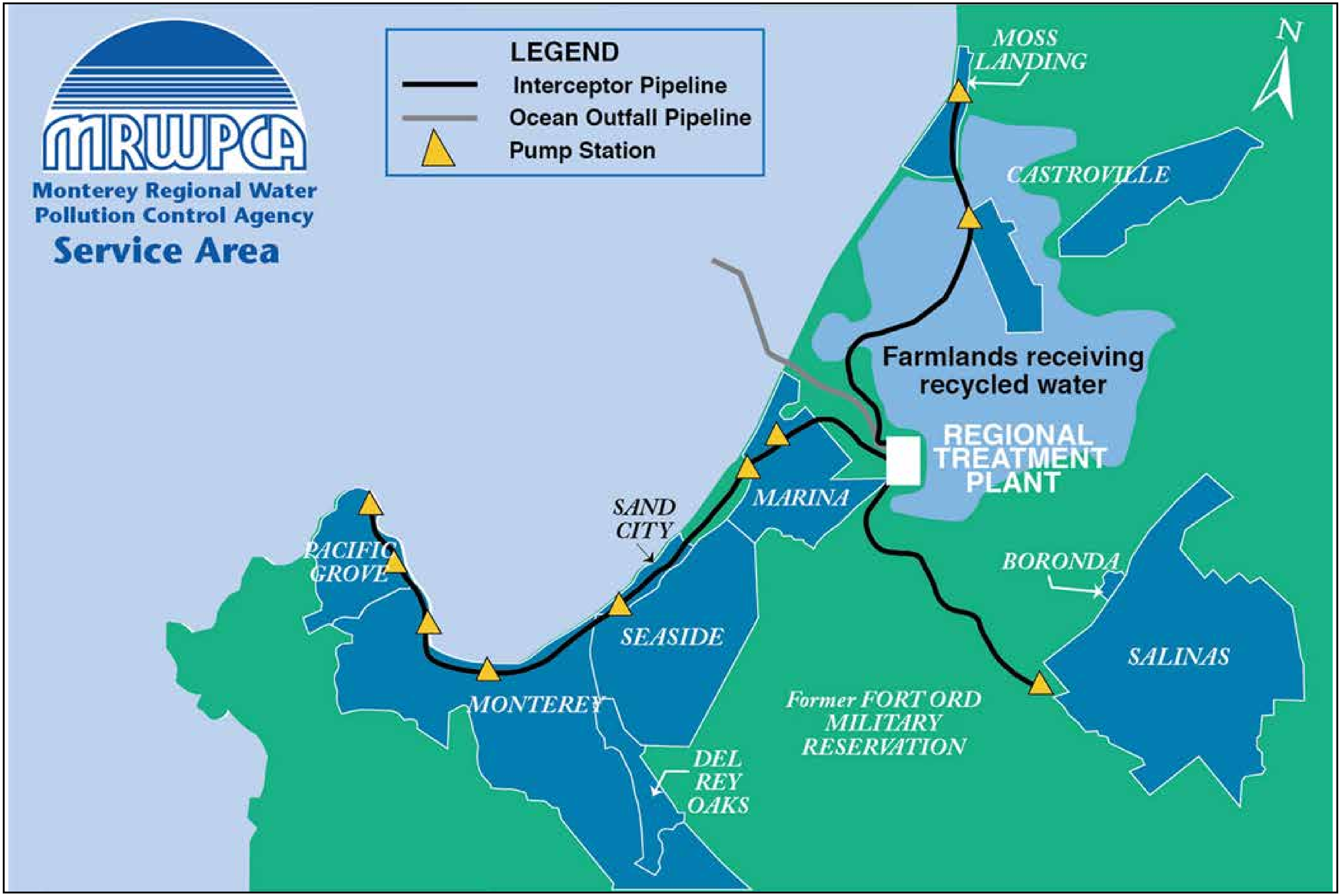
Draft EIR

Figure
2-1



MRWPCA Service Area Map

April 2015

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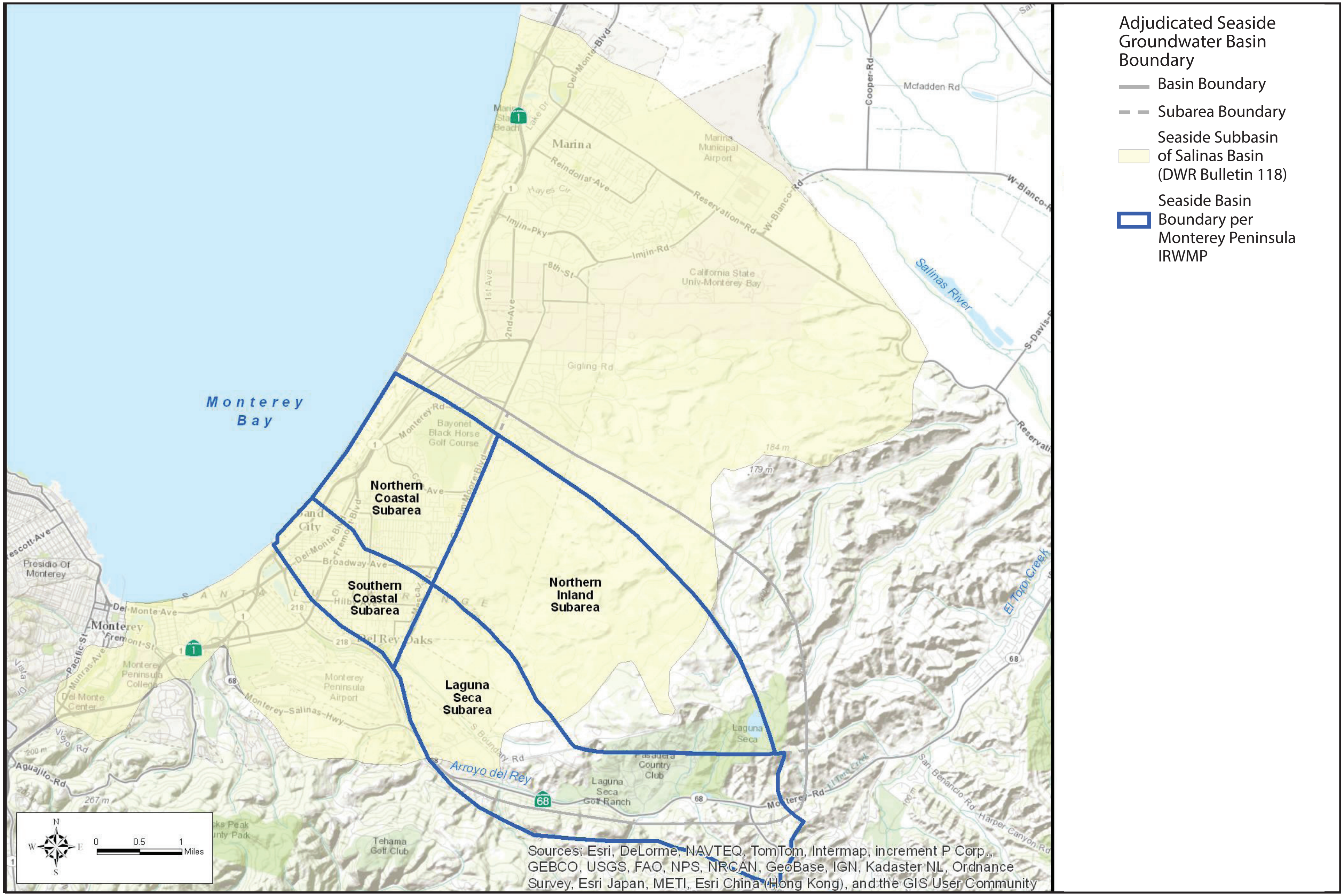
Draft EIR

Figure 2-2

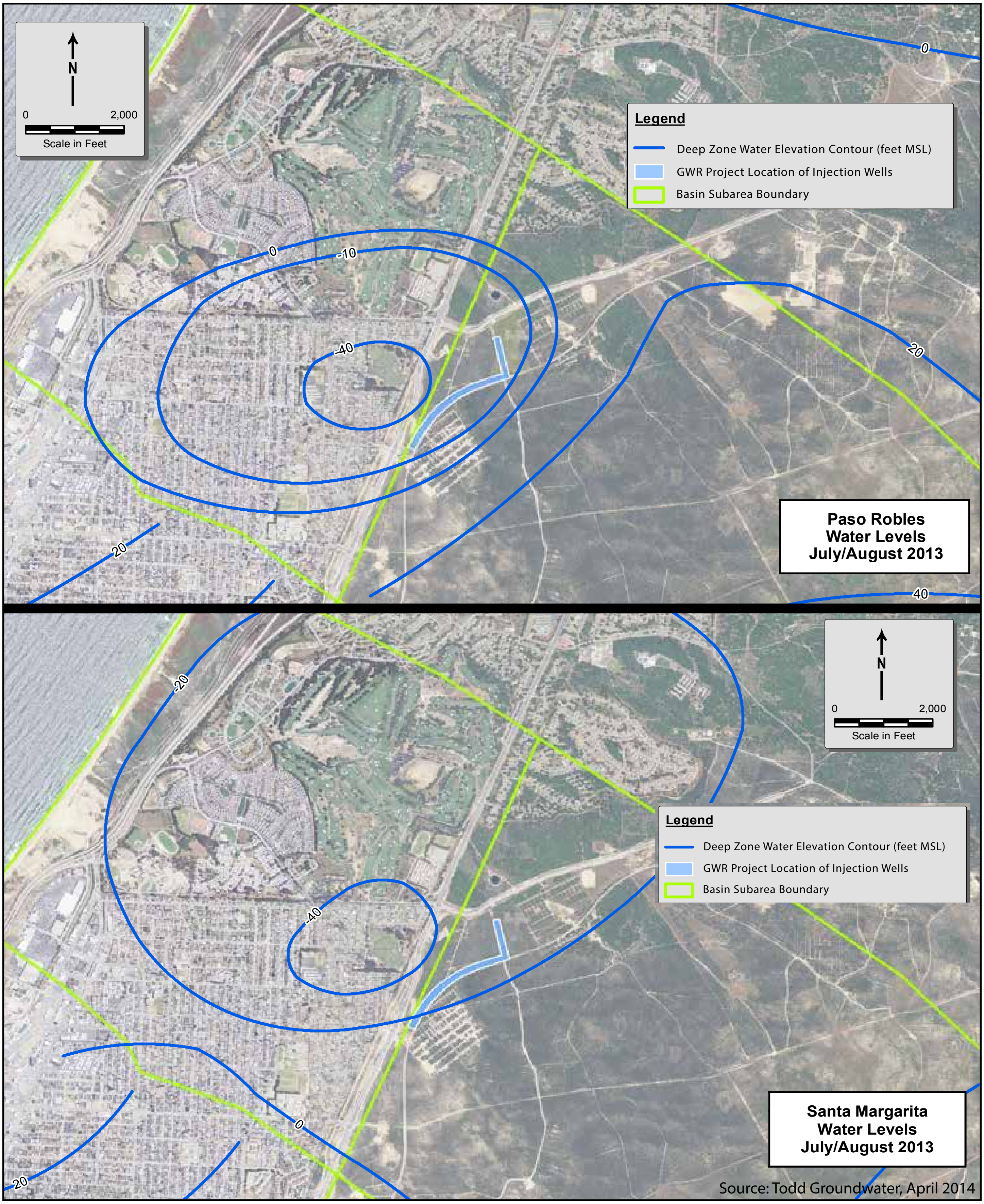


Seaside Groundwater Basin Boundaries

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure 2-3



DD&A

Seaside Groundwater Basin Groundwater Levels

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
2-4

Source: Schaaf & Wheeler Consulting Civil Engineers, 2014

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Salinas River Basin

April 2015

Pure Water Monterey GWR Project
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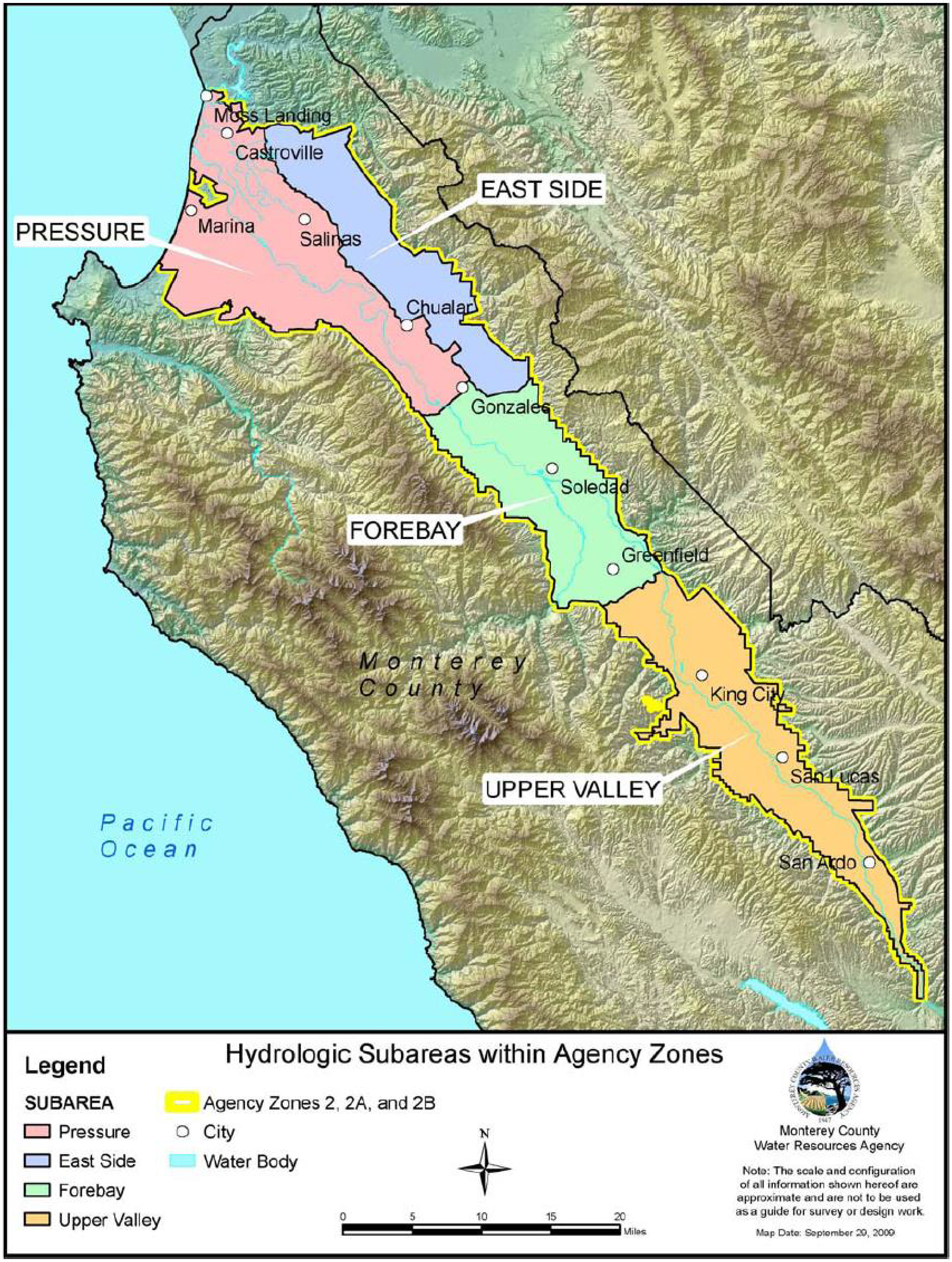
Figure
2-5



Source: Schaaf & Wheeler Consulting Civil Engineers, 2014

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Salinas Valley Groundwater Basin

April 2015

Pure Water Monterey GWR Project
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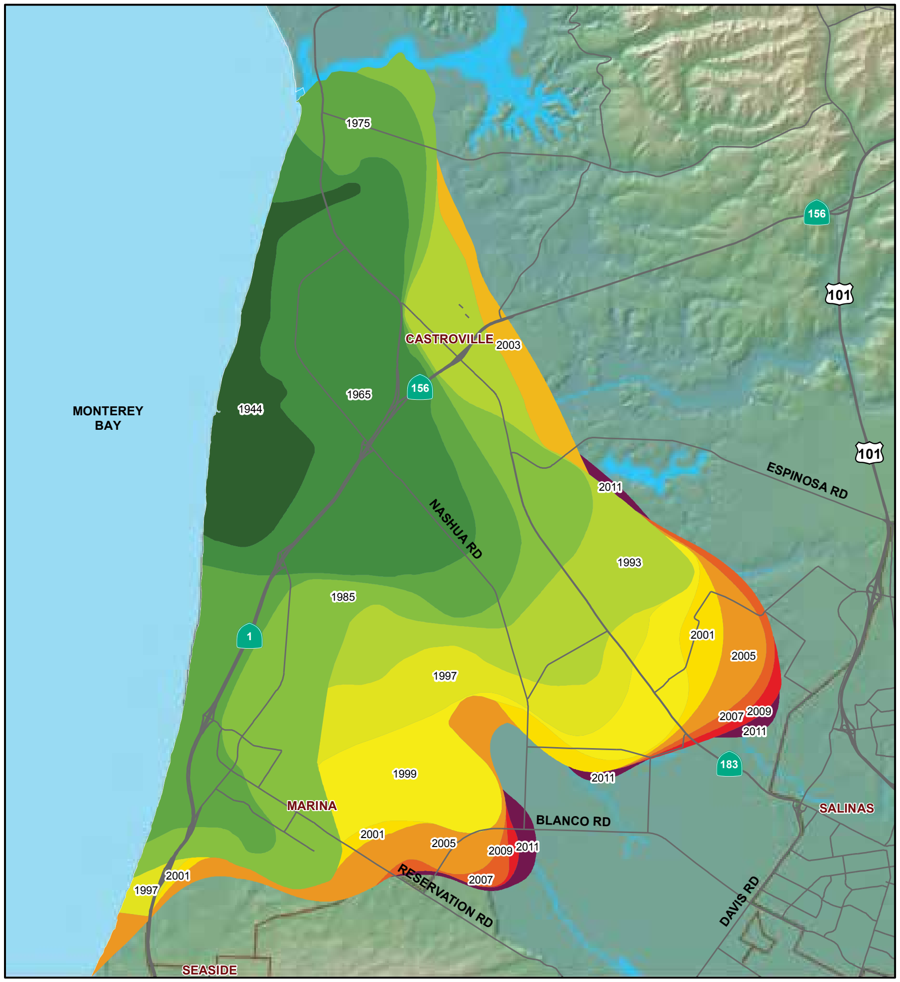
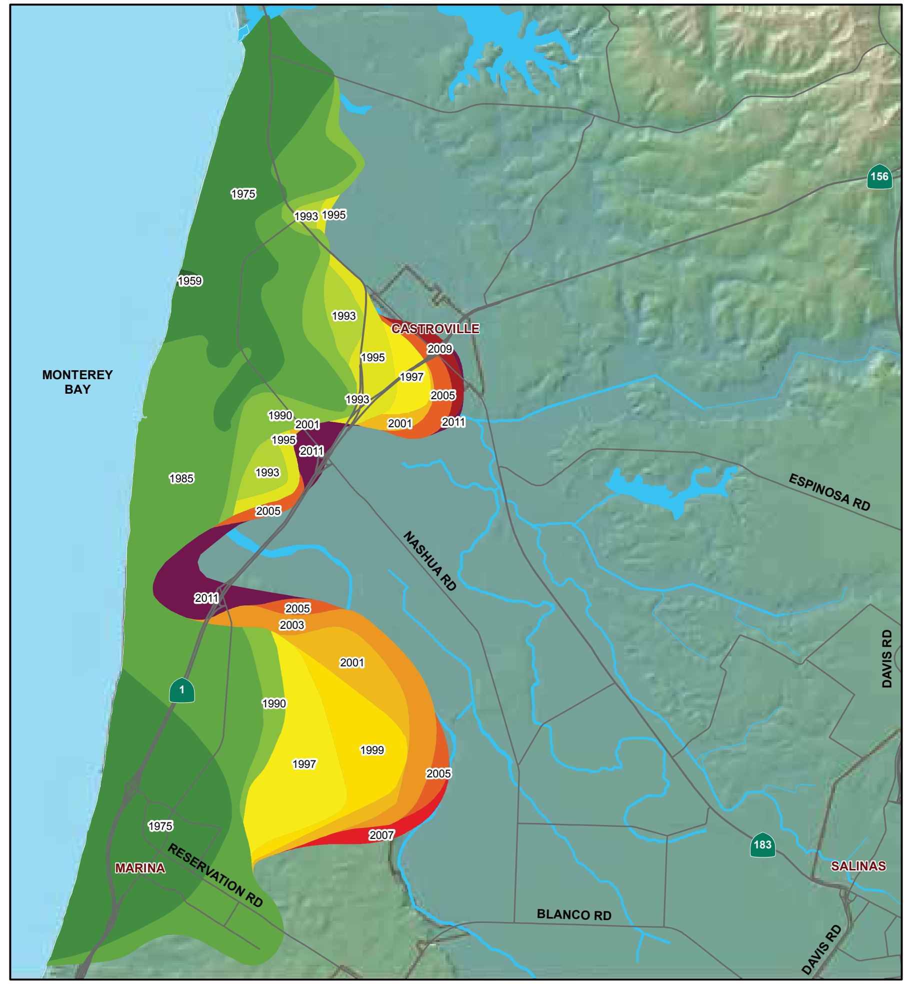
Figure
2-6



Historic Seawater Intrusion Map
Pressure 180-Foot Aquifer - 500 mg/L Chloride Areas



Historic Seawater Intrusion Map
Pressure 400-Foot Aquifer - 500 mg/L Chloride Areas

Legend

Seawater Intruded Areas By Year

1944, 1965, 1975, 1985, 1993, 1997, 1999, 2001, 2003, 2005, 2007, 2009, 2011, Cities

0 0.5 1 1.5 2 Miles

Note: The scale and configuration of all information shown hereon are approximate and are not intended as a guide for survey or design work. Contours lines are drawn from best available data.

Map Date: August 7, 2012

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Salinas Valley Groundwater Basin Seawater Intrusion

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Figure 2-7

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Existing Regional Treatment Plant Facilities Map

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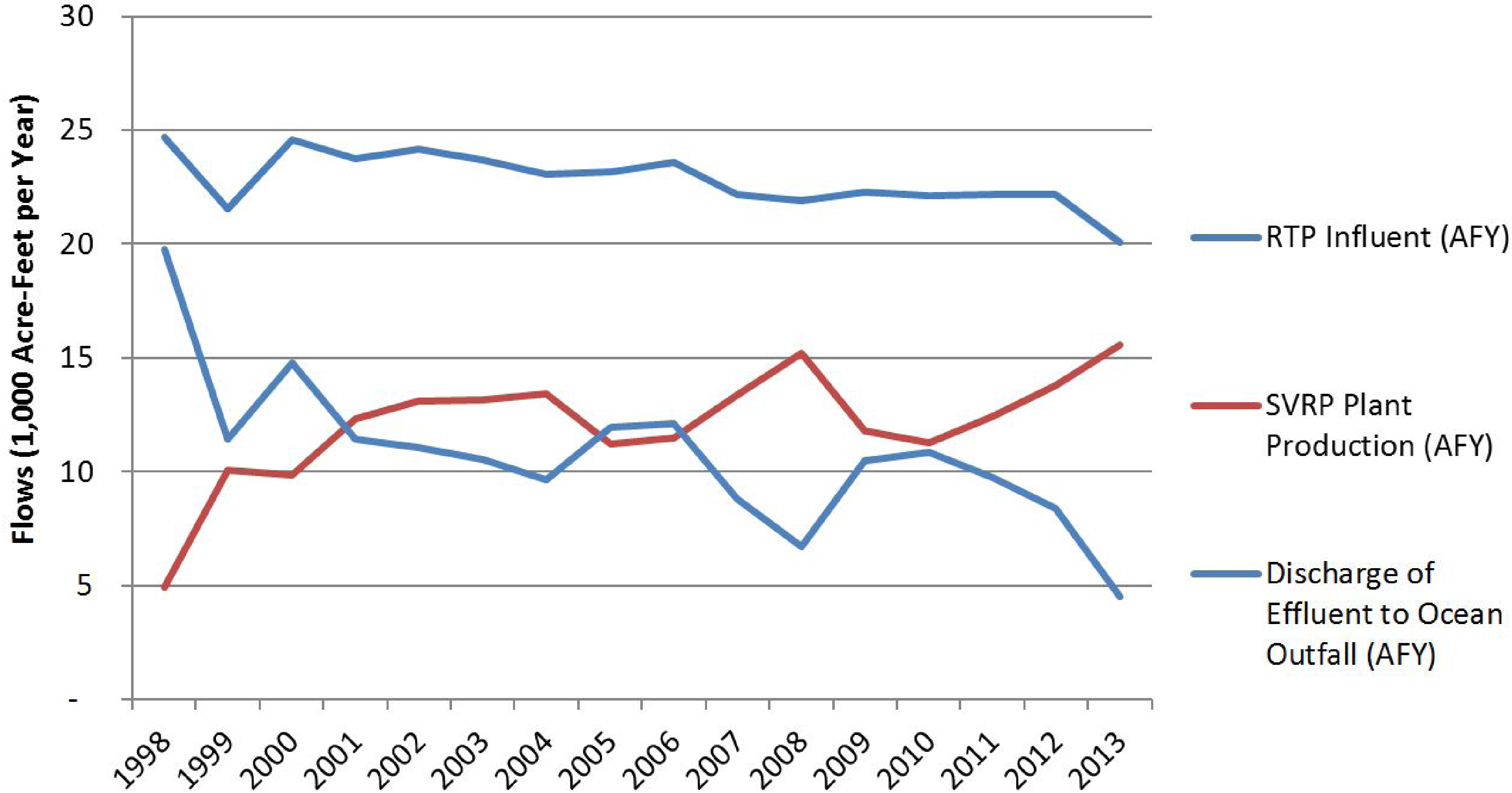
Figure
2-8



Historic Regional Treatment Plant Flows

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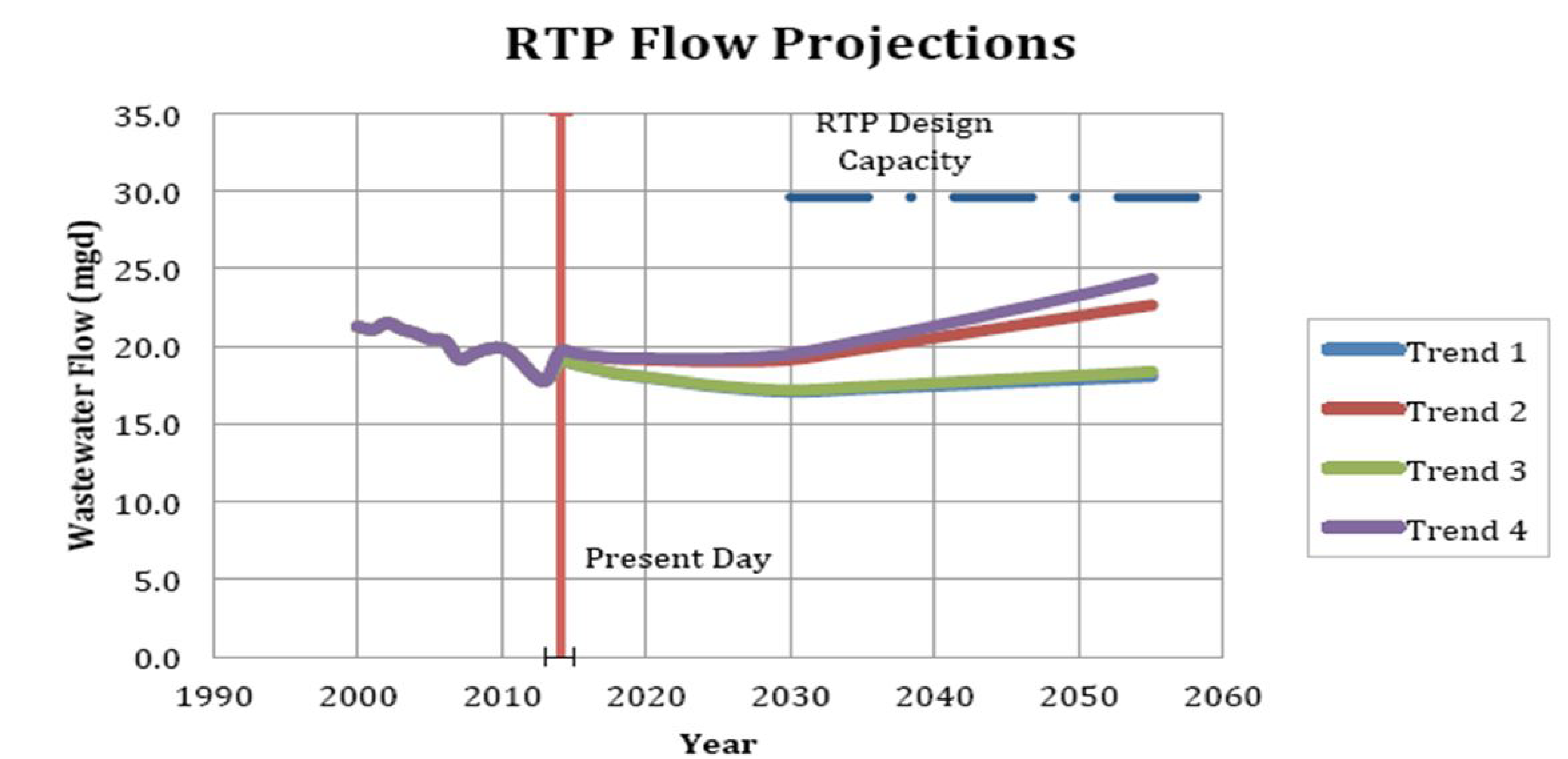
Figure
2-9



Source: MRWPCA 40-Year Flow Projections Report, Brezack & Associates, 2014

Legend	Description
Trend 1	A linear curve is fitted to data from year 2000 to 2012
Trend 2	A linear curve is fitted to data from year 2006 to 2012
Trend 3	An exponential curve is fitted to data from year 2000 to 2012
Trend 4	An exponential curve is fitted to data from year 2006 to 2012

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Projected Regional Treatment Plant Flows

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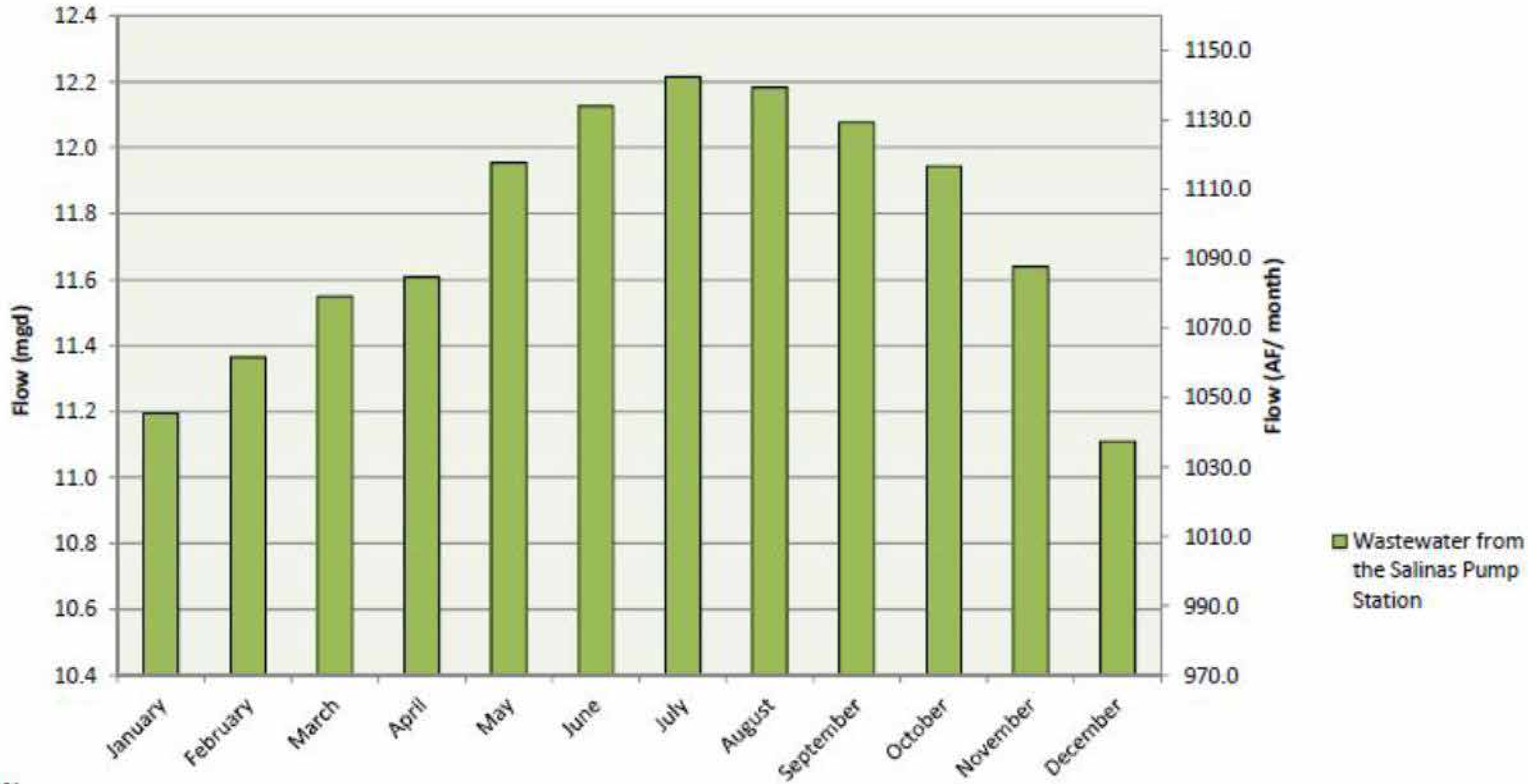
Figure
2-10



Notes:

1. Scale expanded to show differences in monthly flow rates.

Salinas Pump Station Monthly Average Discharge

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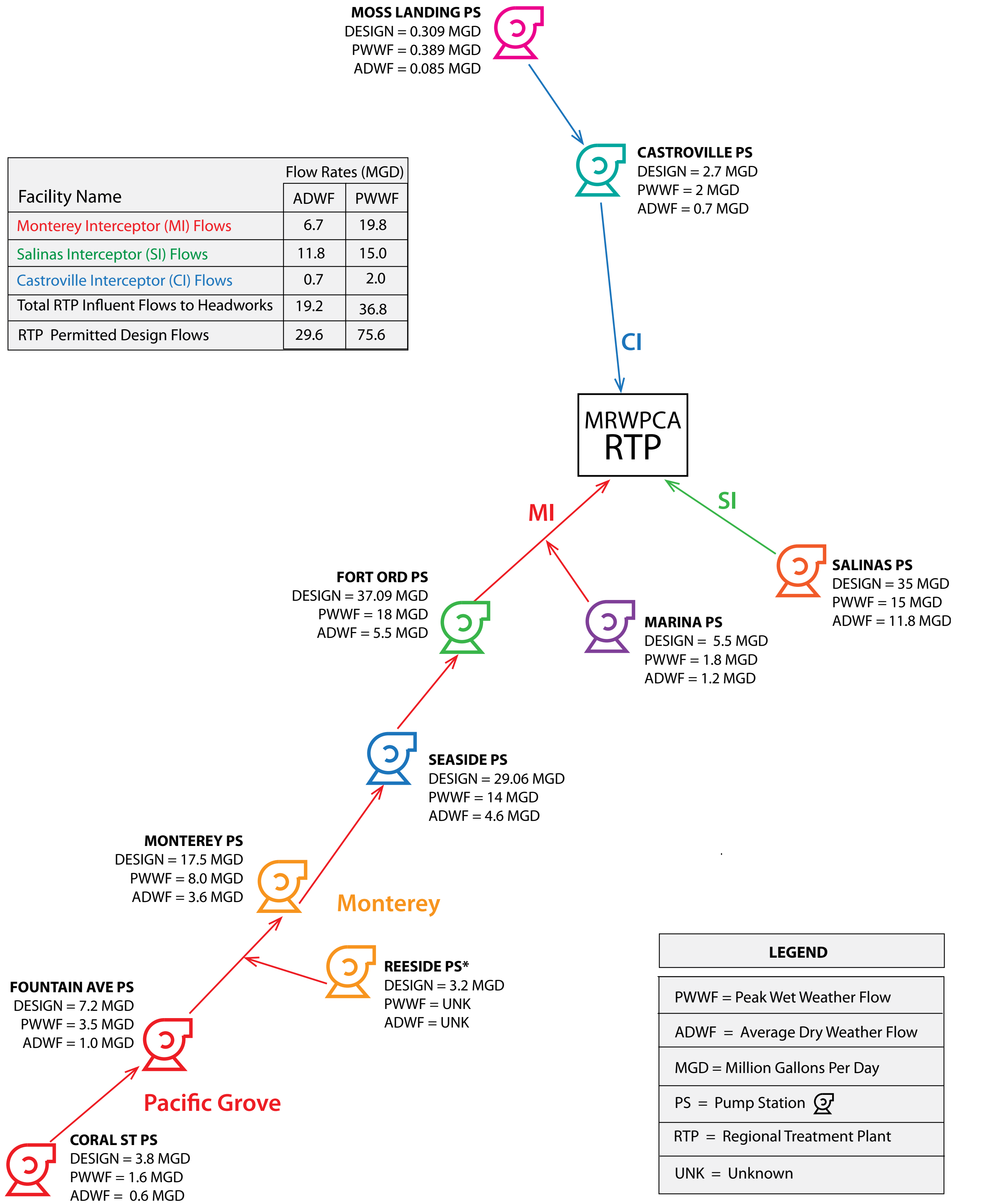
Draft EIR

Figure 2-11



Facility Name	Flow Rates (MGD) ADWF	PWWF
Monterey Interceptor (MI) Flows	6.7	19.8
Salinas Interceptor (SI) Flows	11.8	15.0
Castroville Interceptor (CI) Flows	0.7	2.0
Total RTP Influent Flows to Headworks	19.2	36.8
RTP Permitted Design Flows	29.6	75.6

LEGEND
PWWF = Peak Wet Weather Flow
ADWF = Average Dry Weather Flow
MGD = Million Gallons Per Day
PS = Pump Station
RTP = Regional Treatment Plant
UNK = Unknown

Source: Brezack & Associates, September 2013

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MRWPCA Wastewater Collection System Network Diagram and Pump Station Flows
April 2015

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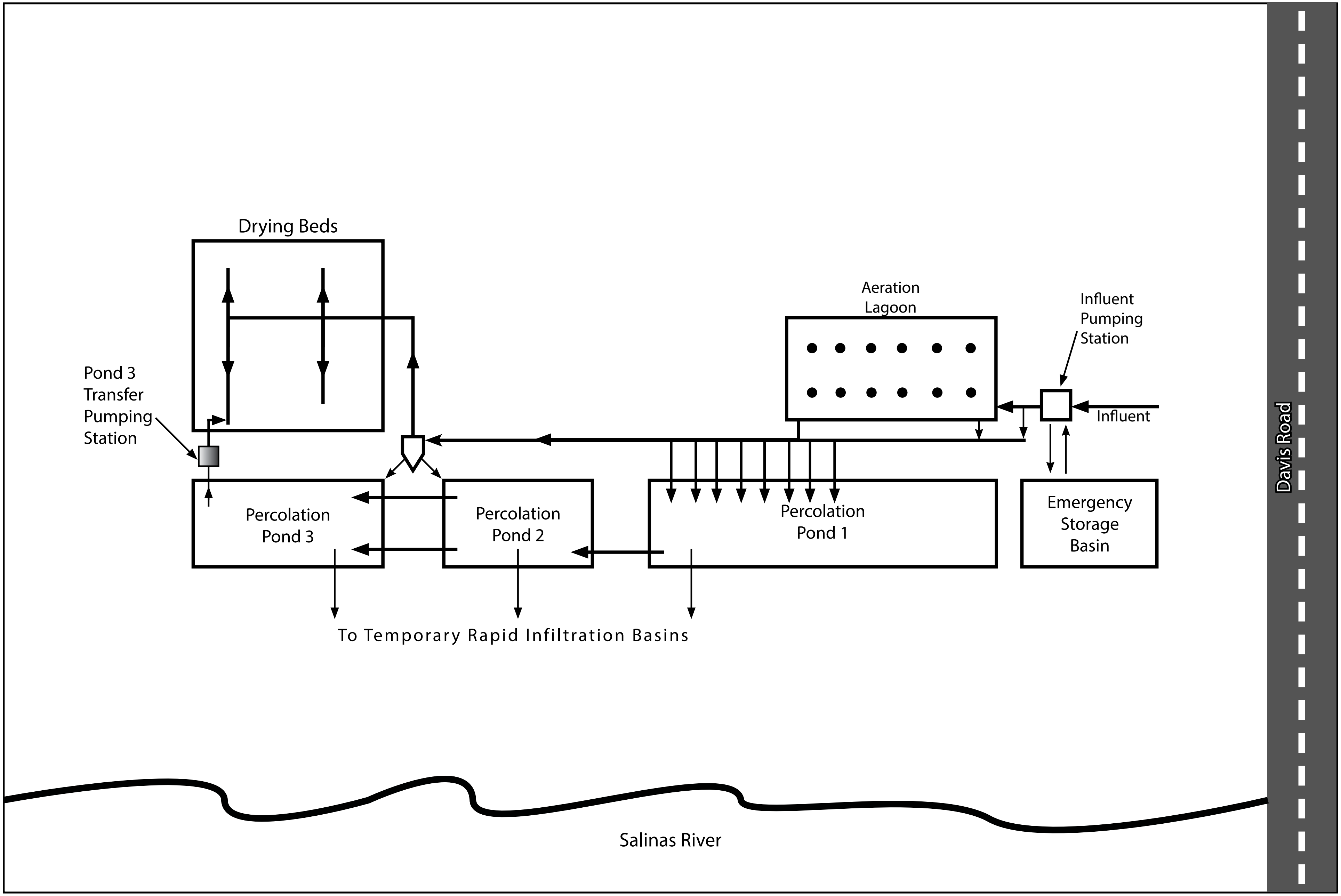
Figure 2-12



Salinas Industrial Wastewater Treatment Facility Process Flow Schematic

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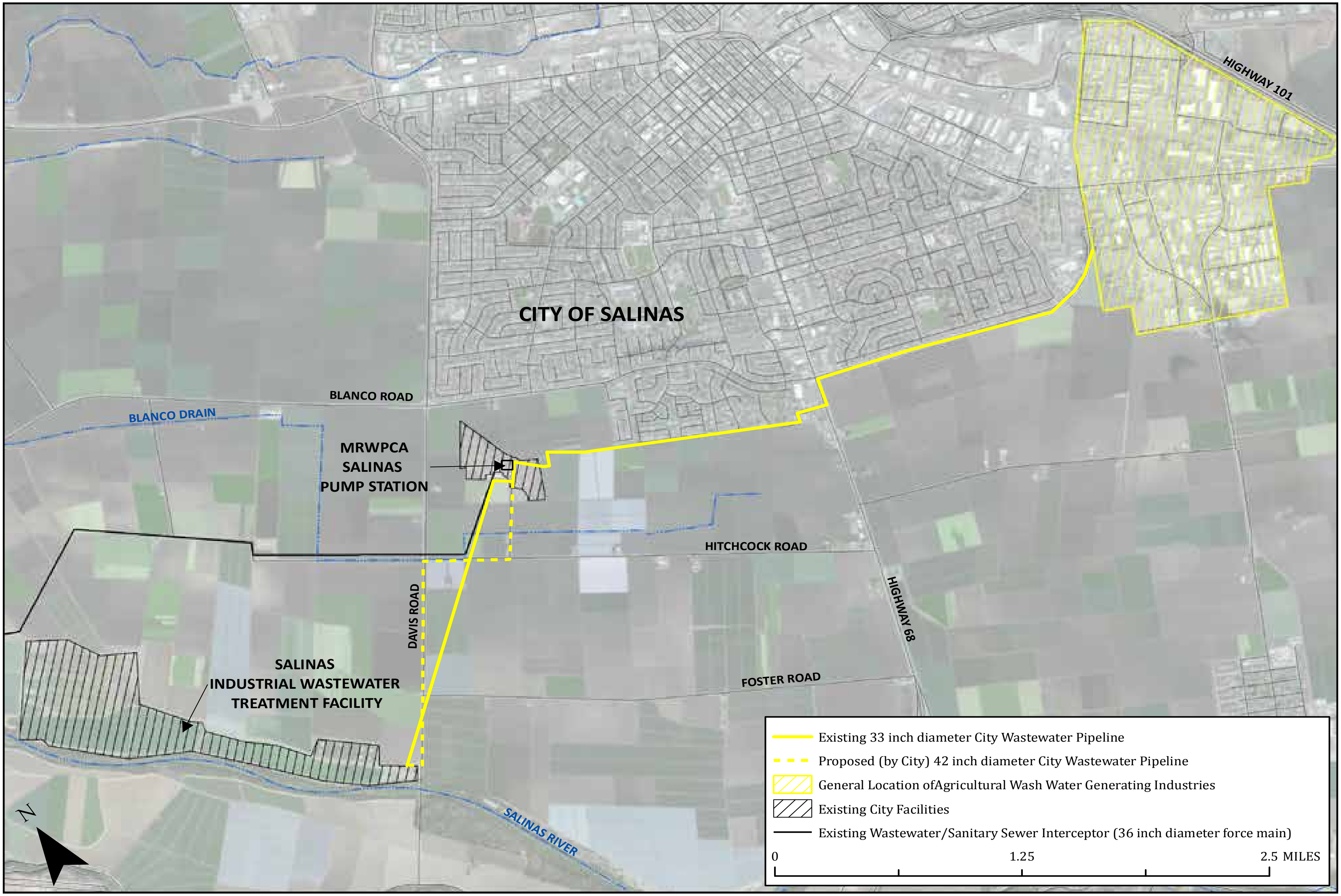
Figure
2-13



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Salinas Industrial Wastewater System Location Map

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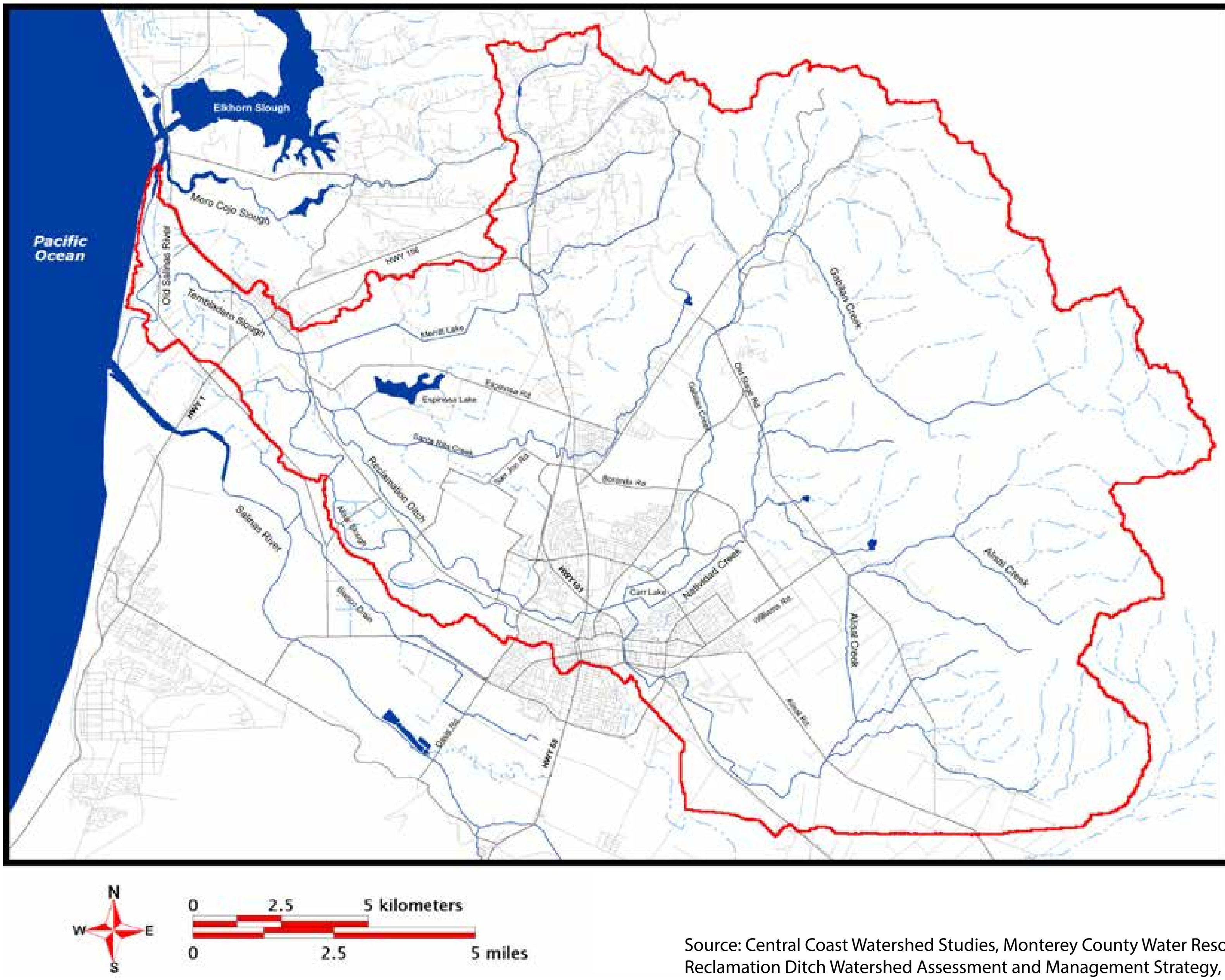
Figure
2-14



Source: Central Coast Watershed Studies, Monterey County Water Resources Agency - Reclamation Ditch Watershed Assessment and Management Strategy, undated

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Reclamation Ditch Watershed Boundary

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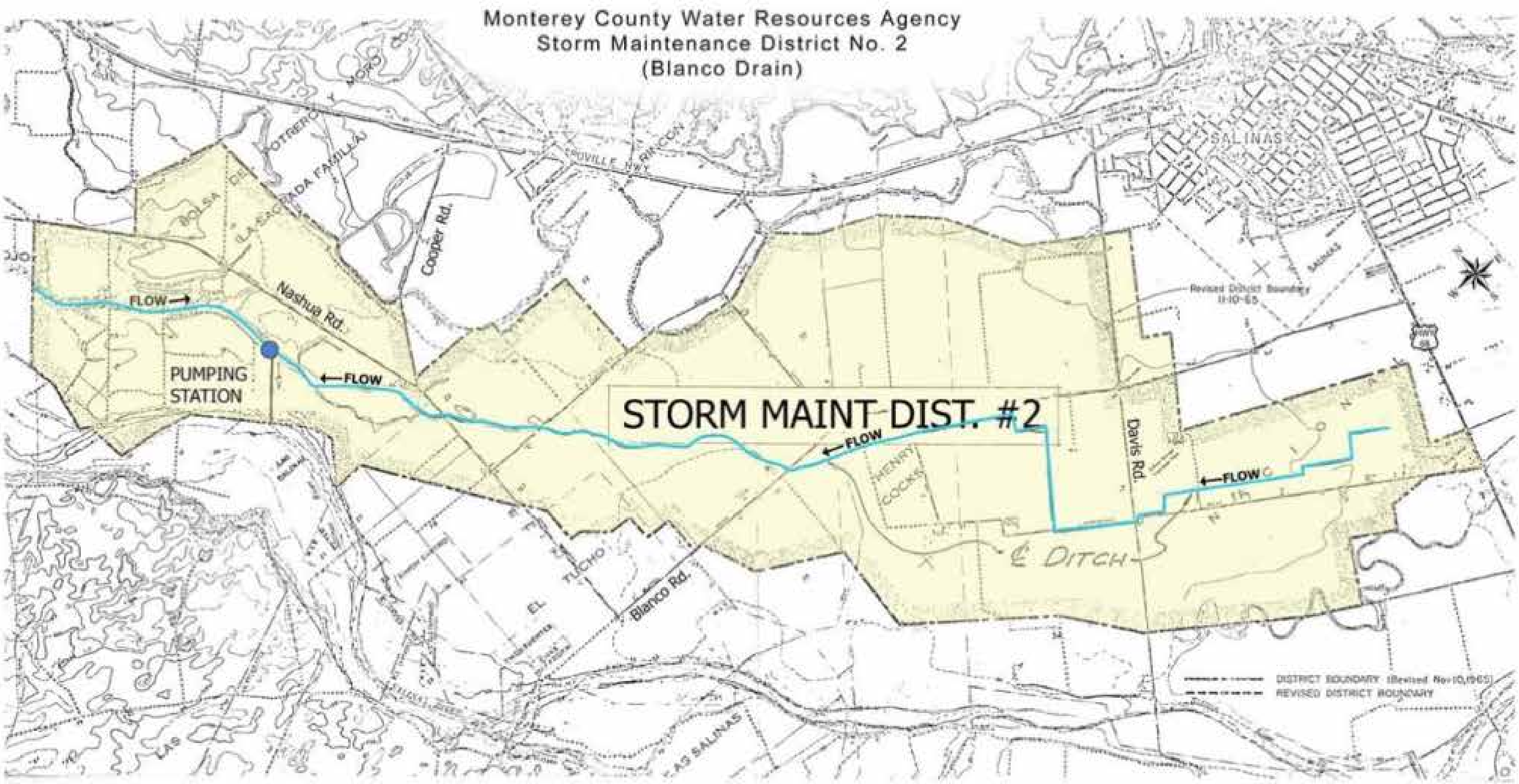
Draft EIR

Figure 2-15



Source: Schaaf & Wheeler Consulting Civil Engineers, 2014

Blanco Drain Storm Drain Maintenance District

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Figure
2-16

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Aquifer Storage and Recovery Project Location Map

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Figure
2-17

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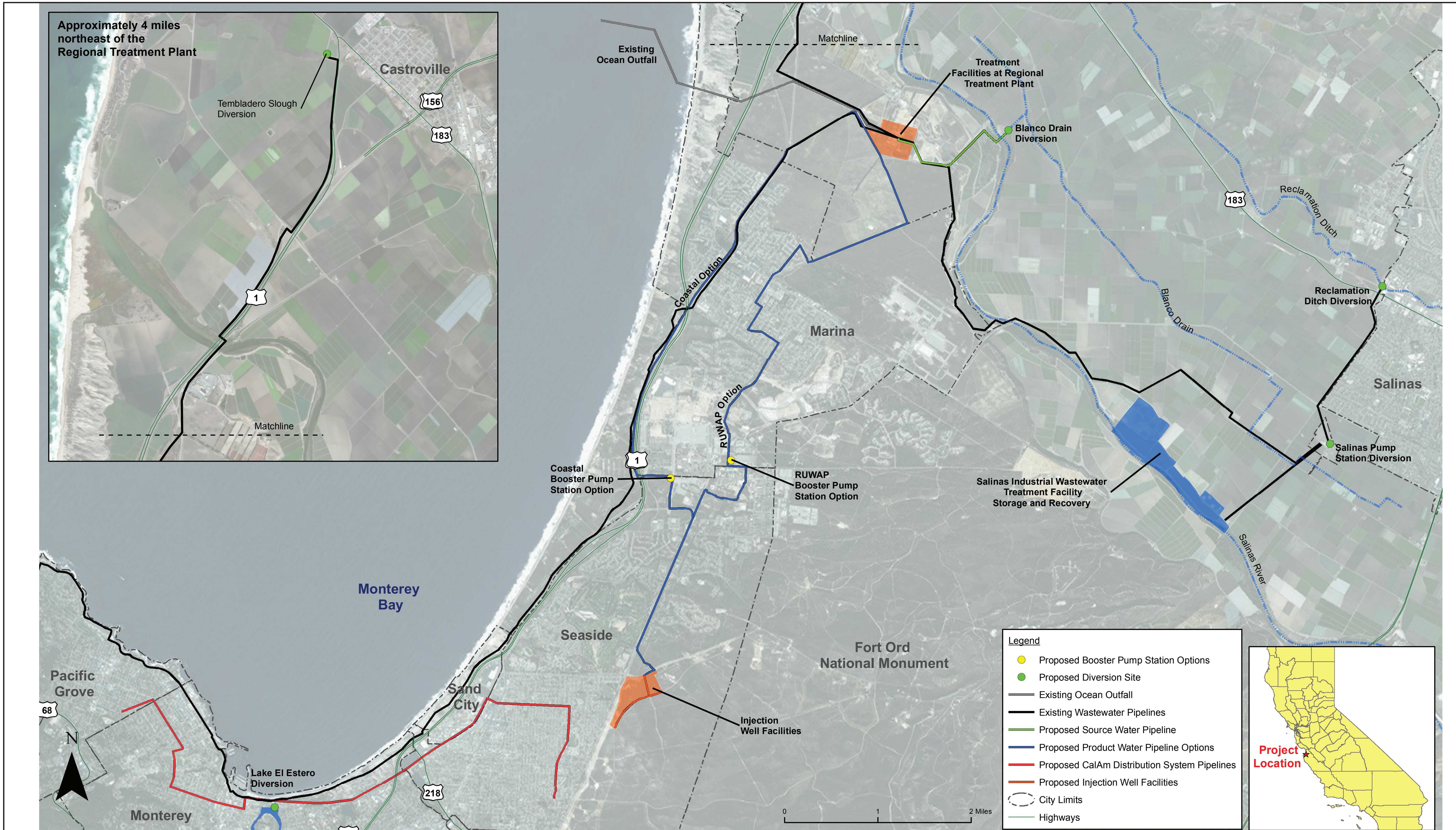

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Proposed GWR Project Facilities Overview

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Pure Water Monterey GWR Project
Draft EIR

Figure
2-18

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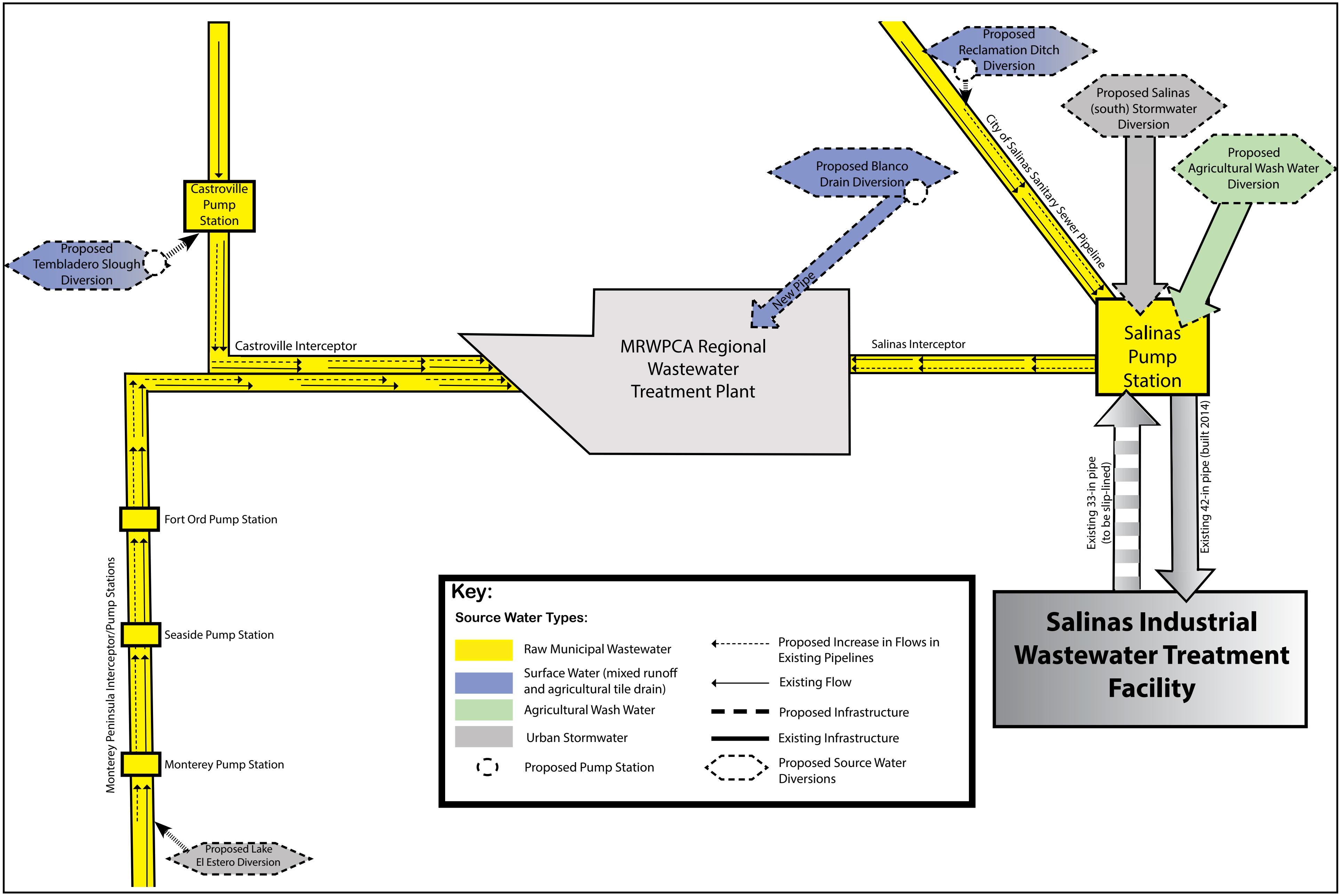

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Proposed Project Flow Schematic - Source Water to Treatment

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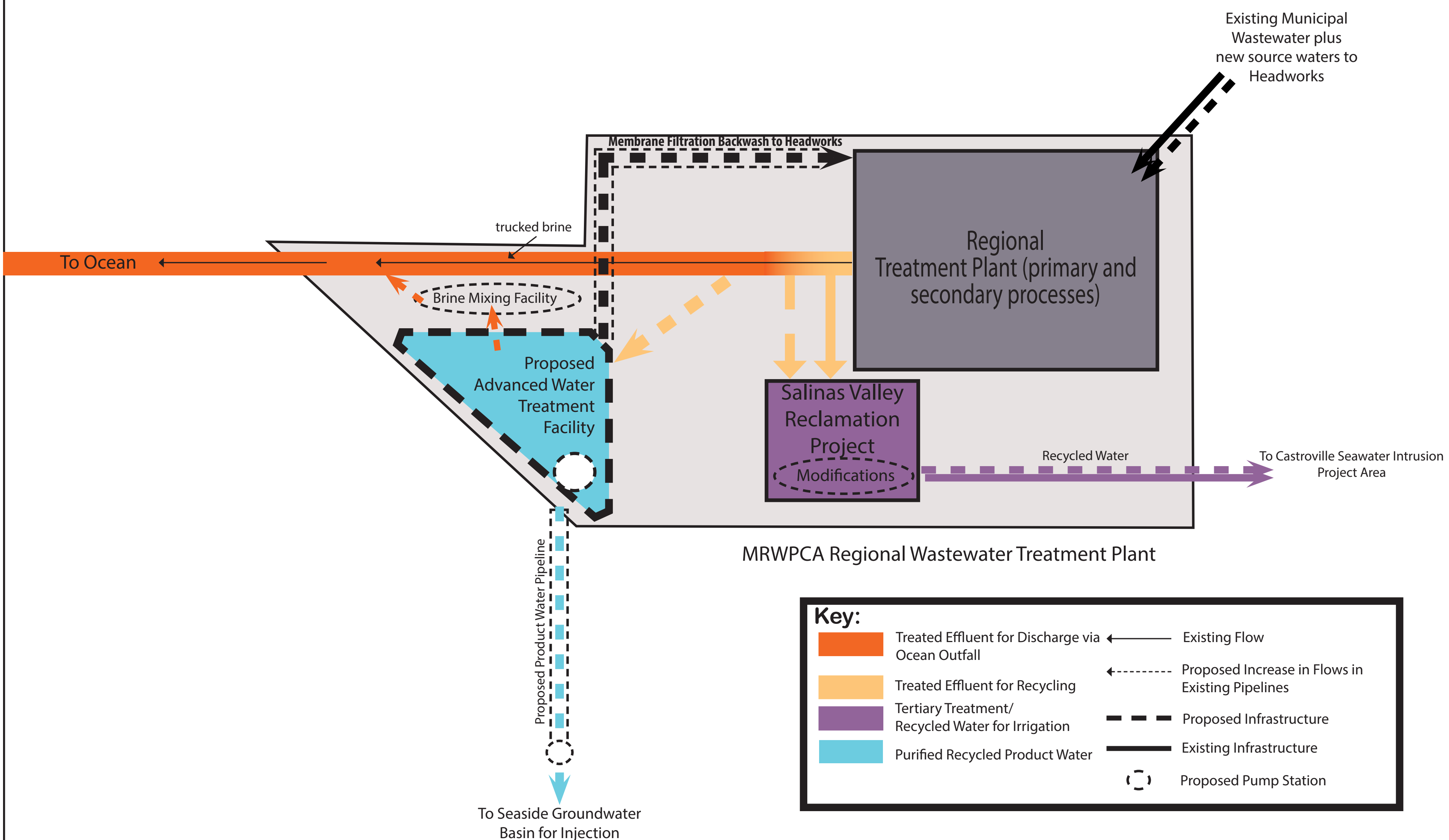
Pure Water Monterey GWR Project
Draft EIR

Figure 2-19



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Proposed Project Flow Schematic - Regional Treatment Plant

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure 2-20

KEY NOTES:

1. REMOVE EXIST. IWW DIVERSION BOX
2. NEW 42"IWW DIVERSION PIPELINE
3. NEW PARSHALL FLUME
4. NEW STORMWATER DIVERSION STRUCTURE NO. 1
5. NEW 18"IWW FORCE MAIN
6. NEW JUNCTION STRUCTURE
7. NEW 18" FORCE MAIN INSIDE EXIST. 33"IWW PIPELINE
8. NEW STORMWATER DIVERSION STRUCTURE NO. 2
9. REHABILITATE EXIST. 30" PIPE FOR STORMWATER DIVERSION
10. NEW STORMWATER DIVERSION PIPELINE TO 42"IWW
11. CONNECT TO EXIST. 42" DIA. STUB-OUT
12. EXIST. MANHOLE TO BE REMOVED
13. CONNECT TO EXIST. MANHOLE

LEGEND

EXISTING MANHOLES
EXISTING STORM DRAIN
EXISTING SANITARY SEWER
EXISTING IWW PIPELINE
NEW PIPING
NEW STRUCTURE

N
0 30' 60'
SCALE: 1"=60'

Source: E2 Consulting Engineers, Inc., 2014

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Proposed Salinas Pump Station Site Plan

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
2-21

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KEY NOTES:

1. NEW POND 3 PUMP STATION INLET BOX
2. NEW POND 3 PUMP STATION WET WELL
3. NEW 18" FORCE MAIN
4. NEW DIVERSION STRUCTURE NO. 3
5. EXISTING PRESSURE M.H. ON 30" LINE
6. NEW 30" GRAVITY MAIN
7. RETURN PUMP STATION WET WELL
8. RETURN PUMP STATION VALVE VAULT
9. NEW FLOW METER VAULT
10. NEW 18" FORCE MAIN INSIDE EXIST. 33" IWW PIPELINE TO SALINAS P.S.
11. EXIST. 42" IWW PIPELINE
12. EXIST. IWW PUMP STATION
13. EXIST. 24" IWW INLET PIPELINE
14. EXIST. 18" IWW OUTLET PIPELINE
15. EXIST. 30" IWW DISTRIBUTION PIPELINE
16. EXIST. INLET TO POND
17. EXIST. RISER MANHOLE
18. EXIST. 24" IWW DISTRIBUTION PIPELINE
19. EXIST. POND INLET STRUCTURE
20. EXIST. POND 3 PUMP STATION
21. EXIST. IRRIGATION BEDS DISTRIBUTION STRUCTURE
22. EXIST. DISTRIBUTION PIPELINES TO IRRIGATION BEDS

LEGEND

- EXISTING MANHOLES
- EXISTING STORM DRAIN
- EXISTING SANITARY SEWER
- EXISTING IWW PIPELINE
- NEW PIPING
- NEW STRUCTURE

0 300' 600'
SCALE: 1"=600'

Source: E2 Consulting Engineers, Inc. 2014

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Industrial Wastewater Treatment Plant Conceptual Site Plan

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Figure 2-22

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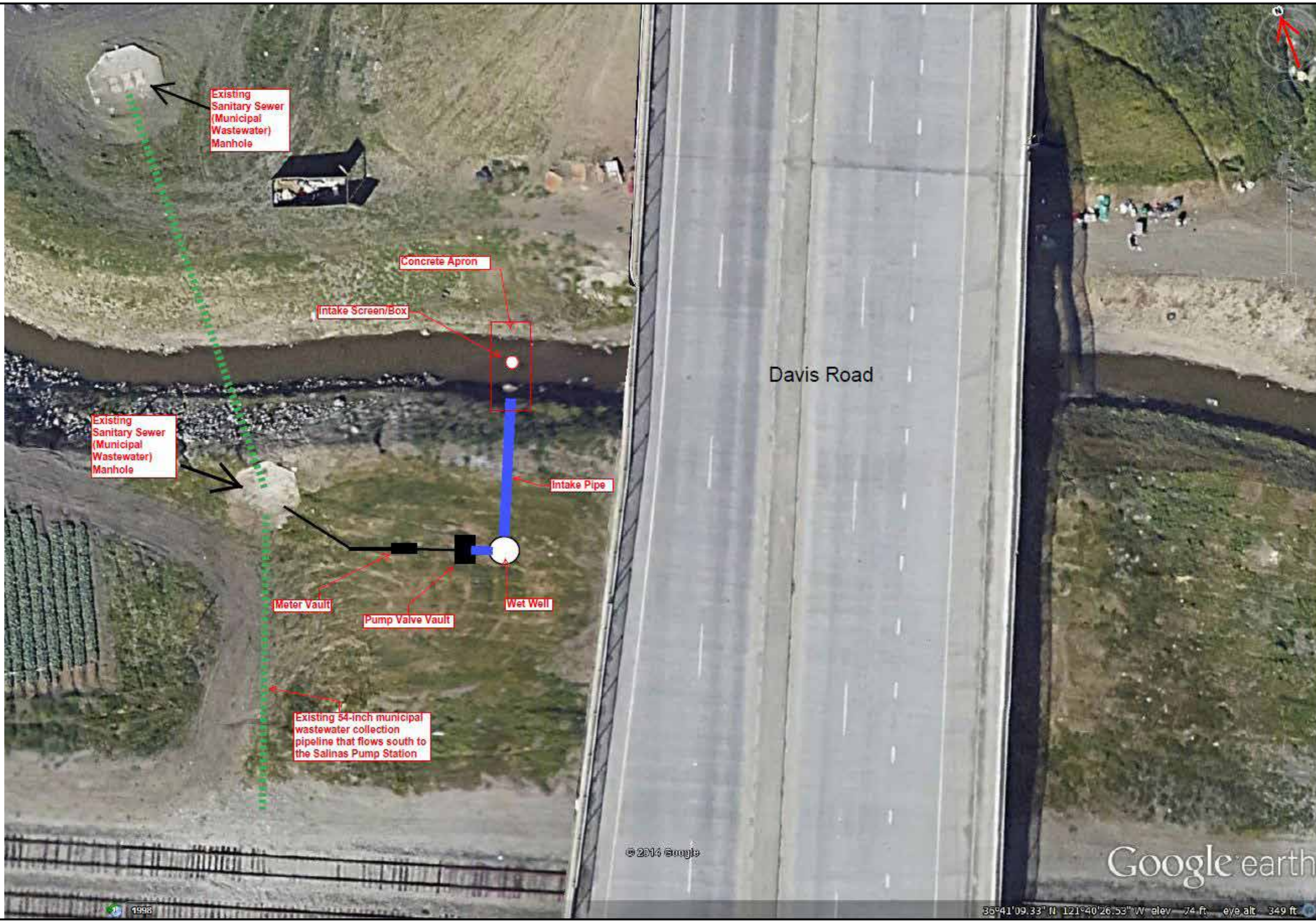

Proposed Reclamation Ditch Diversion Conceptual Plan

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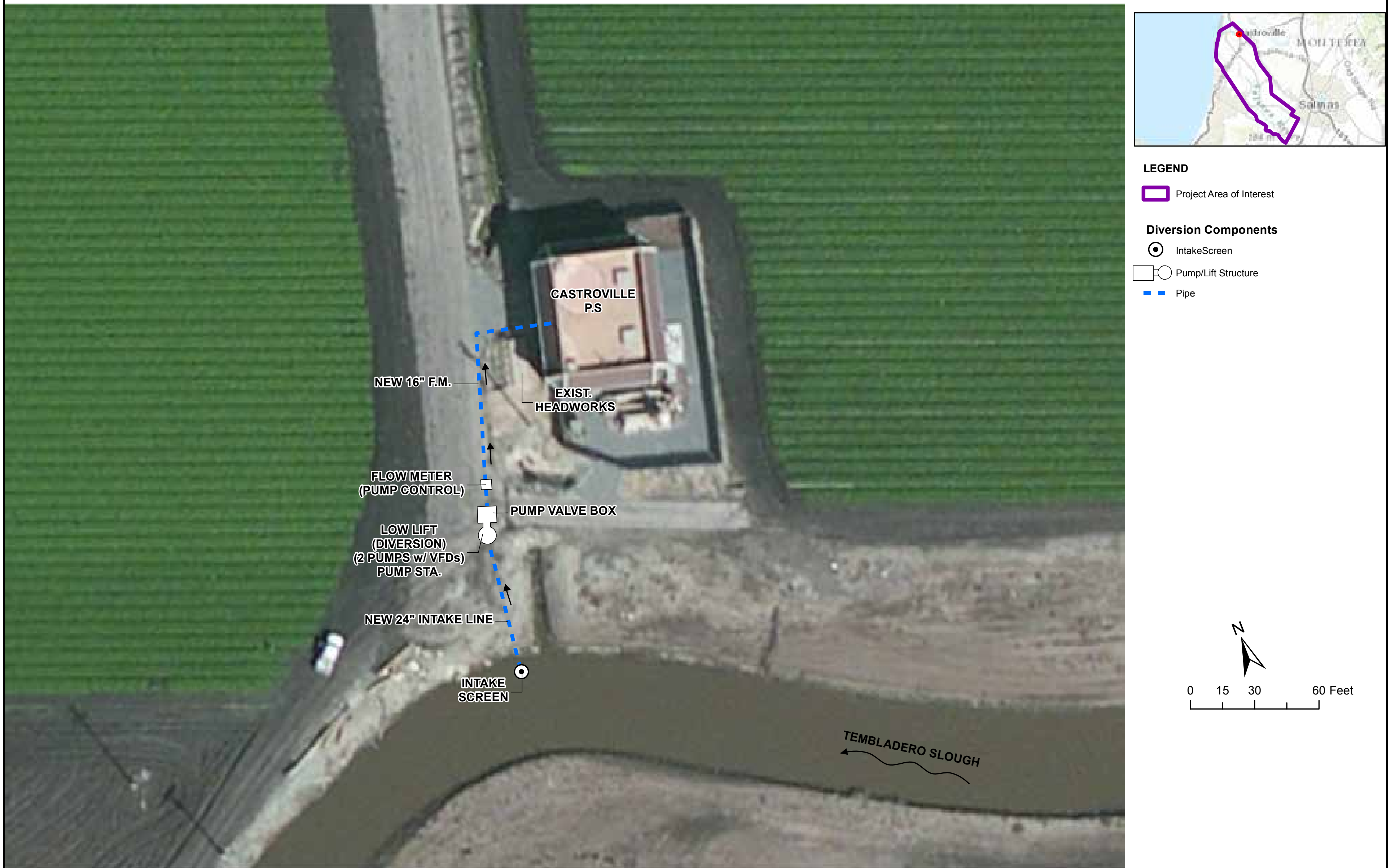
Figure 2-23



Proposed Tembladero Slough Diversion Conceptual Site Plan

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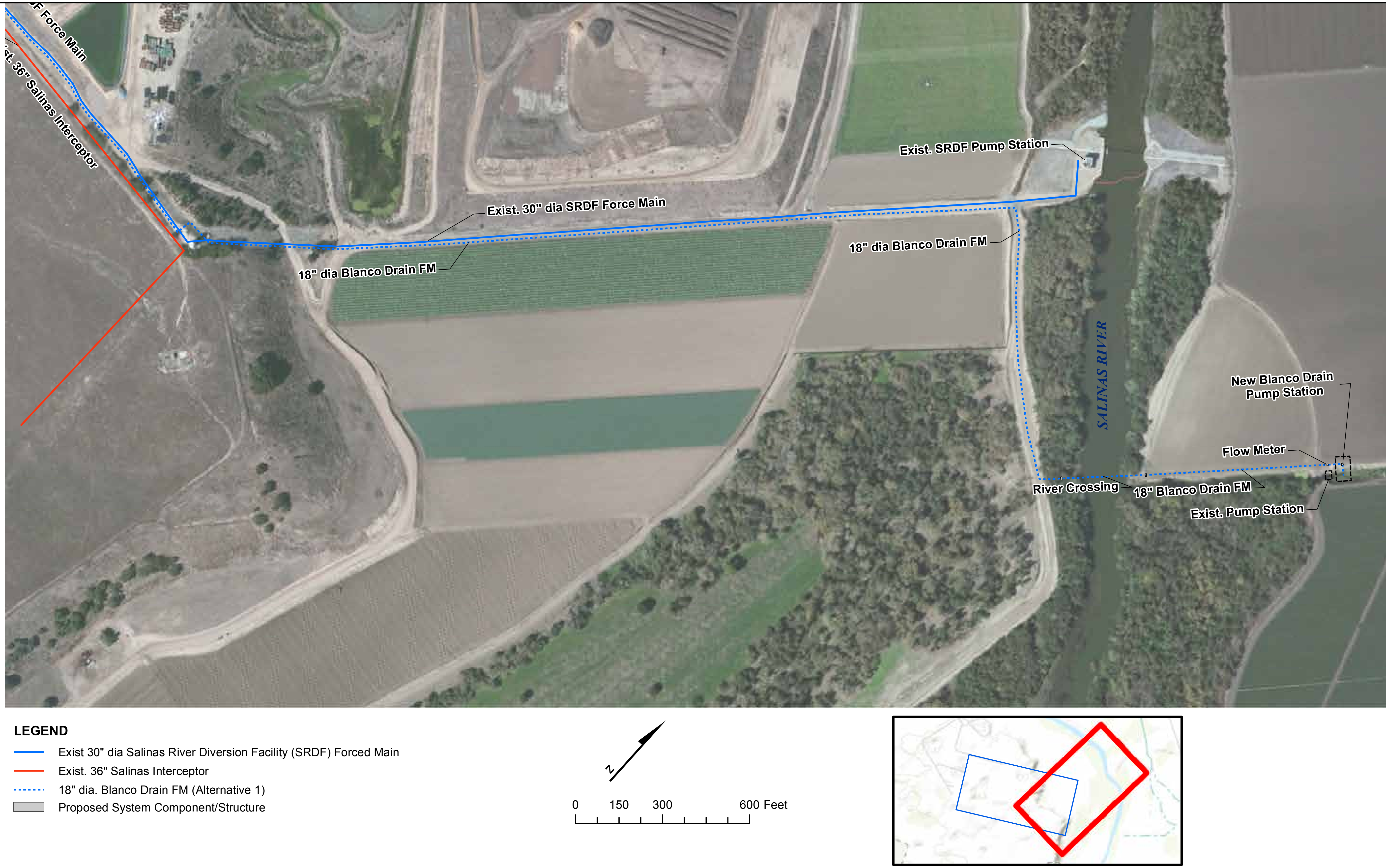
Figure
2-24



Blanco Drain Diversion Conceptual Site Plan - Eastern Portion

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure 2-25a

Blanco Drain Diversion Conceptual Site Plan - Western Portion

April 2015

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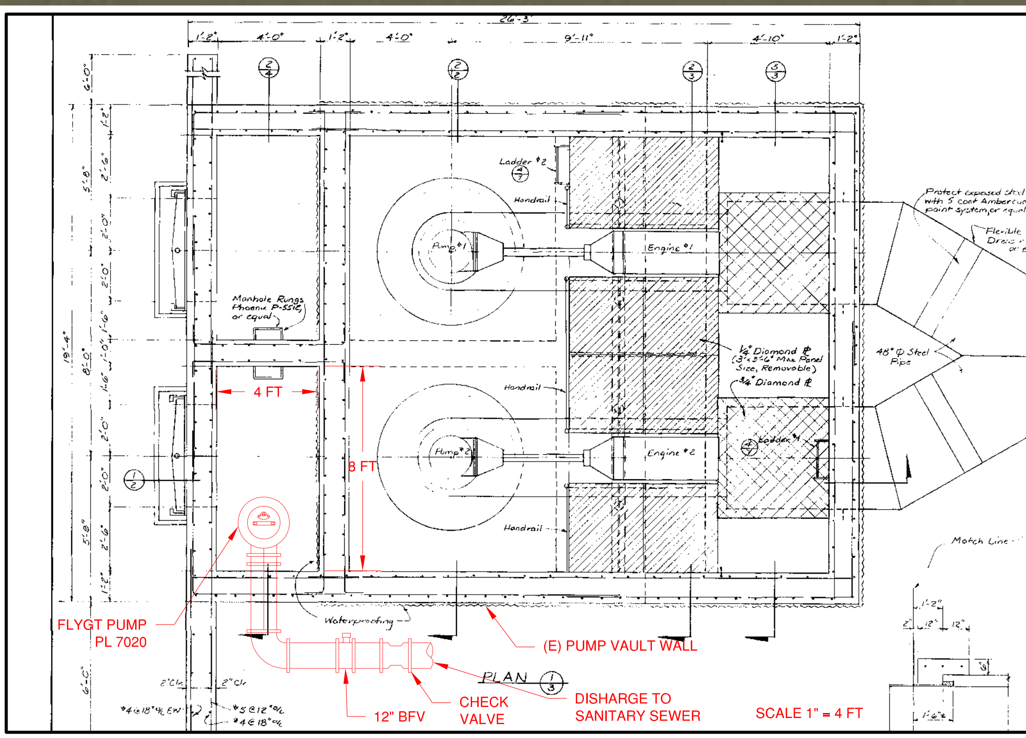
Figure 2-25b



Source: Schaaf & Wheeler, February 2014

Lake El Estero Diversion Conceptual Site Plan and Cross-Section

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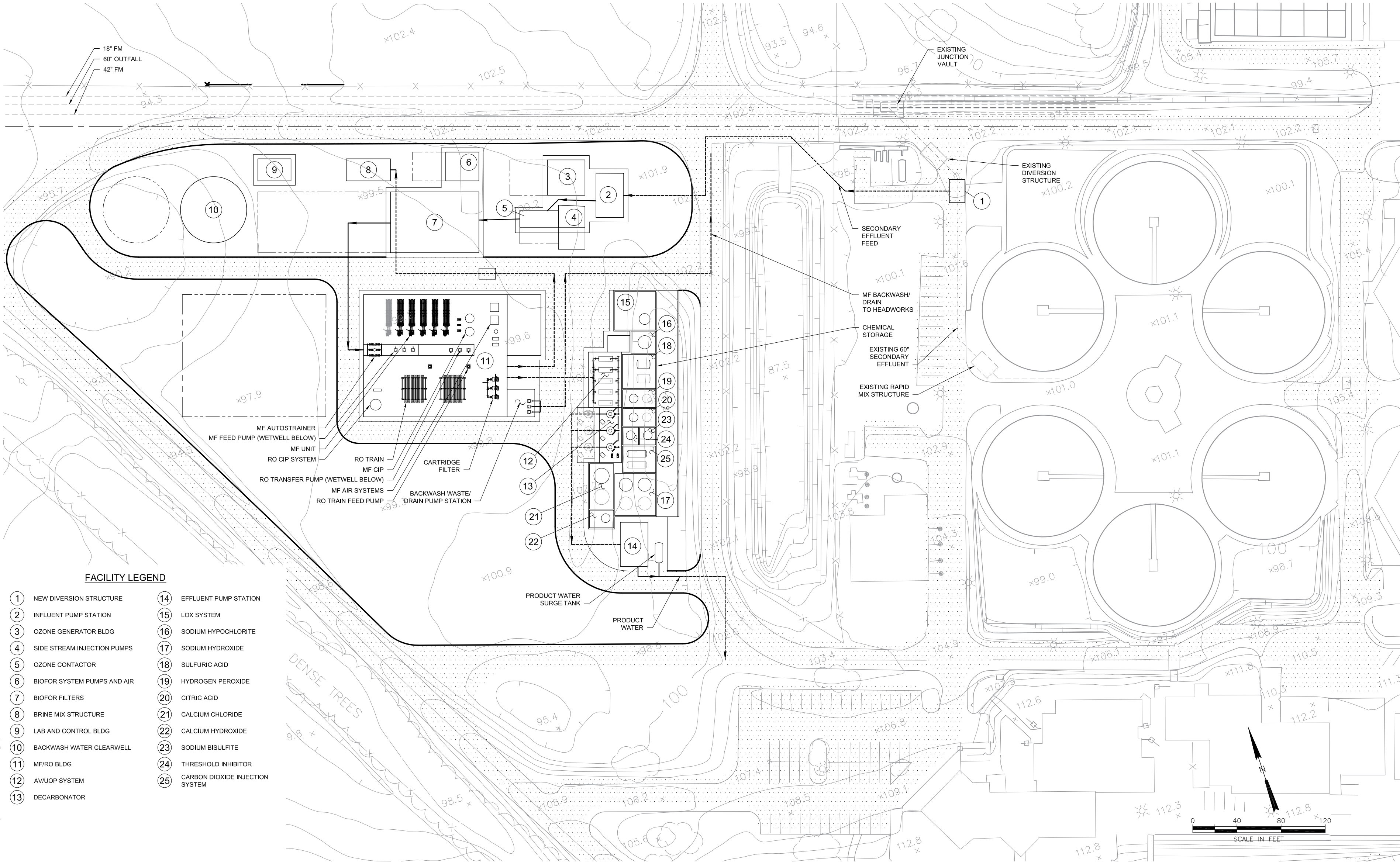
Draft EIR

Figure
2-26



Advanced Water Treatment Facility Conceptual Site Plan

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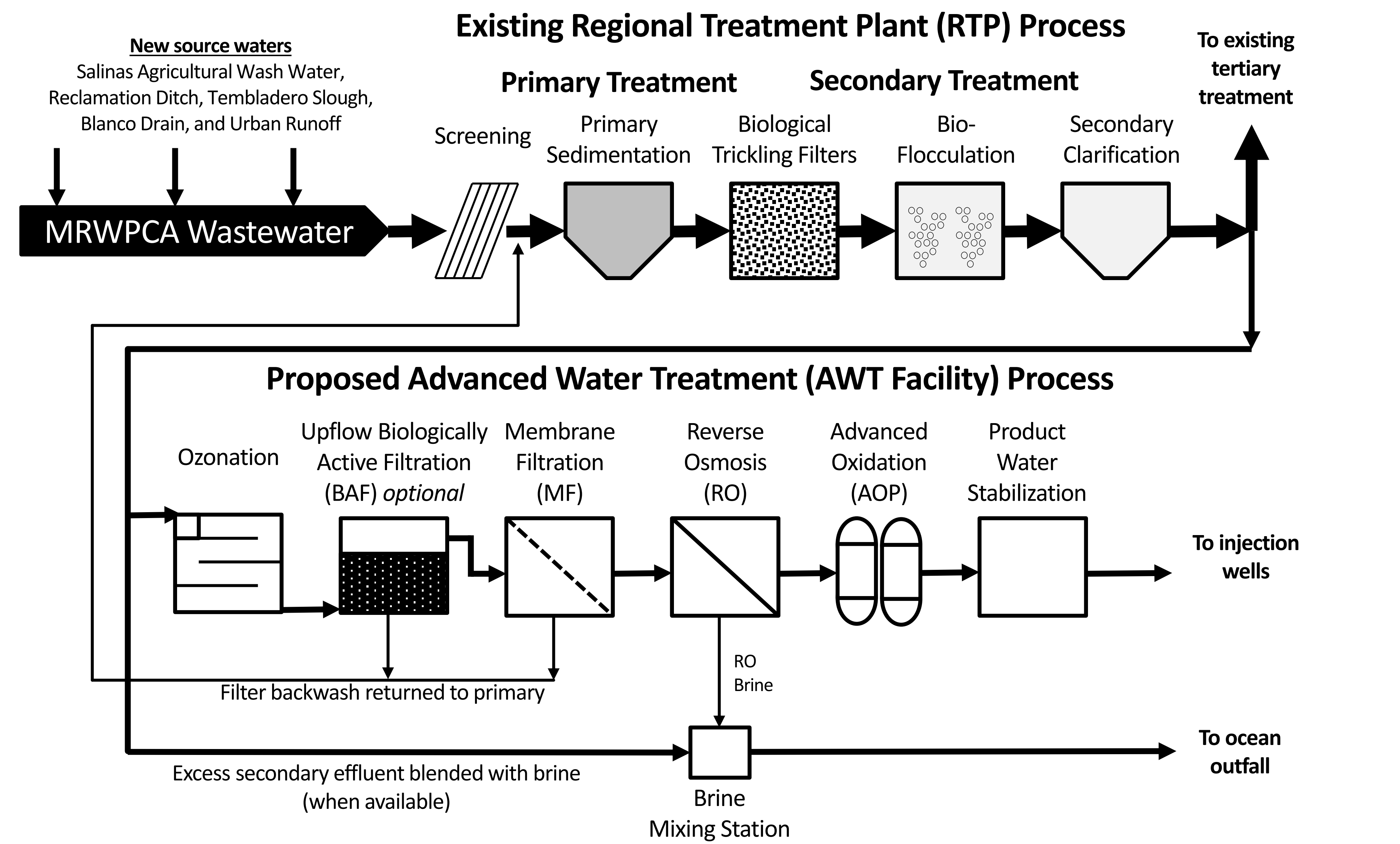
Figure
2-27



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Proposed Advanced Water Treatment Flow Diagram

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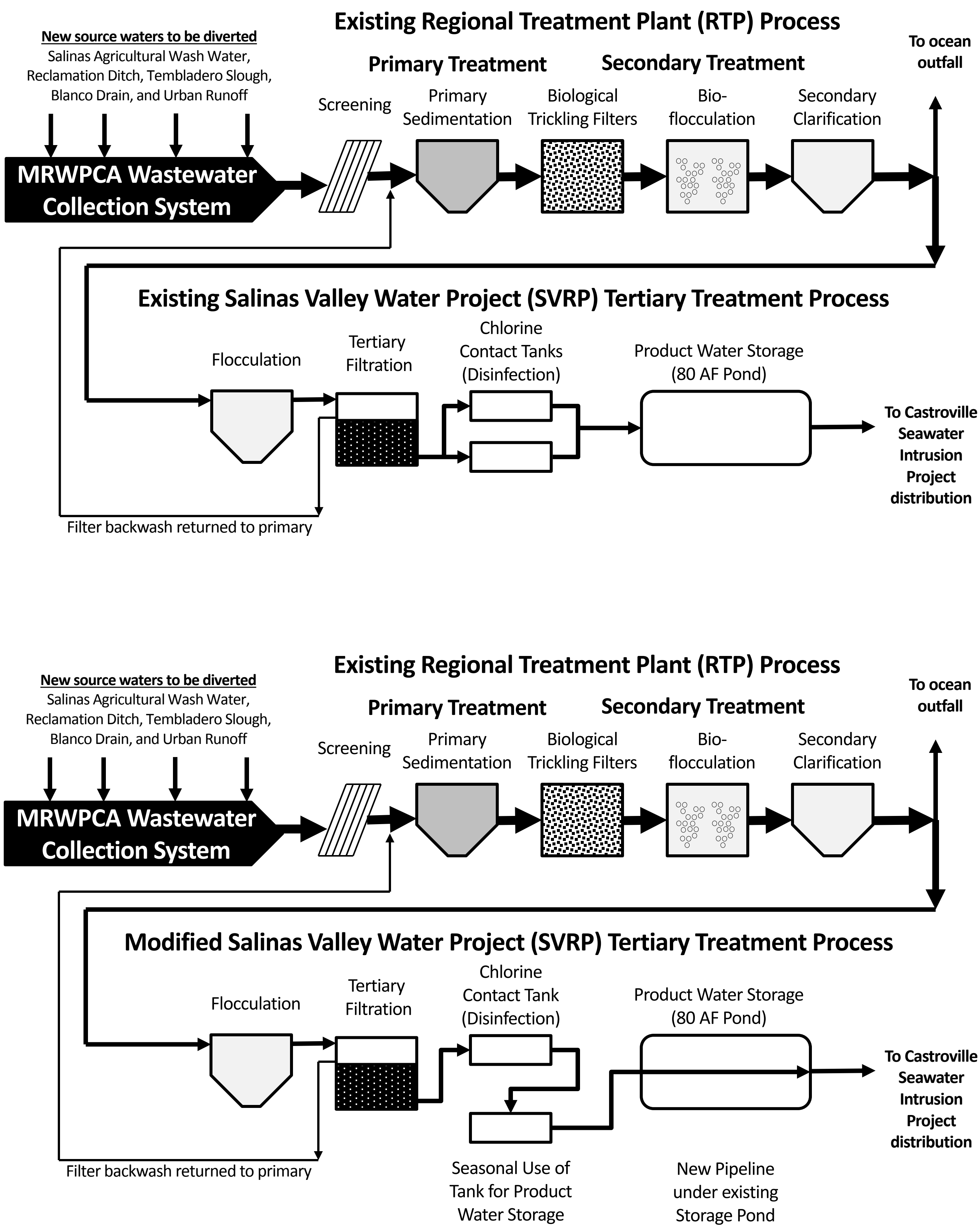
Figure
2-28



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Existing and Proposed Salinas Valley Reclamation Plant Process Flow Diagrams

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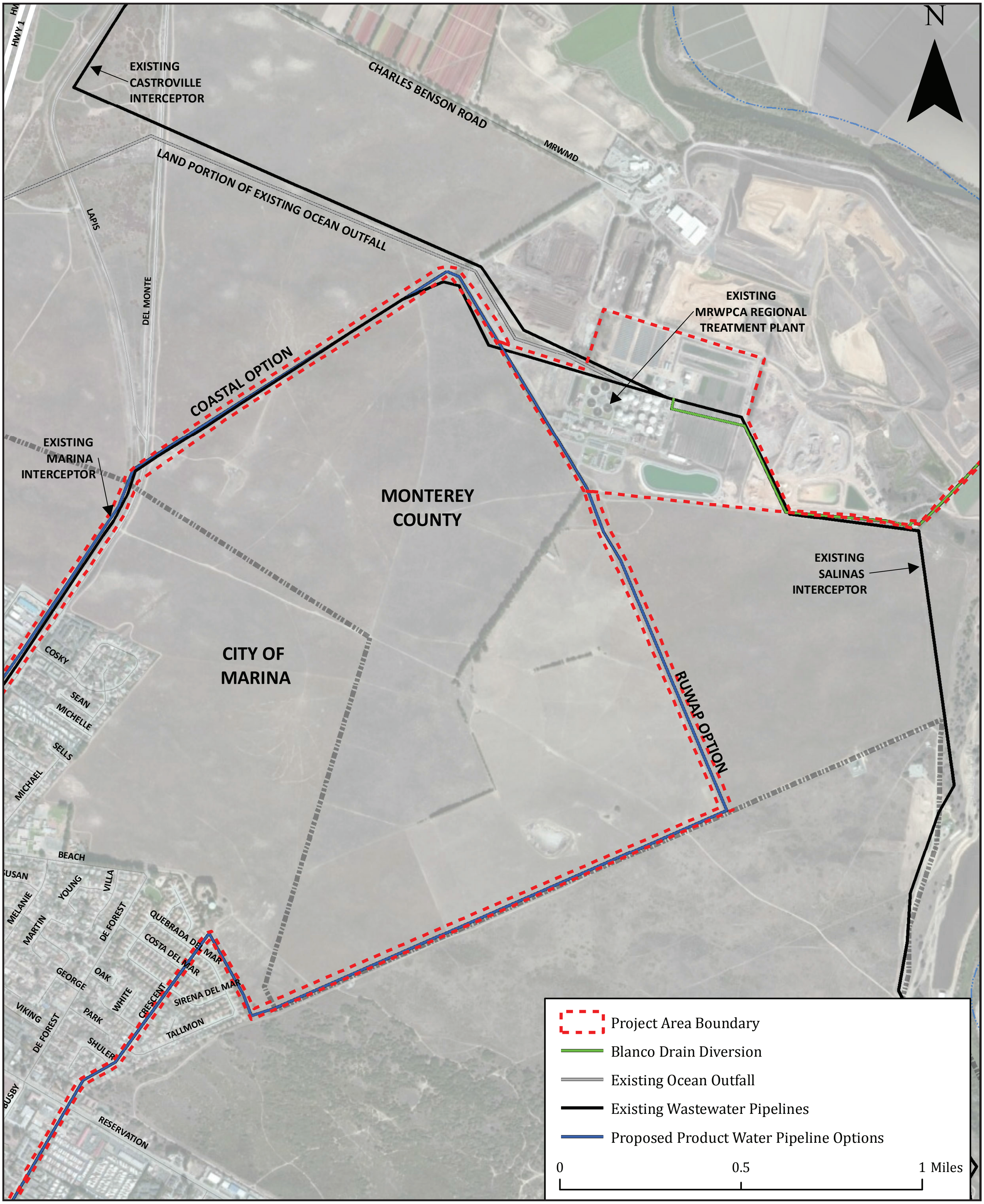
Figure
2-29



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Proposed Product Water Conveyance Options Near Regional Treatment Plant

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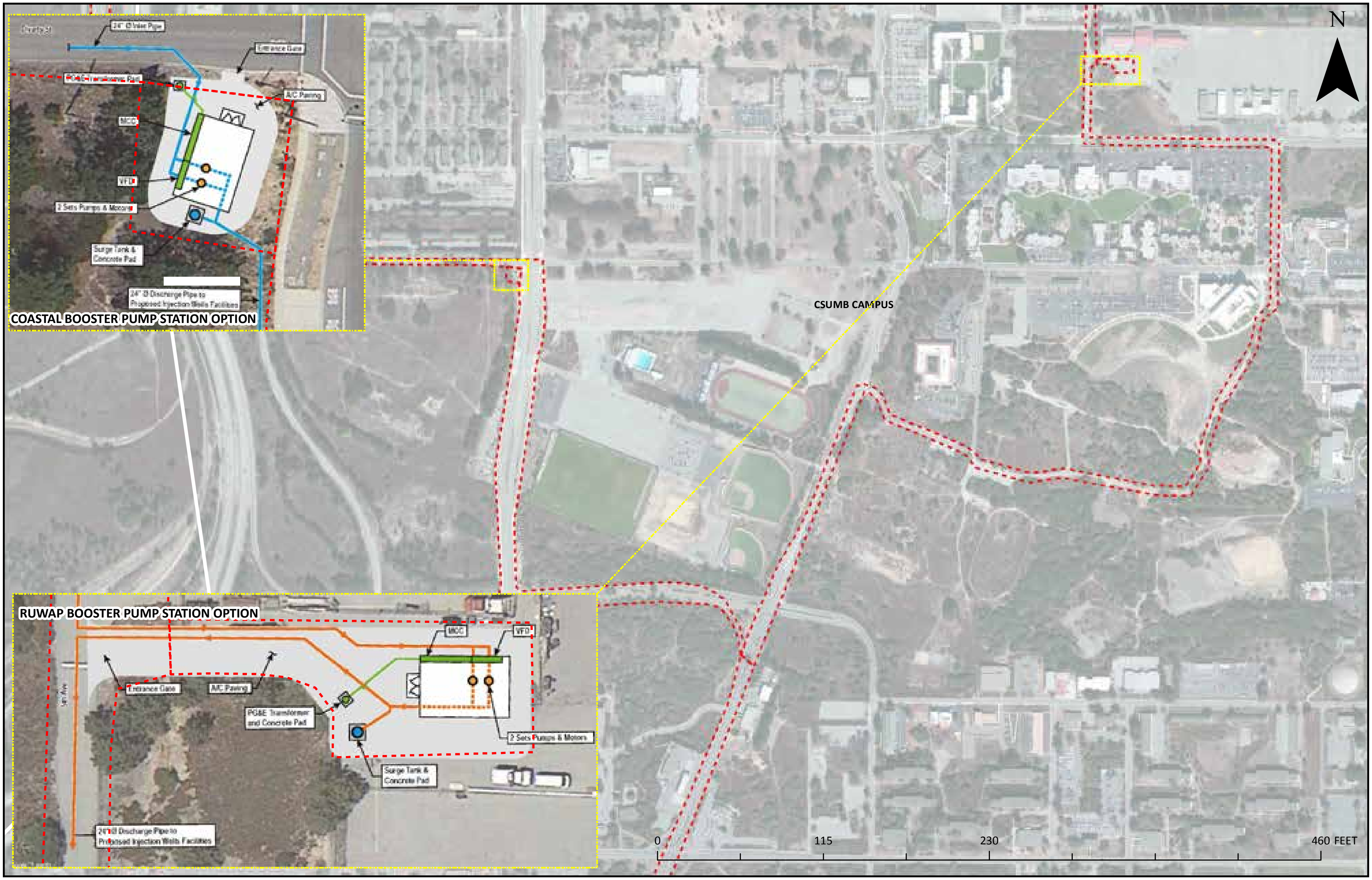
Figure
2-30



Proposed Booster Pump Station Options Conceptual Site Plans

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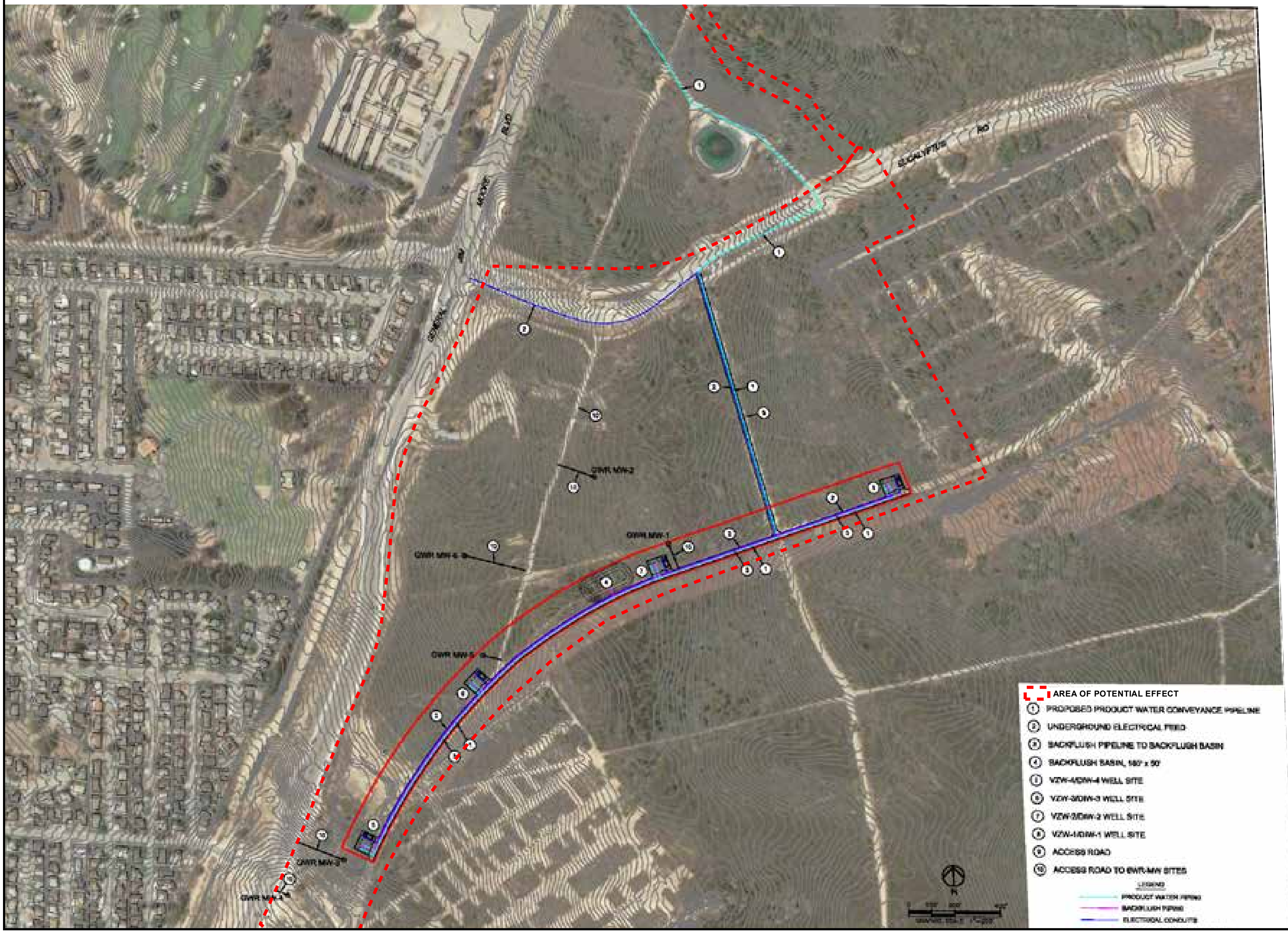
Figure
2-31



Injection Well Site Plan

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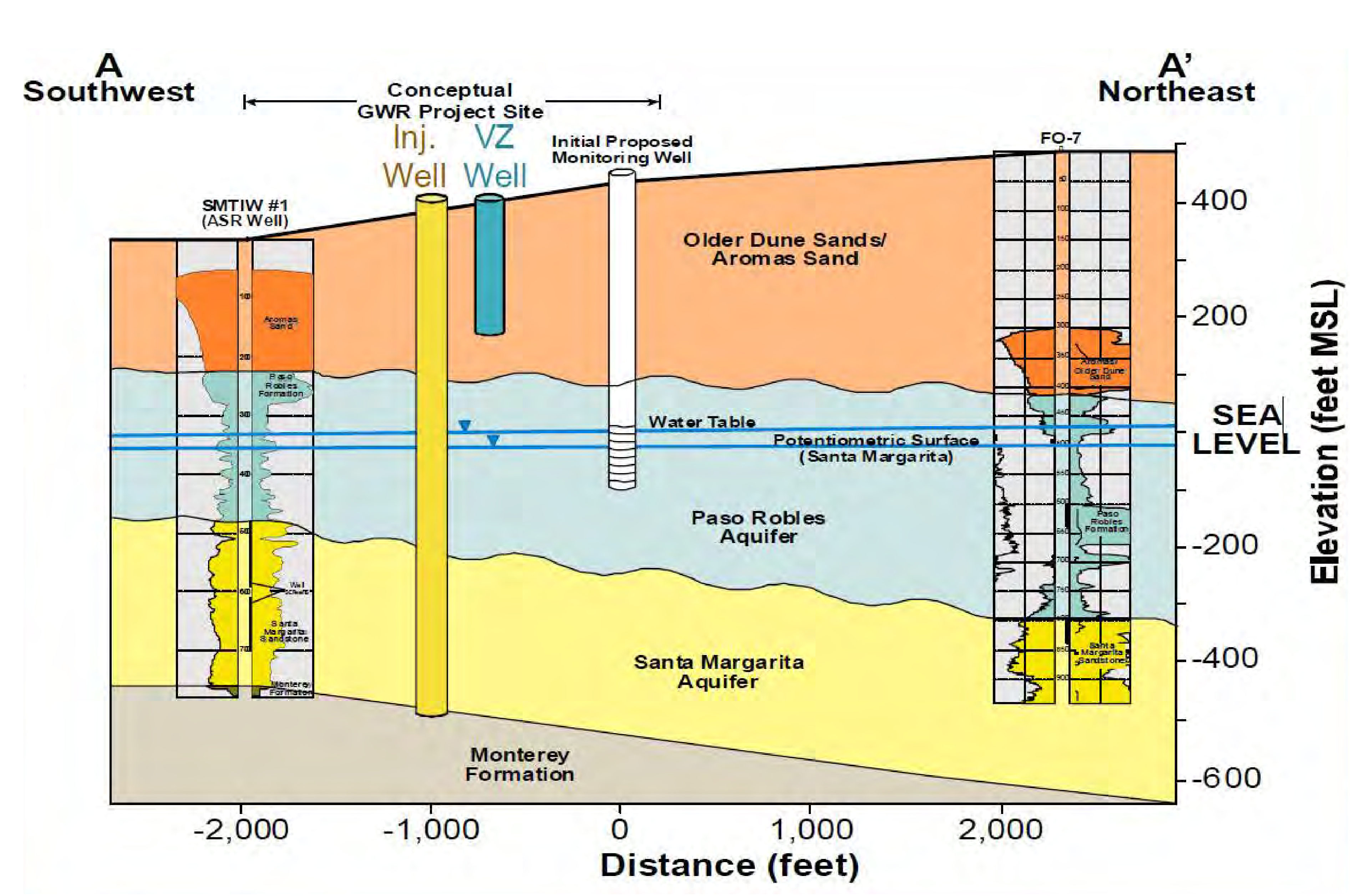
Pure Water Monterey GWR Project
Draft EIR

Figure
2-32



Injection Well Cross Section

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Pure Water Monterey GWR Project
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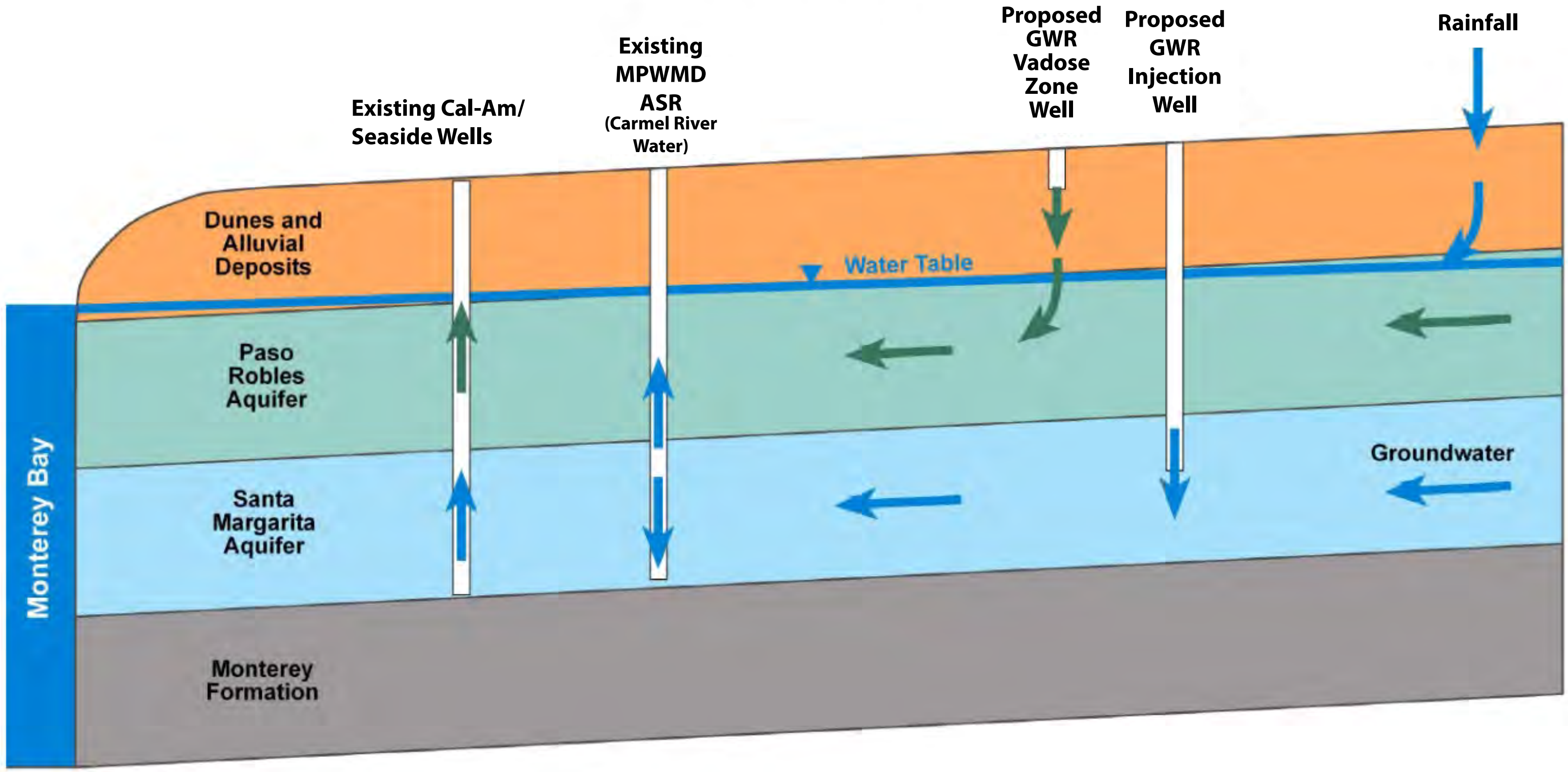
Figure
2-33

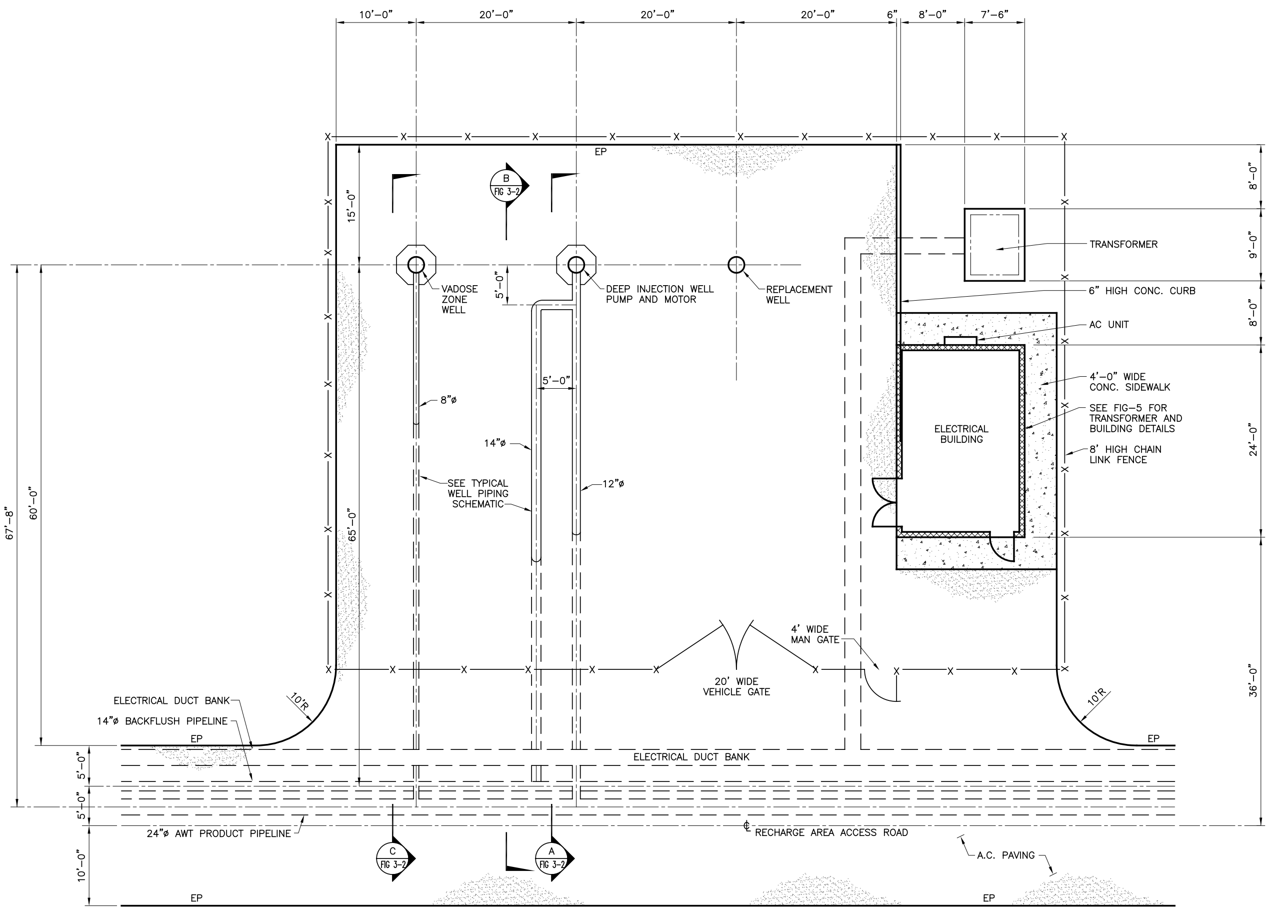


Conceptual Injection Schematic

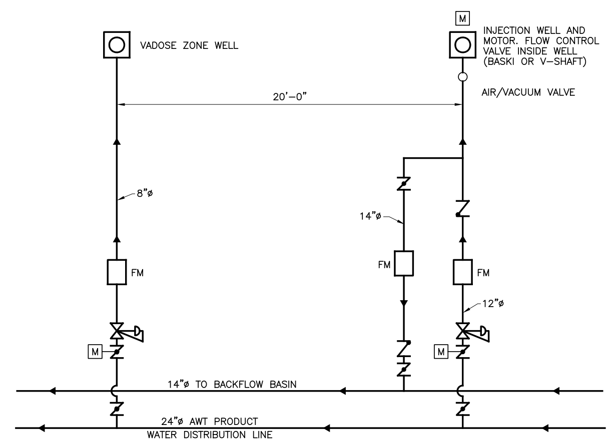
April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure 2-34



TYPICAL WELL SITE PLAN
1/8" = 1'-0"



TYPICAL WELL PIPING SCHEMATIC
N.T.S.

LEGEND

- BUTTERFLY VALVE
- CHECK VALVE
- FM FLOW METER
- FLOW CONTROL VALVE
- M MOTOR

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Conceptual Site Plan and Schematic of Typical Well Cluster

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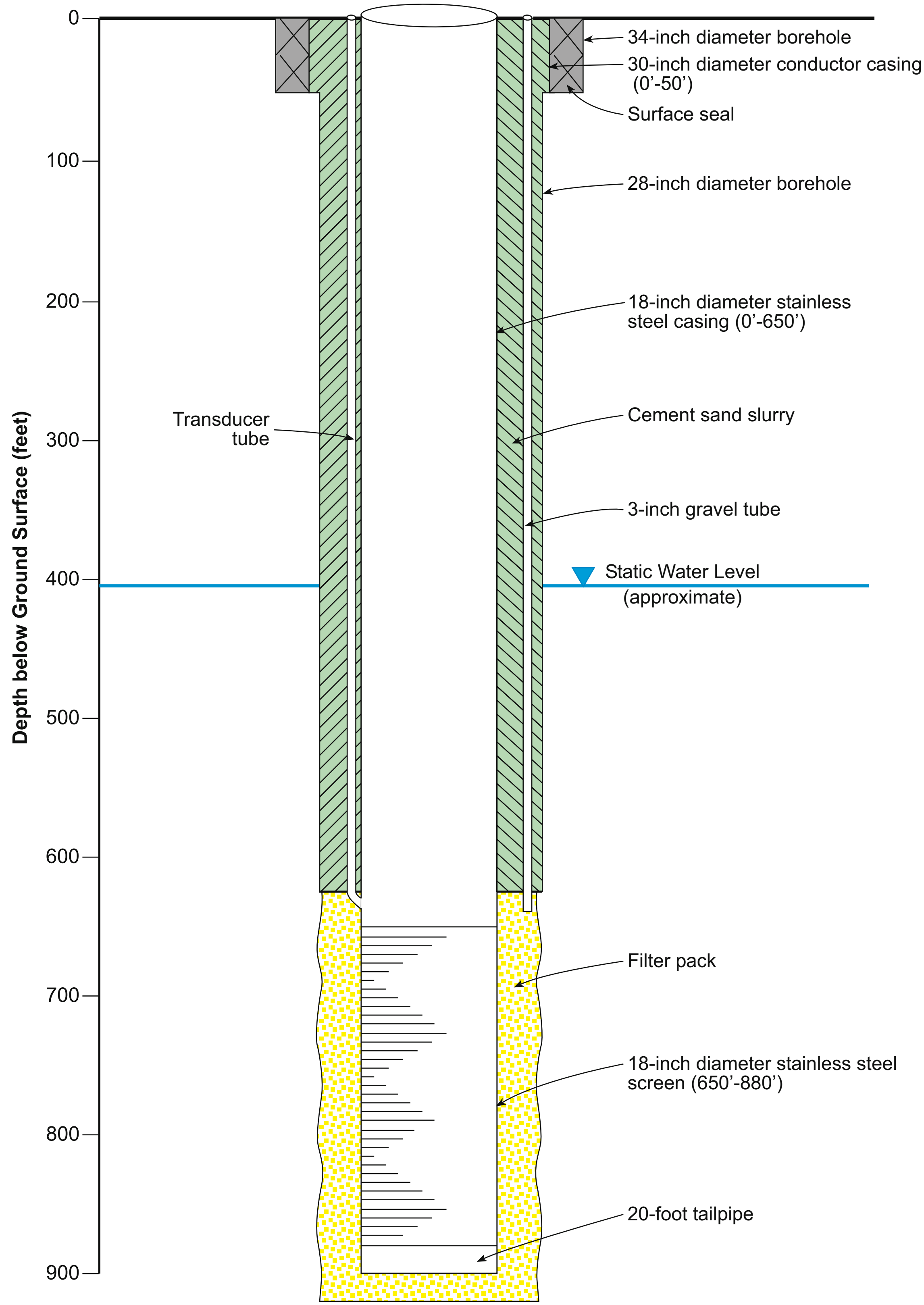
Figure
2-35



Source: Todd Engineers, October 2014

Deep Injection Well Preliminary Design

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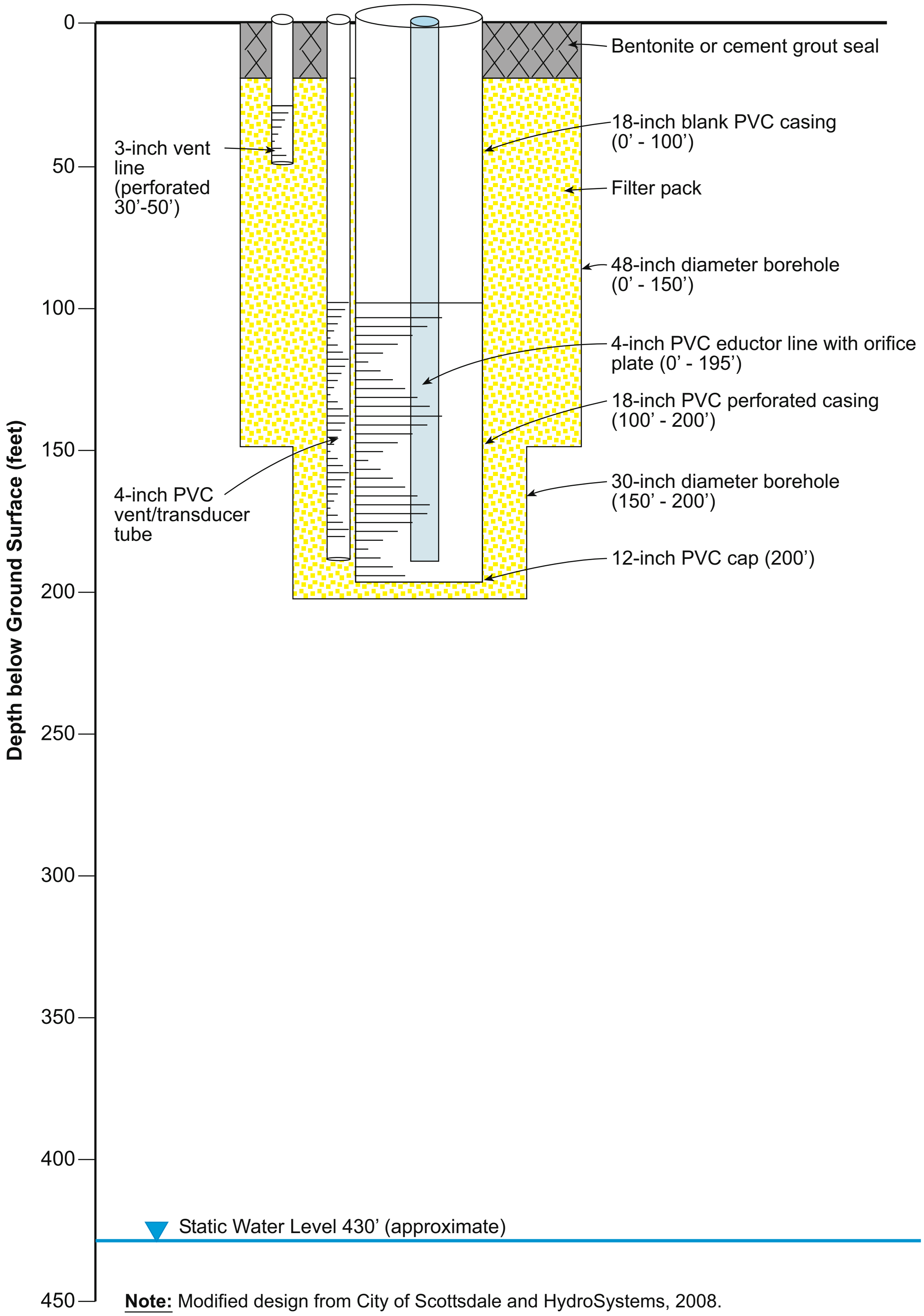
Figure
2-36



Note: Modified design from City of Scottsdale and HydroSystems, 2008.

Source: Todd Engineers, May 2013

Vadose Zone Well Preliminary Design

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Figure
2-37

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CalAm Distribution System Pipeline: Eastern Terminus

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Pure Water Monterey GWR Project
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Figure
2-38

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CalAm Distribution System Pipeline: Western Terminus

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Pure Water Monterey GWR Project
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Figure
2-39

Project Component	General Construction Activities
Salinas Pump Station Site	
including pipes, wet wells/diversion structures, valves, SCADA	Site preparation and Demolition
	Underground vaults and pipes
	Valves, controls and site finishing
Salinas Industrial Wastewater Treatment Facility	
Return Facilities - Sliplining of new Force Main inside existing 33-inch IWW pipeline, on-site piping from Aeration Basin at IWTP to new Reture PS at IWTP and Return PS with Valve and Meter Vaults.	Site preparation and Demolition
	On-site Underground vaults and pipes
	Valves, pumps, controls and site finishing
	Install FM in to Existing 33-inch IWW pipeline to Salinas PS
Storage and Recovery Additions: New Pump station at Pond 3, Pipeline at IWTP to Return PS, and SCADA.	Site preparation and Demolition
	Underground vaults and pipes
	Valves, pumps, controls and site finishing
Reclamation Ditch at Davis Road	
including pipes, pumps, wet wells/diversion structures, valves, and SCADA	Site Preparation
	Underground work, vauts and pipelines
	Valves, controls and site finishing
Tembladero Slough at Castroville Site	
including pipes, pumps, wet wells/diversion structures, valves, and SCADA	Site Preparation
	Underground work, vauts and pipelines
	Valves, controls and site finishing
Blanco Drain Pump Station & Pipeline Site	
including pipes, wet wells/diversion structures, valves, SCADA	Force main pipeline to RTP
	Pump station site prep
	Pump Station underground work, vauts and pipelines
	Valves, controls and site finishing
Lake El Estero Diversion Site	
including new pumps in existing dry well structure, pipeline, valves, SCADA	Site preparation and Demolition
	Underground work, vauts and pipelines
	Valves, controls and site finishing
RTP site (all new / modified facilities)	
AWT Facility (incl. pipelines, diversion structures pretreatment, MF/RO/UV AOP, Brine Mixing Station, Product Water Pump Station)	Site Preparation
	Underground pipelines, vaults, utilities
	Building construction
	Equipment installation, elevtrical and controls
	Final Facility Testing
SVRP Modifications (incl. new pipelines, sluice gates, contact basin mods and controls)	Underground pipelines and structures
	Gates, valves and controls
Product Water Conveyance (southern border of RTP to Injection Well Facilities Site)	
Product Water Conveyance Pipeline	Pipeline Installation
Booster Pump Station (Coastal or RUWAP)	Building Site Preparation
	Underground site piping and vaults
	Building Construction
	Equipment installation, elevtrical and controls
	Final Facility Testing
Injection Well Facilities	
Access Road and Preliminary Grading	Soil stabilization for rig access
Monitoring well (GWR-MW-1 thru GWR-MW-4)	Drill, install, develop, sample
Deep injection well (GWR-DIW-1 thru GWR-DIW-4)	Drill, install, develop,aquifer/injection testing
Vadose zone well (GWR-VZ-1 thru GWR-VZ-4)	Drill, install, test
Motor/Electrical Control Buildings (1 thru 4)	Underground piping, building, equipment install
Backwash Pumps	Install pumps/motors/pipes at wells
Backwash Basin	Grading, compaction, piping, concrete and paving
Pipelines and Conduits	Trenching, pipe installation, backfilling and road surfacing
System test	Final Testing and Clean-Up
CalAm Transfer and Monterey Pipelines	
Transfer Pipeline	Pipeline Installation (150 - 250 feet/day)
Monterey Pipeline	Pipeline Installation (150 - 250 feet/day)

2016: Jun Jul Aug Sep Oct Nov Dec — 2017: Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec — 2018: Jan Feb Mar

Proposed Project Construction Schedule

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure 2-40

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