4.11 HYDROLOGY/WATER QUALITY: SURFACE WATER

4.11.1 Introduction

The analysis of hydrology and water quality is separated into two sections in this EIR. This section addresses surface water hydrology and water quality, including marine water quality. In this section, existing conditions related to surface water hydrology and water, drainage systems, and flood and inundation hazards are described. In addition, applicable regulations governing water quality, drainage, and flood hazards are presented. Potential impacts resulting from construction and operation of the Proposed Project on surface and marine hydrological resources are assessed. The study area for this section includes the Salinas River (including the Reclamation Ditch watershed), Carmel River, and Lake El Estero watersheds and the Monterey Bay and Pacific Ocean. **Section 4.10, Hydrology and Water Quality: Groundwater**, addresses groundwater hydrology and water quality, including recharge and surface water/groundwater interaction characteristics of the groundwater basins. The analysis of how potential changes in ocean water quality would impact marine benthic species is discussed in **Section 4.13, Marine Biological Resources**.

Public and agency comments related to surface water and marine hydrology and water quality that were received during the public scoping period in response to the Notice of Preparation public are summarized below:

- Existing and pending regulatory requirements for dry and wet weather storm flows to Regional Treatment Plant.
- Discharge of reject concentrate into Monterey Bay or removal of pollutants from the receiving water (Monterey Bay).
- The quality of water sent to the outfall location as opposed to that of the water sent to Seaside for injection.
- Industrial and environmental hygiene.

To the extent that issues identified in public comments involve potentially significant effects on the environment according to the California Environmental Quality Act (CEQA) and/or are raised by responsible agencies, they are identified and addressed within this EIR. For a complete list of public comments received during the public scoping period, refer to **Appendix A, Scoping Report**.

4.11.2 Environmental Setting

This section addresses natural drainages and water bodes (rivers and sloughs) and man-made drainages (agricultural ditches drainages and urban stormwater systems). The geographic area for these water systems, and thus the project area of impact for this topic is northern Monterey County, including the watersheds of the Salinas River (and the inter-related watershed of the Gabilan Creek/Reclamation Ditch system that includes the watersheds that feed the Tembladero Slough and Blanco Drain), and smaller more urban watersheds in the Monterey Peninsula area. The study area for the analysis of impacts to surface water hydrology and water quality includes the following surface water bodies in the Proposed Project area:

- Salinas River between the City's stormwater outfall pipeline near the Davis Road Salinas River Bridge and the Salinas River lagoon,
- The portion (700 linear feet) of Blanco Drain just upstream of its confluence with the Salinas River,
- Reclamation Ditch below Davis Road overcrossing down to its confluence with the Tembladero Slough,
- Tembladero Slough from the confluence with the Reclamation Ditch to the confluence with the Old Salinas River channel,
- Old Salinas River Channel between the Old Salinas River Channel gated outlet and the Potrero Tide Gate near Moss Landing Harbor,
- Moss Landing Harbor and Elkhorn Slough,
- Smaller watersheds within the cities of Marina, Seaside, Sand City, Monterey, and Pacific Grove (including the Lake El Estero watershed),
- Carmel River watershed and Carmel Bay (due to the Proposed Project objective of reducing Cal-Am pumping of the Carmel River alluvial aquifer), and
- Monterey Bay and Pacific Ocean.

4.11.2.1 Climate and Precipitation

The Proposed Project area is located along the western margin of the Coast Range and the climate is dominated by the Pacific Ocean. The project area is characterized by moderate coastal climate with mild, wet winters and generally dry summer days, which are often overcast or have coastal fog and cool temperatures. The average temperature is approximately 60 degrees Fahrenheit. Rainfall occurs primarily between November and April. Average rainfall in Salinas is approximately 13 inches per year, approximately 90% occurring between November and April. The average rainfall in other areas of the county varies, but is approximately 18 inches per year.

4.11.2.2 Watersheds and Water Bodies

As shown in **Figure 4.11-1,** Proposed Project facilities would be located in and would involve water resources spanning several watersheds, including the Salinas River watershed and the Reclamation Ditch watershed, which includes various creeks, ditches and sloughs, including Alisal Creek, Santa Rita Creek, Gabilan Creek, Tembladero Slough, and Old Salinas River Channel. In addition, Proposed Project components would be located within, and would utilize runoff from, smaller watersheds that drain to the Monterey Bay in the Monterey Peninsula area, including Lake El Estero's watershed. This section describes these surface water features and their relationship to the Proposed Project. **Figure 4.11-1, Watersheds and Surface Water Bodies in the Proposed Project Area,** provides an overview of the surface water bodies and watersheds relevant to the Proposed Project. **Figure 4.11-2** shows the Salinas Valley Watershed. **Figure 4.4-1** and **Figure 4.4-2**, in **Section 4.4, Biological Resources: Fisheries**, show the northern Salinas Valley water bodies and the Reclamation Ditch watershed, respectively, with key Proposed Project components.

Salinas River

Watershed

The Salinas River is the largest water system in the county and is the largest river of the Central Coast of California, running 170 miles and draining 4,160 square miles. It has three main tributaries: the Nacimiento, San Antonio, and Arroyo Seco Rivers. The Salinas River originates near the town of Santa Margarita in San Luis Obispo County and flows north-northwest through Monterey County and into the Monterey Bay (directly or via the Old Salinas Channel to the Moss Landing Harbor). 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. See **Figure 4.11-2**.

The San Antonio and Nacimiento Rivers are by far the largest tributaries to the Salinas River, with watersheds of about 330 and 328 square miles, respectively. Dams owned and operated by the Monterey County Water Resource Agency control both of these rivers and create the reservoirs with the same name. The San Antonio River has its headwaters in the Santa Lucia Mountains and flows in a southeasterly and easterly direction through the Los Padres National Forest and Fort Hunter Liggett Military Base to its confluence with the Salinas River, for a total length of 58 miles. The Nacimiento River, located about five miles southwest of the San Antonio River, originates in the Santa Lucia Mountains and flows southeasterly through the Los Padres National Forest, Fort Hunter Liggett, and Camp Roberts to its confluence with the Salinas River, for a total length of 54 miles. Nacimiento and San Antonio Rivers contribute approximately 200,000 acre-feet/year (AFY) and 70,000 AFY, respectively, to the Salinas River.

The Nacimiento Reservoir's storage capacity is 377,900 AF with a surface elevation of 800 feet and the reservoir yields on average about 62% of the total water in the Salinas River system. The San Antonio Reservoir has a capacity of 335,000 AF with a surface elevation of 780 feet, and yields on average about 13% of the total water in the Salinas River system.

Several other tributaries enter the Salinas River below the reservoirs, including Pancho Rico Creek, Santa Rita Creek, Estrella Creek, Chalone Creek, San Lorenzo Creek, El Toro Creek, Prunedale Creek, Arroyo Seco River, Nacimiento River, and San Antonio River. The Arroyo Seco River is the largest undammed tributary to the Salinas River and is an important source of groundwater recharge to the Salinas Valley Groundwater Basin. The river is 40 miles long and drains 275 square miles of watershed, most of which lies in the rugged coastal range areas southwest of Greenfield and Soledad. The dramatic topographical relief of its drainage area and the fact that there are no dams on the Arroyo Seco make the river prone to flash flooding. The river is therefore significant for Salinas River flood management. Watersheds bordering the Arroyo Seco drainage are the Carmel River and Big Sur River to the northwest, multiple small creeks flowing into the Pacific on the west, the San Antonio River to the south, and other smaller tributaries of the Salinas River on the east.

The Monterey County Water Resources Agency (MCWRA) regulates flows in the Salinas River through operation of the Nacimiento and San Antonio dams, maintains an ALERT warning system (http://www.mcwra.co.monterey.ca.us/flood_warning/ALERT_system.php) to monitor flow rates along the Salinas River, and maintains many of the irrigation ditches and channels that drain the Salinas Valley. Both riparian vegetation and sediment deposits (sandbars) reduce the overall water conveyance capacity of the Salinas River, and make it prone to flooding during higher flow storm events (MCWRA, 2014).

The Proposed Project components would be located at the northernmost and lowest topographic reaches of the Salinas River watershed. The Salinas River has two points of discharge into the Monterey Bay. During the periods when the Salinas River flows are lower (i.e., all summer months and most spring and fall months), the Salinas River flows into the Old Salinas River Channel through a gated culvert on the northern side of the Salinas Lagoon (see **Figure 4.11-2**). Direct discharge to the ocean is blocked by a seasonal sand bar which forms across the mouth of the Salinas Lagoon due to wave and tidal action in the Monterey Bay. The Old Salinas River Channel is controlled by tide gates at Potrero Road in Moss Landing. River flow combines with Tembladero Slough flow approximately 1.2 miles upstream of the tide gates. During high winter flows in the Salinas River, the sand bar breaches and the river flows directly to the Bay. When this occurs, the MCWRA closes the slide gate to the Old Salinas River to prevent flooding of properties north of the river. Aerial photography of the lagoon under both conditions is provided in **Figure 4.11-3**.

Salinas River Hydrology

The U.S. Geological Survey operates a stream flow gage on the Salinas River below Spreckels, approximately 3-miles upstream and east of Davis Road, the closest gage to the Proposed Project facilities. Daily flow readings are available from October 1, 1929 to present. Average annual flows to the ocean from the Salinas River are around 259,300 AFY for the period 1942 through 2013, most of which occurs during the period of November through March. This period corresponds to the months of peak seasonal rainfall and coincides with a seasonal reduction in irrigation activities in the valley. During the spring and summer months, the reservoirs on the Nacimiento and San Antonio Rivers regulate flow to maximize groundwater recharge along the Salinas River channel. A natural clay layer (or aquitard) underlies the river in the northern portion of the valley, which inhibits natural recharge in this area. The recharge characteristics of the northern Salinas Valley are described in more detail in **Section 4.10, Hydrology and Water Quality: Groundwater**. Since April 2010, Salinas River flows are managed as part of the Salinas Valley Water Project, which is described below.

Salinas Valley Water Project/Salinas River Diversion Facility

The Salinas Valley Water Project was completed in 2010 with the goal to halt seawater intrusion to aquifers, to provide water for current and future needs, and to improve the hydrologic balance of groundwater within the basin. Groundwater is the source for most urban and agricultural water needs in the Salinas River Valley. A historic imbalance between groundwater withdrawal and recharge caused overdraft conditions and seawater intrusion into the aquifer. The San Antonio and Nacimiento reservoirs were constructed in 1965 and 1957, respectively, partly to address overdraft within the basin. The Salinas Valley Water Project is a combination of structural and operational changes to the operation of these reservoirs to provide surface water deliveries and aquifer replenishment. The Salinas Valley Water Project includes the Salinas River Diversion Facility located approximately 4.8 miles from the ocean on the Salinas River (halfway between the Blanco Drain and the Highway 1 Bridge). This facility consists of a rubber bladder dam that is inflated to impound spring, summer and early-fall reservoir releases, and a pump station to deliver this diverted surface water to agricultural irrigators and to reduce the need for groundwater pumping. The Salinas Valley Water Project also includes changes to the manner in which releases from the San Antonio and Nacimiento dams are operated.

As a condition of operating the Salinas River Diversion Facility, the MCWRA must maintain certain in-stream flows in the Salinas River. When San Antonio and Nacimiento Reservoirs have a combined storage of 220,000 AF, the Salinas River Diversion Facility has a requirement to release (1) a minimum of 15 cfs downstream from April 1 to June 30, and (2) a minimum of 2 cfs downstream from July 1 to the end of the Salinas River Diversion Facility operating season for maintenance of downstream Salinas River Lagoon habitat. Higher block flow releases are triggered during steelhead migration season if the Salinas Lagoon is open to the ocean. When the combined storage in the two reservoirs is under 220,000 AF, the minimum release requirement is 2 cfs while the Salinas River Diversion Facility is in operation.

City of Salinas Runoff to the Salinas River

The City of Salinas receives an average of 13 inches of rain each year. Four major creeks and several minor tributaries pass through the Salinas area and receive stormwater discharges from the City northeast of and adjacent to Highway 101. As shown on **Figure 4.11-4** as "SR," stormwater from southern portions of the City is collected in a storm drain system that flows south toward the Salinas River. This stormwater collection system terminates at a pump station on the City of Salinas' former wastewater treatment plant site (called "TP1") property, which discharges the stormwater to the Salinas River southeast of Davis Road via a 66-inch pipeline. **Figure 4.11-5** shows the location of these facilities. The stormwater pump station has a peak flow capacity of 110 cfs. In larger storm events, excess flows that cannot be discharged through the 66-inch pipeline to the river, overflow to the on-site Blanco Detention Pond. The portion of the City that drains to the Salinas River is approximately 1,631 acres, or 2.55 square miles. The average annual runoff from this area to the Salinas River is estimated at 242 AFY (Schaaf & Wheeler, 2014b).

Salinas Industrial Wastewater Treatment Facility

The City of Salinas operates the Salinas Industrial Wastewater Treatment Facility (herein referred to as the Salinas Treatment Facility). It serves 25 agricultural processing and related businesses located in the southeast area of the city. Industrial wastewater (washwater from processing/packaging agricultural products) is collected and conveyed separately from municipal wastewater and treated at the Salinas Treatment Facility located along the Salinas River northwest of Davis Road (see **Figures 2-9** and **2-10** in **Chapter 2, Project Description**, for a Salinas Treatment Facility process schematic and location, respectively). The Salinas Treatment Facility consists of an aeration pond for treatment of incoming water and three large percolation ponds that dispose of water by percolation and evaporation, with most water seeping through the upper most substrate into the river and contributing to river flows. Additional disposal capacity during the high-inflow season (approximately May through October) is provided by drying beds and by rapid infiltration basins (RIBs) between the main ponds and the adjacent Salinas River channel.

The Salinas Treatment Facility is designed and permitted for an average daily flow of 4.0 million gallons per day (MGD) with a peak flow of 6.8 MGD. The Salinas Treatment Facility operates year-round, with a current monthly inflow during summer months of approximately 3.5 to 4.0 mgd. This summer peak corresponds with the peak agricultural harvesting season in the Salinas Valley. However, substantial flows to the Salinas Treatment Facility have continued during the winter months due to the importation of agricultural products from Arizona for processing. (Schaaf and Wheeler, 2014b).

Salinas River Lagoon

The mouth of the Salinas River is a seasonal lagoon controlled by the presence of a sandbar that forms in response to changes in outflow and tidal cycles (Hagar Environmental Science and MCWRA, 2011). Lagoons form in response to seasonal rainfall and water patterns, and tidal influences, with sandbar closure during dry periods (spring through fall) and breaching during wet periods (primarily in winter). After sandbar formation, water surface elevation rises as the impounded lagoon fills with freshwater stream flow. Sandbars generally breach at the onset of fall and winter storms, converting the estuaries to freshwater during high flows and brackish estuaries during low inflows if there is still a substantial area of impounded water despite removal of all or most of the sandbar. In the Salinas River, flooding of agricultural lands adjacent to the lagoon can precede the natural breaching. As such, the MCWRA manages lagoon water levels as part of its flood control activities (Hagar Environmental Science and MCWRA, 2011).

During the summer months, the Salinas River flows from the Salinas River lagoon into the Old Salinas River Channel through a gated culvert. Direct discharge to the ocean is blocked by a seasonal sand bar which forms across the mouth of the Salinas Lagoon due to wave and tidal action in the Monterey Bay. The Old Salinas River channel is controlled by tide gates at Potrero Road in Moss Landing. River flow combines with Tembladero Slough flow approximately 1.2-miles above the tide gates. During high winter flows in the Salinas River, the sand bar breaches and the river flows directly to the Bay. When this occurs, the MCWRA closes the slide gate to the Old Salinas River. **Figure 4.4-2** in **Section 4.4, Biological Resources: Fisheries**, shows the relationship of the various waterbodies in northern Salinas Valley.

The study area for the Reclamation Ditch and Tembladero Slough diversions consists of downstream reaches of two interconnected waterbodies in Monterey County, California: the Reclamation Ditch and the Tembladero Slough (see **Figure 4.4-1**). The most upstream point of the study area is the Reclamation Ditch near Davis Road near the western border of the City of Salinas. All downstream waterbodies, including the Tembladero Slough and the Old Salinas River Channel to the Potrero Tide Gates are included in the study area for this hydrology and water quality analysis. Within this reach the Reclamation Ditch flows southeast to northwest through agricultural and urban settings, eventually converging with the Tembladero Slough approximately one mile south of the City of Castroville. Downstream of this confluence, the Tembladero Slough flows from east to west and empties into the Old Salinas River Channel at a confluence approximately 1.3 miles upstream of the tide gates on Potrero Road. Land use adjacent to Tembladero Slough is dominated by agriculture.

The Reclamation Ditch receives inflow from several tributaries: Gabilan Creek, Natividad Creek, Alisal Creek, and the Merritt Lake drainage (Casagrande and Watson 2006). The majority of hydrology for the Reclamation Ditch is derived from agricultural and urban runoff.

The Tembladero Slough receives inflow from three waterbodies: the Reclamation Ditch, Santa Rita Creek and Alisal Slough (Casagrande and Watson 2006). The majority of hydrology for the Tembladero Slough is derived from agricultural and urban runoff. The Tembladero Slough drains to the Old Salinas River Channel northwest of Molera Road. Located at this confluence is the Molera Experimental Wetland which uses a pump to divert 0.047 cfs from the Tembladero Slough to circulate through the wetland before and draining back into the Tembladero Slough (Krone-Davis et al., 2013). The Old Salinas River Channel flows from the south to north through agricultural fields and floodplains that abut coastal dunes, eventually connecting with Moss Landing Harbor (Harbor) through the tide gates located at Potrero Road.

The Potrero Road tide gates act as a control structure on the Old Salinas River Channel and the downstream reaches of Tembladero Slough. The tide gates are operated by differences in water surface elevations (WSE): when the Old Salinas River Channel WSE is higher than the Harbor WSE the tide gates open, allowing outflow; when Harbor WSE is higher the gates close. The tide gates limit the inflow of seawater, although some seawater does enter the Old Salinas River Channel (Nicol et al. 2010 as cited in CCoWS, 2015). When the gates are shut they act like a dam, impounding water and building potential energy. When the WSE allows the gates to open, the built up energy is released as the Old Salinas River Channel flows into the Harbor. The interaction between the tides, tide gates, and the Old Salinas River Channel results in a complex system that influences measurements of water quality and streamflow for the Old Salinas River Channel and the lower reaches of the Tembladero Slough.

The Reclamation Ditch, Tembladero Slough, and Old Salinas River Channel are located in the Lower Salinas Valley Watershed (RWQCB-CCR 2010). Casagrande and Watson (2006) identified a collection of sub-watersheds that encompassed the area contributing flow to the Reclamation Ditch, Tembladero Slough and the northern section of the Old Salinas River Channel to the tide gates of Potrero Road. This collection of sub-watersheds is referred to as the Reclamation Ditch Watershed by Casagrande and Watson (2006) and excludes the Salinas River and its connection to the Old Salinas River Channel.

The Reclamation Ditch Watershed as a whole, which includes the Tembladero Slough, the Reclamation Ditch and their contributing water bodies, drains approximately 407 km^2 (157 mi^2). The land cover of the lower Reclamation Ditch Watershed is characterized primarily by agricultural and urban development. The upper watershed, which lies along the eastern slope of the Gabilan Range, is characterized primarily by rangeland grazed by livestock; secondary land cover types include montane riparian vegetation, chaparral, oak woodland, annual grassland and perennial grassland (Casagrande and Watson 2006). Area estimates of land cover types were made using the National Oceanic Atmospheric Association (NOAA) 2010 digital coast land cover classification which were reclassified into broader categories based on hydrologic significance. Dominant land cover within the Reclamation Ditch Watershed includes, approximately 30% cultivated, 20% grassland, 17% forest, 13% shrub, and 13% developed (NOAA, 2010).

The hydrology of the Reclamation Ditch Watershed was characterized by Casagrande and Watson (2006) as being highly episodic, with the typically low streamflow intermittently interrupted by high streamflow events. Sources contributing to the streamflow vary seasonally. Sources include urban runoff, agricultural tile drain water, and permitted discharge in the dry season and stormwater/urban runoff in the wet season (Casagrande and Watson 2006). The upper reaches of the Reclamation Ditch Watershed are dry for most of the year; as the tributaries aggregate into larger ditches near the City of Salinas they are characterized by perennial standing water. The Reclamation Ditch and Tembladero Slough are characterized by perennially flowing water.

A quantitative characterization of the Reclamation Ditch watershed's hydrology follows in the sections below. This analysis was aided by the United States Geological Survey (USGS) stream gage (USGS 11152650) on the Reclamation Ditch at the San Jon Road Bridge. The stream gage is located 3.4 miles northwest and downstream of the City of Salinas, drains approximately 109.4 mi^2 (283.4 km^2) (Schaaf and Wheeler 1999) and has a period of record from October 1st, 1970 to February 4th, 1986 and from June 1st, 2002 to present. From 1986 to 2002 the USGS gaging site was non-operational; however the MCWRA obtained peak streamflow for the Reclamation Ditch during this period.

Lake El Estero

Lake El Estero is a surface water body that collects water from a major watershed within the City of Monterey and it is proposed to be a potential source water for the project. Under historic natural conditions, Lake El Estero was seasonally either a marine estuary or a brackish water lagoon connected by a surface stream to the Monterey Bay. The connection to the bay was changed to pipe culverts in the 1870s when the Southern Pacific Railroad Company constructed the Monterey and Salinas Valley Railroad on a sand ridge, thereby separating the lake from the bay (Gordon, 1996). The lake was further modified over time, including enlarging it and turning it into a fresh water lake. The City of Monterey maintains Lake El Estero as the central feature of the Lake El Estero Municipal Park. The surface area of Lake El Estero is 18.6 acres.

The Lake collects runoff from approximately 3.78 mi^2 of urban, suburban and wooded area. The majority of the watershed area, 2,014 acres, is pervious, and 404 acres are covered with non-pervious surfaces. As discussed in **Section 4.11.2.3**, the lake is fed by four ephemeral streams, including Majors Creek. In addition to surface water flows to the lake, shallow groundwater percolates into Lake El Estero. The lake level is maintained for aesthetics and recreation use, and excess storm flows are pumped to the ocean through two gravity-flow pipelines. There is a gate between the lake and the pipelines in order to control the release of flows to the ocean. See **Figure 4.11-6**.

The land area that drains to the lake has changed over time. Until 1941, a 1,186-acre area to the west of the lake, extending to Huckleberry Hill, drained into Lake Estero through a box culvert under Pearl Street. This portion of the City stormwater system was reconfigured with the addition of a box culvert under Figueroa Street, which now carries the flow into the Monterey Bay, discharging at the Municipal Wharf. In 1968, the current stormwater pump station at the northeast corner of the lake and outfall pipeline were constructed to facilitate better management of water levels in the lake, including providing for adequate storage to prevent flooding during most storms.

Carmel River

Watershed

The Carmel River is 36 miles long, and drains 255 square miles of the Los Padres National Forest and the Ventana Wilderness, as well as range, farm, and urban lands. The headwaters of the Carmel River are in the Santa Lucia Mountains. The larger tributaries of the Carmel River include Garzas Creek, San Clemente Creek, Tularcitos Creek, Pine Creek, Danish Creek, Cachagua Creek, and the Miller Fork. The Carmel River drains into the Pacific Ocean at Carmel River State Beach in Carmel Bay, which is part of the Monterey Bay National Marine Sanctuary and also is designated as an Area of Special Biological Significance (ASBS). The watershed is a highly dynamic system, experiencing large seasonal variability in flow levels and variation in sediment transport from the upper watershed to the estuary and ocean. Water from the Carmel River has been used as a supply for the Monterey Peninsula since 1883 when the first dam on the Carmel River was built. As the demand for water increased, two more dams were subsequently built. The San Clemente Dam was constructed in 1921, with a capacity of 1,300 AF. Los Padres Dam, with 3,200 AF of storage capacity, was completed in 1949. As of 2013, the San Clemente Dam has no storage capacity and is not used for water supply due to siltation. The dam also has been determined to be seismically unsafe by the California Division of Safety of Dams (DSOD). A construction project to remove the San Clemente Dam commenced in 2014 under direction from DSOD. The Los Padres Dam's capacity has diminished because of siltation, and is currently operated for conjunctive use: 1) to enhance stream habitat; and 2) to recharge the aquifer from which Cal-Am pumps. (Carmel River Watershed Conservancy and CSUMB Watershed Institute, 2013)

Carmel River Flows and Hydrology

Stream flow in the Carmel River occurs in direct response to rainfall. Annual rainfall in the upper watershed at San Clemente Dam averages 20.4 inches, with more than 90% of this average occurring between November and April. Typically, the first winter rains replenish soils that have dried out during summer. Consequently, there is little runoff before December. Most of the early rainfall percolates into the ground and recharges the aquifer, thus adding little flow to the lowest reach of the river near the coast. CalAm owns and operates San Clemente and Los Padres dams on the Carmel River. After the reservoirs have filled, usually by mid-December, water overflows into the lower Carmel River. As groundwater levels rise, the period of highest stream flow begins, usually from January through April. Average monthly flows in the lower Carmel River during January through April are between 180 and 380 cfs. Usually, the river dries up in the lower valley by July. From July until the onset of rains, the only water remaining in the lower Carmel River is in isolated pools that gradually dry up as the water table declines in response to pumping. Currently, CalAm's Monterey District service area system relies upon withdrawals from the Carmel River Aquifer through wells located in the lower part of the Carmel Valley and from wells located in the Seaside Groundwater Basin. .

The riverbed and stream banks of the Carmel River are generally composed of non-cohesive silts, sands, and gravels. In the lower 15 miles of the river, this sediment ranges in thickness from 150 feet near the mouth of the river to about 60 feet at a point 15 miles upstream. Beginning in the 1960s, pumping diversions along with gravel mining, agricultural development, residential development, and routine removal of vegetation and gravel bars have affected the Carmel River bank stability. Other activities affecting the river are past floodplain development practices, existing water diversions, trapping of sediment behind the main stem dams, and past gravel extraction practices (Monterey Peninsula Water Management District/Denise Duffy & Associates, 2014).

Monterey Bay

The Monterey Bay is a bay of the Pacific Ocean, along the central coast of California, between the cities of Santa Cruz on the north and Monterey on the south. Designated in 1992, the Monterey Bay National Marine Sanctuary (MBNMS) is a federally protected marine area offshore of California's central coast. The MBNMS is larger than the Monterey Bay itself, as it stretches from Marin County on the north to Cambria in San Luis Obispo County on the south, encompassing a shoreline length of 276 miles and 16,904 mi^2 of ocean, extending an average distance of 30 miles from shore.

The oceanographic feature primarily affecting waters of Monterey Bay and its adjacent continental shelf is the California Current System, which consists of the California Current, the California Undercurrent, and the Davidson Current. The California Current is a large-scale upper ocean current that transports cold, subarctic water with lower salinity from the North Pacific south along the North American coast where it mixes with warm, saltier equatorial water (ESA/PWA, 2014). Beneath this near-surface current and relatively close inshore (within 100 kilometers or 62 miles), is the California Undercurrent that transports warm subtropical water northward. During winter months the California Undercurrent becomes the inshore countercurrent or Davidson current (FlowScience, 2014).

Ocean climate refers to oceanographic conditions, including temperature, salinity, and current, and wave patterns prevailing over a period of time. An understanding of the ocean climate in Monterey Bay is important because the climatic conditions within the Bay affect the upwelling and mixing of the ocean water, which in turn affect the water quality in the Bay. There are three known ocean climate seasons in Monterey Bay. These three individual seasons overlap and the dates upon which they occur can vary from year to year.

1. Upwelling Period (typically February to July), when steady northwesterly/westerly winds cause offshore transport of surface waters, and causing deep, colder, nutrient-rich water to rise to the surface (upwelling);
2. Oceanic or California Current Period (typically August to October), when wind relaxation allows previously upwelled water to sink and be replaced by warm oceanic waters from offshore; and
3. Davidson Current Period (typically November to January), when winter storm conditions cause downwelling in Monterey Bay and lower currents in the nearshore area.

4.11.2.3 Surface Water Quality

This section describes existing water quality characteristics of the surface water bodies that have the potential to be affected by the Proposed Project, including the Salinas River and its lagoon, the Reclamation Ditch, including its downstream receiving water bodies

(Tembladero Slough, Old Salinas River Channel, and the Moss Land Harbor), Lake El Estero, and the Monterey Bay/Pacific Ocean. The water quality of a given stream or water body is controlled by multiple factors, including the chemical and physical nature of streambed material (i.e., erodibility, grain size, rock type) and influences from outside the stream corridor, such as quality of groundwater and upstream runoff that may be entering the stream system. Variations in the mineral content of different rock types within the stream course can affect the type and concentration of dissolved metals within a stream. Material that is more easily eroded or finer-grained presents a greater surface area on which chemical reactions can occur, thus influencing water quality. Very fine-grained sediments contribute to elevated turbidity and temperature in a stream, which in turn affects oxygen levels. The water quality of streams located within urban or agricultural corridors is typically influenced by increases in peak runoff, dissolved hydrocarbons, dissolved fertilizers, pesticide and herbicide residue, and increases in sediment loads. Agricultural runoff commonly contains fertilizers and pesticides, nutrient-response indicators within the waterway (i.e., dissolved oxygen, chlorophyll a and microcystins levels), as well as increased sediment loads in receiving waters. Groundwater quality is addressed in **Section 4.10, Hydrology and Water Quality: Groundwater Resources**.

Salinas River and Reclamation Ditch Watersheds

The Central Coast Regional Water Quality Control Board (RWQCB) has listed numerous water bodies in the Proposed Project hydrology and water quality study area as “impaired” pursuant to Section 303(d) of the Clean Water Act. The RWQCB has established Total Maximum Daily Load (TMDL) requirements for these pollutants that are the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards. Additional detail on the RWQCB’s 303(d) and TMDL programs is provided in the following subsections and in Regulatory Framework Section 4.11.3. The impaired streams, channels or water bodies in the Salinas River and Reclamation Ditch watersheds and the pollutants for which they are listed are shown in **Table 4.11-1.**

Table 4.11-1
List of Impaired Water Bodies in the Salinas Area

Listed for:	Ammonia (Unionized)	Chlordane	Chloride	Chlorophyll-a	Chlorpyrifos	Copper	DDD (Dichlorodiphenyldichloroethane)	Diazinon	Dieldrin	Electrical Conductivity	Enterococcus	Escherichia coli (E. coli)	Fecal Coliform	Low Dissolved Oxygen	Metals	Nickel	Nitrate	Nutrients	Pathogens	PCBs (Polychlorinated biphenyls)	Pesticides	pH	Priority Organics	Sediment Toxicity	Sedimentation/Siltation	Sodium	Temperature, water	Total Coliform	Total Dissolved Solids	Toxaphene	Turbidity	Unknown Toxicity
Water Body																																
Alisal Creek (Monterey County)				X									X				X									X						
Alisal Slough (Monterey County)														X			X							X								X
Blanco Drain					X			X						X			X				X										X	
Espinosa Lake					X			X																								
Espinosa Slough	X							X									X				X	X	X	X							X	X
Gabilan Creek	X												X				X					X		X							X	X
Majors Creek (Monterey County)						X						X																				
Merrit Ditch	X													X			X							X							X	X
Monterey Harbor															X									X								
Moss Landing Harbor					X			X						X		X			X		X	X		X	X							
Natividad Creek	X											X		X			X					X		X			X				X	X
Old Salinas River				X	X			X				X	X	X			X					X		X							X	X
Old Salinas River Estuary																		X			X											
Salinas Reclamation Canal	X				X	X		X				X	X	X			X				X	X	X	X							X	X
Salinas River (lower, estuary to near Gonzales Rd crossing, watersheds 30910 and 30920)		**X**	**X**		**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**				**X**			**X**	**X**	**X**				**X**			**X**	**X**	**X**	**X**
Salinas River Lagoon (North)																		X			X											
Santa Rita Creek (Monterey County)	X											X	X	X			X									X					X	

Source: RWQCB, 2011b.

Salinas River Water Quality

The RWQCB's *Water Quality Control Plan for the Central Coast Basin* (Basin Plan) designates beneficial uses of the Salinas River below Spreckels as including municipal and domestic supply, agricultural supply, non-contact water recreation, wildlife habitat, warm and cold water fish habitat, freshwater replenishment (of the Salinas Lagoon) and commercial or sport fishing.

The Salinas River is listed as an impaired water body pursuant to Section 303(d) of the Clean Water Act for chlorides, pesticides, Escherichia coli, fecal coliform, nitrate, total dissolved solids (TDS), turbidity and other factors. Water quality has been monitored for the past 15 years under various programs, including the Central Coast Ambient Monitoring Program (CCAMP) under the RWQCB, the Central Coast Watershed Studies (CCoWS) program of the Watershed Institute at California State University Monterey Bay, and the Cooperative Monitoring Program under the Conditional Waiver of Waste Discharges from Irrigated Lands (Ag Waiver). The results of these programs are summarized in **Table 4.11-2**. The RWQCB adopted order R3-2013-0008 to establish TMDLs for pollutants in the lower Salinas River Basin in 2013. These and other applicable water quality standards and the TMDLs for the Salinas River are also shown in **Table 4.11-2**, below.

Table 4.11-2
Water Quality Parameters, Salinas River below Spreckels

Parameter	Units	Mean$_1$	Max$_1$	Standard$_{Note\ 2}$
Ammonia as N, Unionized	mg/L	0.02	0.13	0.025
Ammonia as NH3	mg/L	0.12	0.98	0.025 $_{Note\ 3}$
Chlorophyll a, water column	mg/L	0.0033	0.023	0.015
Chlorpyrifos	mg/L	0.0011	0.029	0.00025
Diazinon	mg/L	0.008	0.22	0.00016
Dissolved Solids, Total	mg/L	369.60	610.00	1000 $_{Note\ 3}$
Nitrate as N	mg/L	5.08	78.00	1.4 (May-Oct) 8.0 (Nov-Apr)
OrthoPhosphate as P	mg/L	0.23	2.60	0.07 (May-Oct) 0.3 (Nov-Apr)
Oxygen, Dissolved	mg/L	0.36	2.66	> 7.0
Turbidity	NTU	118.66	2,584.00	10 $_{Note\ 3}$

1. Max and Mean values reflect all results in the CCAMP/CCoWS database
2. Listed TMDL established by RWQCB, except where noted
3. Proposed TMDL from CCAMP program
(Schaaf & Wheeler, 2015a) See **Appendix O**.

The City of Salinas operates the Salinas Treatment Facility under Waste Discharge Requirement Order R3-2003-0008. The City also has a National Pollutant Discharge Elimination System permit (number CA0049981, Order R3-2012-0005) for municipal stormwater discharges. Both of these permits require water quality monitoring and reporting. For the Salinas Treatment Facility, influent and effluent water quality is monitored at the treatment plant. For stormwater, the City monitors stormwater outfalls and receiving streams at various locations. **Table 4.11-3**, below, shows the most recent sampling results for those parameters.

Table 4.11-3
City of Salinas, Water Quality Sampling

Analyte Name	Units	Stormwater at the TP1 Site	Salinas Treatment Facility Effluent[1]	Standard
Ammonia as N, Unionized	mg/L	0.00022	NR	0.025
Chloride	Mg/L	NR	318	150
Dissolved Solids, Total	mg/L	50.8	1011	1000
Nitrate as N	mg/L	ND	0.12	1.4 (May-Oct) 8.0 (Nov-Apr)
OrthoPhosphate as P	mg/L	0.2	NR	0.07 (May-Oct) 0.3 (Nov-Apr)
Oxygen, Dissolved	mg/L	5.54	>4.5	>7
Turbidity	NTU	44.7	NR	10

Stormwater results from 2012-2013 season, Salinas Treatment Facility results from 2013
ND = not detected, NR = testing not required
Note 1: Effluent sampling conducted on flows from ponds to disposal beds
(*Schaaf & Wheeler, 2015a*) See **Appendix O**

The results above are typical of those in previous annual reports. The stormwater runoff is generally of equal or better quality than the Salinas River that receives it. It meets the RWQCB Basin Plan objectives in some categories. In the categories of turbidity and orthophosphate, it exceeds the Basin Plan objectives, but is below the average concentration in the receiving stream. Although the stormwater runoff may slightly improve the quality of the water in the river, the Salinas River basin is so large that diverting urban stormwater runoff to the Proposed Project should have no appreciable effect on water quality within the Salinas River.

Effluent from the Salinas Treatment Facility is not tested for ammonia or orthophosphate, so a general water quality comparison with the Salinas River cannot be made. The effluent exceeds the Basin Plan objective for chloride and TDS. Diverting Industrial Wastewater to the Proposed Project may result in reduced TDS levels in the river, particularly in summer months when percolation from the Salinas Treatment Facility makes up a significant portion of the river flow.

Reclamation Ditch Watershed, including Tembladero Slough

The RWQCB Basin Plan designates beneficial uses of the Reclamation Ditch as including water contact recreation, non-contact water recreation, wildlife habitat, warm water fish habitat and commercial or sport fishing. These are the minimum uses listed for all inland water bodies within the region, unless specific water quality information causes the RWQCB to remove a specific use (e.g., not listing water contact recreation for a stream segment listed for fecal coliform contamination). The Tembladero Slough is designated as having additional beneficial uses of estuarine habitat, rare/threatened/endangered species, and spawning/reproduction/early development habitat. **Table 4.11-4** lists the Basin Plan beneficial uses for all relevant stream segments in the lower Salinas Valley. The abbreviations and their meanings are provided below the table.

Table 4.11-4
Beneficial Use Designations for Surface Water in Project Area

Water Bodies	MUN	AGR	GWR	REC1	REC2	WILD	COLD	WARM	MIGR	SPWN	BIOL	RARE	EST	FRESH	COMM	SHELL
Old Salinas River Estuary				X	X	X	X	X	X	X	X	X	X		X	X
Tembladero Slough				X	X	X		X		X		X	X		X	X
Salinas Reclamation Canal				X	X	X		X							X	
Blanco Drain				X	X	X		X							X	
Salinas River Lagoon (North)				X	X	X	X	X	X	X	X	X	X		X	X
Salinas River (downstream of Spreckels Gage)	X	X			X	X	X	X	X					X	X	
Lake El Estero	X		X	X	X	X	X	X		X					X	

SOURCE: RWQCB, 2011

KEY TO ACRONYMS:

MUN - Municipal and Domestic Water Supply: Uses of water for community, military, or individual water supply systems, including, but not limited to, drinking water supply, subject to the exclusions allowed under the State Water Resources Control Board Sources of Drinking Water Policy.

AGR - Agricultural Supply: Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.

GWR - Ground Water Recharge: Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers. Ground water recharge includes recharge of surface water underflow.

REC-1 - Water Contact Recreation: Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.

REC-2 - Non-Contact Water Recreation: Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

WILD - Wildlife Habitat: Uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (i.e., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

COLD - Cold Fresh Water Habitat: Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

WARM - Warm Fresh Water Habitat: Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

MIGR - Migration of Aquatic Organisms: Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.

SPWN - Spawning, Reproduction, and/or Early Development: Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.

BIOL - Preservation of Biological Habitats of Special Significance: Uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.

RARE - Rare, Threatened, or Endangered Species: Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered.

Table 4.11-4
Beneficial Use Designations for Surface Water in Project Area

EST - Estuarine Habitat: Uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (i.e., estuarine mammals, waterfowl, shorebirds). An estuary is generally described as a semi-enclosed body of water having a free connection with the open sea, at least part of the year and within which the seawater is diluted at least seasonally with fresh water drained from the land. Included are water bodies which would naturally fit the definition if not controlled by tidegates or other such devices.
FRSH - Freshwater Replenishment: Uses of water for natural or artificial maintenance of surface water quantity or quality (i.e., salinity) which includes a water body that supplies water to a different type of water body, such as, streams that supply reservoirs and lakes, or estuaries; or reservoirs and lakes that supply streams. This includes only immediate upstream water bodies and not their tributaries.
COMM - Commercial and Sport Fishing: Uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.
SHELL - Shellfish Harvesting: Uses of water that support habitats suitable for the collection of filter- feeding shellfish (i.e., clams, oysters, and mussels) for human consumption, commercial, or sport purposes. This includes waters that have in the past, future, contain significant shellfisheries.

RWQCB Order No. R3-2012-0011 (Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands) found that:

> "...*toxicity resulting from agricultural discharges of pesticides has severely impacted aquatic life in Central Coast streams...Twenty-two sites in the region, 13 of which are located in the lower Salinas/Tembladero watershed area, and the remainder in the lower Santa Maria area, have been toxic in 95% (215) of the 227 samples evaluated*."

The Reclamation Ditch (Salinas Reclamation Canal) and Tembladero Slough are listed as impaired water bodies pursuant to Section 303(d) of the Clean Water Act for ammonia, fecal coliform, pesticides, nitrate, toxicity and other parameters. Water quality has been sampled and monitored for the past 15 years under various programs. The following discusses these programs in more detail.

Summary of Reclamation Ditch Watershed Monitoring

Water quality in the Reclamation Ditch watershed has been monitored and assessed by several local agencies and institutions. The water quality data summarized in this section include monitoring conducted by the RWQCB, Cooperative Monitoring Program under the Conditional Waiver of Waste Discharges from Irrigated Lands (Ag Waiver). Monterey Bay Sanctuary Citizen Watershed Monitoring Network, CCoWS, City of Salinas, University of California Santa Cruz (UCSC), and CSUMB.

The RWQCB's Central Coast Ambient Monitoring Program (CCAMP) collects water quality data to protect and enhance water bodies by informing regulatory decision making. Specifically, for the Salinas Valley area the goal of the program was to quantify the pollutant load at several sites to support the development of TMDL assessments (Worcester et al. 2000). CCAMP has established four sampling sites within the Reclamation Ditch Watershed study area, three sites in or near the Reclamation Ditch and one site in Tembladero Slough: Reclamation Ditch at Airport Road (called the Salinas Reclamation Canal at Airport Road), a storm drain on the Reclamation Ditch (called the Salinas Reclamation Canal Drain at Airport Road), on the Reclamation Ditch at Boronda Road (called the Salinas Reclamation Canal at Boronda Road), and Tembladero Slough at Preston Road. The program has collected monthly water quality data every five years since 1999. The CCAMP data compiled and reported by Worcester et al. (2000) found that in the Reclamation Ditch dissolved oxygen levels were low, especially in the summer months, and levels of nitrate, ammonia, orthophosphate, chloride, bacteria, heavy metals and pesticides were elevated.

Water quality data from various projects and monitoring efforts are available for download from the California Environmental Data Exchange Network (CEDEN) (2014) website, including: water chemistry, sediment chemistry, water toxicity, sediment toxicity, benthic macro invertebrate, physical habitat, bioaccumulation, tissue chemistry, and marine benthic invertebrate assemblages. Data from CEDEN (2014) included measured TDS from forty grab samples that had been collected from the Molera Road site on Tembladero Slough. Measured values for TDS at Molera Road varied from 470 mg/L to 9700 mg/L.

The CCoWS group at CSUMB has conducted extensive monitoring of the Reclamation Ditch Watershed. In 2000 Watson et al. (2003) collected suspended sediment, bedload and nutrient samples at three sites within the Reclamation Ditch (San Jon, Victor Way, Hwy 183) and at Molera Road on Tembladero Slough. They found that the Reclamation Ditch Watershed had high sediment loads and sedimentation.

The Monterey Bay Sanctuary Citizen Watershed Monitoring Network has measured water quality in Tembladero Slough and the Reclamation Ditch on the second Saturday in May every year since 2006. They measured the following water quality parameters: fecal coliform bacteria, nitrate, phosphate, DO, pH, water temperature and transparency (MBNMS 2013).

In 2006, a CSUMB student analyzed the streamflow and water quality of the Tembladero Slough at Haro Street during the winter of 2005-06 for his senior capstone thesis (Frank 2006). Frank installed a pressure transducer and measured streamflow using a current meter attached to a crane from the Haro Street bridge (2006). To account for the tidal influence Frank (2006) used a 24-hour moving window to successfully delineate the streamflow from tidal influence. Frank (2006) suggested that the influence of the tides and the tide gates on streamflow at Haro Street was also dependent on the volume of discharge. During periods of low flow the tide gates remain closed, reducing the direct influence of the tides. Conversely, during periods of higher flow the tide gates remain open longer leading to a greater direct influence of the tides on Tembladero Slough at Haro Street.

In 2006, Casagrande and Watson conducted a watershed assessment for the Reclamation Ditch Watershed. They summarized water quality measurements for ten sites within Tembladero Slough and the Reclamation Ditch using data from CCAMP, the City of Salinas, CcoWS, and UCSC. This study analyzed and synthesized a number of water quality parameters, including among others, temperature, DO, salinity, pH, TDS, and turbidity. Casagrande and Watson (2006) warn that the water quality data should be used as synoptic indicators, since each study summarized had different sampling design and sampling times. Casagrande and Watson (2006) reported the ranges of salinity as 1.03 – 25.95 parts per trillion (ppt, which is equivalent to mg/L), 0.6 – 0.88 ppt, and 0.7 – 0.8 ppt for Molera Road, San Jon Road, and Boronda Road respectively; and reported the range of TDS as 2105 – 2190 mg/L, 4.22 – 1231 mg/L, 128 – 745 mg/L for Molera Road, San Jon Road, and Boronda Road respectively.

In 2010, the CSUMB ENVS 660 class assessed spatial and vertical patterns in salinity within the Old Salinas River Channel and the lower Tembladero Slough during the month of November (Nicol et al. 2010). The reach of interest for the study extended from the tide gates at Potrero Road upstream into the Tembladero Slough, just past Molera Road Within this reach they took salinity depth profiles every 200 meters to determine the longitudinal salinity profile. Vertical salinity profiles were conducted by taking salinity readings at specific depth increments, from the water surface to the bottom of the channel. During the 2010 study, discharge in the Reclamation

Ditch ranged from 0.7 to 3.0 cfs at the San Jon USGS gage during sampling events, except on November 21, 2010 when discharge in the Reclamation Ditch was at approximately 30 cfs. Nicol et al. (2010) observed that salinity generally decreased with increased distance from the tide gates. They noted that within their reach of interest salinity and water depth typically increased with rising tides. They observed that during low tides, when the tide gates opened, salinity in the water column was generally more homogenous. However, not all low tides receded enough to allow the tide gates to open or fully open. Nicol et al. (2010) also observed that WSE changed overtime as a result of the change in pressure on the tide gates. Salinity depth profiles taken at Molera Road during the course of the 2010 study showed a typically uniform column with salinity values ranging from zero to five ppt. A halocline was observed at Molera on November 18; during this time salinity was approximately 20 ppt at the bottom of the channel. This observation followed a neap tide which occurred on December 16. Nicol et al. (2010) concluded that spatial and temporal variations of salinity, due in part to the timing and magnitude of the tides existed in the reach of interest.

In 2014, a CCoWS Advanced Watershed Science and Policy class (ENV 660) explored spatial and temporal dynamics of the Reclamation Ditch and Tembladero Slough systems, by measuring several water quality parameters and streamflow at three sites on the Tembladero Slough and three sites on the Reclamation Ditch over five nonconsecutive days between November 11th and December 2nd, 2014. The maximum salinity recorded was 19.2 ppt at the Molera Road site in the Tembladero Slough at the deepest point within the water column. For the remaining two sites on the Tembladero Slough, salinity did not exceed 1.5 ppt throughout the study period. Salinity for all three sites within the Reclamation Ditch was below 0.5 ppt.

The study found streamflow and salinity results at the Molera Road site were influenced by several factors, including the tides. The students observed an increase in stage and a decrease in streamflow at this site during high tide. They also observed a difference in streamflow between Haro Street and Molera Road during low tide.

Drought may have influenced the measurements. When the study began, California was entering its third year of drought. Besides obvious reductions in streamflow, drought can also result in a reduction of dissolved oxygen and changes in other water quality parameters. Conversely, two precipitation events, occurring on November 13th and December 2nd, influenced the results as increases in streamflow coincided with these events. Streamflow and salinity were also impacted by other water inputs into these waterbodies, such as urban and agricultural runoff.

Each dataset described above is limited in terms of comparison and identifying general trends since each project may have a unique sampling design and different period of study.

Summary of Applicable Water Quality Standards and Data for the Reclamation Ditch and Tembladero Slough

The Central Coast RWQCB adopted Resolution No. R3-2013-0008 to adopt TMDLs and implementation plans for nitrogen compounds and orthophosphate in the Lower Salinas River, Reclamation Canal Basin and Moro Cojo Slough Watershed. The also adopted Resolution No. R3-2010-0017, which established TMDLs for Fecal Coliform. The resulting standards from the TMDL along with existing applicable and proposed water quality standards are consolidated in **Table 4.11-5, Total Maximum Daily Loads**.

Table 4.11-5
Total Maximum Daily Loads

Analyte Name	Units	Standard	Reference
Ammonia as N, Unionized	mg/L	0.025	Board Order R3-2013-0008
Ammonia as NH3	mg/L	0.025	CCAMP Proposed
Chloride	mg/L	150	Basin Plan
Chlorophyll a, water column	mg/L	0.015	Board Order R3-2013-0008
Chlorpyrifos	mg/L	CMC 0.00025 CCC 0.00015	Board Decision 2011
Coliform, Fecal	MPN/100 ml	200	Board Order R3-2010-0017
Coliform, Total	MPN/100 ml	10,000	US EPA
Diazinon	mg/L	CMC 0.00016 CCC 0.00010	CC RWQCB Decision 2011
Dissolved Solids, Total	mg/L	1000	CCAMP Proposed
Nitrate as N (all streams with MUN use)	mg/L	10	Board Order R3-2013-0008
Nitrate as N (Salinas River)	mg/L	1.4 (dry season) 8.0 (wet season)	Board Order R3-2013-0008
Nitrate as N (Rec. Ditch, Tembladero, Blanco Drain, Alisal Slough, Espinosa Slough, Merritt Ditch, Santa Rita Creek)	mg/L	6.4 (dry season) 8.0 (wet season)	Board Order R3-2013-0008
Nitrate as N (OSR)	mg/L	3.1 (dry season) 8.0 (wet season)	Board Order R3-2013-0008
OrthoPhosphate as P (Salinas River)	mg/L	0.07 (dry season) 0.30 (wet season)	Board Order R3-2013-0008
Orthophosphate as P (Rec. Ditch, Tembladero, Blanco Drain, Alisal Slough, Espinosa Slough, Merritt Ditch, Santa Rita Creek)	mg/L	0.13 (dry season) 0.30 (wet season)	Board Order R3-2013-0008
Oxygen, Dissolved	mg/L	>7.0 and <13.0 (Cold) >5.0 and <13.0 (Warm)	Board Order R3-2013-0008
Suspended Solids, Total	mg/L	500	CCAMP Proposed
Turbidity	NTU	10	CCAMP Proposed

CMC = Criterion Maximum Concentration (1-hr average) CCC = Criterion Continuous Concentration (96-hour average) MPN/100 ml = Minimum Probable Number per 100 milliliters NTU = Nephelometric Turbidity Unit; Order R3-2013-0008: Lower Salinas River Watershed Nutrient TMDL; Seasonal targets for nitrate and orthophosphate (*Schaaf & Wheeler, 2015b)* See **Appendix P**

A summary of the water quality data from the sources described in the previous section for the Reclamation Ditch is provided in **Table 4.11-6** and for Tembladero Slough in **Table 4.11-7.**

Table 4.11-6
Water Quality Parameters, Reclamation Ditch below Carr Lake

Parameter	Units	Mean	Max	Standard
Ammonia as N, Unionized	mg/L	0.029	0.25	0.025
Ammonia as NH3	mg/L	0.61	6.00	0.025
Chloride	mg/L	106.41	200.00	150
Chlorophyll a, water column	mg/L	0.016	0.15	0.015
Chlorpyrifos	mg/L	0.0016	0.055	0.00025
Coliform, Fecal	MPN/100 ml	17,954	160,001	400
Coliform, Total	MPN/100 ml	53,966	160,001	1000
Diazinon	mg/L	0.10	3.16	0.00016
Dissolved Solids, Total	mg/L	641.83	1,080.00	1000
Nitrate as N	mg/L	13.00	69.10	8.0
OrthoPhosphate as P	mg/L	0.65	12.90	0.30
Oxygen, Dissolved	mg/L	0.93	6.58	> 5.0
Suspended Solids, Total	mg/L	69.46	385.00	500
Turbidity	NTU	141.51	1,454.00	10
Note: This table summarizes results from **Table B-12** in **Appendix P**. **Figure A-9** in **Appendix P** shows the primary sampling locations. (Schaaf & Wheeler, 2015b)				

Table 4.11-7
Water Quality Parameters, Tembladero Slough

Parameter	Units	Mean	Max	Standard
Ammonia as N, Unionized	mg/L	0.010	0.074	0.025
Ammonia as NH3	mg/L	0.030	0.060	0.025
Chloride	mg/L	876.41	9,600.00	150
Chlorophyll a, water column	mg/L	0.037	0.66	0.015
Chlorpyrifos	mg/L	0.011	0.070	0.00025
Coliform, Fecal	MPN/100 ml	2,310	54,000	400
Coliform, Total	MPN/100 ml	29,307	240,001	1000
Diazinon	mg/L	0.20	0.52	0.00016
Dissolved Solids, Total	mg/L	2,024.71	18,000.00	1000
Nitrate as N	mg/L	28.59	107.00	8.0
OrthoPhosphate as P	mg/L	0.43	1.20	0.30
Oxygen, Dissolved	mg/L	0.60	8.98	> 5.0
Suspended Solids, Total	mg/L	133.85	1,600.00	500
Turbidity	NTU	211.18	2,663.00	10
Note: This table summarizes results from **Table B-12** in **Appendix P**. **Figure A-9** in **Appendix P** shows the primary sampling locations. (Schaaf & Wheeler, 2015b)				

Blanco Drain

The RWQCB Basin Plan designates beneficial uses of the Blanco Drain as including water contact recreation, non-contact water recreation, wildlife habitat, warm water fish habitat and commercial or sport fishing. These are the minimum uses listed for all inland water bodies within the region, unless specific water quality information causes the RWQCB to remove a specific use (e.g., not listing water contact recreation for a stream segment listed for fecal coliform contamination).

The Blanco Drain is listed as an impaired water body pursuant to Section 303(d) of the Clean Water Act for pesticides, nitrate and low dissolved oxygen. Water quality has been sampled and monitored for the past 15 years under various programs, including the CCAMP under the RWQCB, the CCoWS program of the Watershed Institute at California State University Monterey Bay, and the Cooperative Monitoring Program under the Conditional Waiver of Waste Discharges from Irrigated Lands (Ag Waiver). The Central Coast RWQCB adopted order R3-2013-0008 to establish certain TMDLs for the lower Salinas River Basin in 2013. A summary of the key parameters for the Blanco Drain are shown in **Table 4.11-8**, below.

Table 4.11-8
Water Quality Parameters, Blanco Drain above Salinas River

Parameter	Units	Mean	Max	Standard
Ammonia as N, Unionized	mg/L	0.014	0.26	0.025
Ammonia as NH3	mg/L	0.20	4.96	0.025
Chlorophyll a, water column	mg/L	0.0021	0.028	0.015
Chlorpyrifos	mg/L	0.0009	0.018	0.00025
Diazinon	mg/L	0.01	0.17	0.00016
Dissolved Solids, Total	mg/L	2,019	2,250	1,000
Nitrate as N	mg/L	65.27	325.00	8.0
OrthoPhosphate as P	mg/L	0.85	4.40	0.3
Oxygen, Dissolved	mg/L	0.20	2.52	> 5.0
Turbidity	NTU	66.48	1,210.00	10

Note: This table summarizes the water quality analysis provided in detail in Table B-6 within Appendix Q.
Source: Schaaf & Wheeler, 2015b

Lake El Estero

The RWQCB Basin Plan designates beneficial uses of Lake El Estero as including municipal and domestic supply, groundwater recharge, water contact recreation, non-contact water recreation, wildlife habitat, cold water fish habitat, warm water fish habitat, spawning/reproduction/early development habitat and commercial or sport fishing. Many of these are the minimum uses listed for all inland water bodies within the region, unless specific water quality information caused the RWQCB to remove a specific use (e.g., not listing water contact recreation for a stream segment listed for fecal coliform contamination). The Monterey Harbor has designated beneficial uses of water contact recreation, non-contact water recreation, industrial service supply, navigation, marine habitat, shellfish harvesting, commercial or sport fishing and rare/threatened/endangered species habitat.

Lake El Estero is not listed as an impaired water body, but Majors Creek (a tributary stream to Lake El Estero) and the Monterey Harbor are listed. Majors Creek is listed for copper, lead, zinc and Escherichia coliform. The Monterey Harbor is listed for metals and sediment toxicity. Lake

El Estero serves as a settling basin for stormwater, which is a treatment process for some pollutants in stormwater that would otherwise flow to the Bay. Water passing through the lake carries lower levels of suspended solids than stormwater discharging directly to the Bay.

Water quality has been sampled and monitored for the past 15 years under various programs, including the Central Coast Long-term Environmental Assessment Network (CCLEAN), the Monterey Bay Sanctuary Citizen Watershed Monitoring Network and the City of Monterey Urban Watch. The results of these programs have been consolidated in **Table 4.11-9** for Lake El Estero, Majors Creek, Monterey Harbor and Monterey Bay South Coastline.

The Monterey Regional Storm Water Management Program identifies water quality objectives for stormwater discharging into the Monterey Bay. These and other applicable water quality standards are consolidated in **Table 4.11-10**. See **Appendix R**.

Carmel River Watershed

The Monterey Peninsula Water Management District (Water Management District) has monitored surface-water quality in the Carmel River since 1991. This monitoring is used to help assess whether or not water-quality criteria for aquatic life are being met in various reaches of the Carmel River, and whether habitats for resources such as South-Central Coast steelhead (*Oncorhynchus mykiss*) and California red-legged frogs (*Rana aurora draytonii*) are being sustained or impaired in the Carmel River. Data is used for recommending appropriate reservoir release schedules, determining timing of fish rescues and as an indicator of habitat quality. River temperatures are also continuously monitored at six locations within the Carmel River with the objective to document the temperature regime in different stream reaches and to determine whether water-quality criteria for maximum stream temperatures are exceeded and to monitor changes in the thermal regime of the river over time.

In general, dissolved oxygen (DO), carbon dioxide (CO_2,) and hydrogen potential (pH) levels in the main stem of the Carmel River have met Central Coast Basin Plan objectives. However, average daily water temperature during the late summer and fall commonly exceeds the range for optimum steelhead growth (50-60°F). Water temperature during these months remains in a range that is stressful to this species and can reach levels that threaten aquatic life (above 70°F).

Turbidity in the main stem of the Carmel River is normally low, except during winter when storm runoff events can elevate turbidity for several days during and after a storm event. Very wet years can cause extensive landslides and bank erosion, which can increase turbidity in the main stem for up to several months.

A sand bar closes the mouth of the river off from the ocean most of the year and creates a lagoon. Water quality in the Carmel River Lagoon typically declines during late summer and fall as freshwater inflows cease and ocean waves start to overtop the sandbar at the mouth of the river. Water temperature often exceeds 70°F, which is above Central Coast Basin Plan guidelines. DO levels also periodically drop below guidelines (not less than 7.0 mg/L), probably due to a combination of increasing water temperature and decomposition of marine organic material washed into the lagoon by high ocean waves (Carmel River Watershed Conservancy, 2004).

Table 4.11-9
Water Quality: Lake El Estero, Majors Creek, Monterey Harbor, Monterey Bay South Coastline

Stream	Location	Analyte Name	No. Samples	Units	Mean	Min	Max
Lake El Estero	2 samples, 7/6/2009	Bicarbonate Alkalinity (HCO3)	2	mg/L	284.25	283.0000	285.50
Lake El Estero	2 samples, 7/6/2009	Boron	2	mg/L	0.24	0.23	0.25
Lake El Estero	2 samples, 7/6/2009	Calicium	2	mg/L	108.5	108.0	109.0
Lake El Estero	2 samples, 7/6/2009	Nitrate as N	2	mg/L	ND	ND	ND
Lake El Estero	2 samples, 7/6/2009	E. Coli	2	#/100 ml	48	10	86
Lake El Estero	2 samples, 7/6/2009	Coliform, Total	2	#/100 ml	6,499	6,131	6,867
Lake El Estero	2 samples, 7/6/2009	Enterococcus	2	#/100 ml	31	31	31
Lake El Estero	2 samples, 7/6/2009	Sulfate	2	mg/L	158.0	156.0	160.0
Lake El Estero	2 samples, 7/6/2009	Dissolved Solids, Total	2	mg/L	1,028.0	1,024.0	1,032.0
Lake El Estero	2 samples, 7/6/2009	Total Suspended Solids	2	mg/L	20.5	18.0	23.0
Lake El Estero	2 samples, 7/6/2009	Chloride	2	mg/L	320.5	317.0	324.0
Lake El Estero	2 samples, 7/6/2009	Potassium	2	mg/L	5.6	5.5	5.6
Lake El Estero	2 samples, 7/6/2009	Magnesium	2	mg/L	36.0	36.0	36.0
Twin 51" Outfalls	below El Estero	Nitrate	14	mg/L	0.62	0.16	1.30
Twin 51" Outfalls	below El Estero	Phosporus	15	mg/L	0.40	0.00	0.97
Twin 51" Outfalls	below El Estero	Urea	16	ug/L	317.86	16.00	920.00
Twin 51" Outfalls	below El Estero	E. Coli	17	MPN/100 mL	61,240	50	229,170
Twin 51" Outfalls	below El Estero	Enteroccoccus	18	MPN/100 mL	54,199	125	227,516
Twin 51" Outfalls	below El Estero	Zinc	19	ug/L	142.0	20.0	385.0
Twin 51" Outfalls	below El Estero	Copper	20	ug/L	36.54	5.00	99.00
Twin 51" Outfalls	below El Estero	Lead	21	ug/L	9.85	0.00	44.00
Twin 51" Outfalls	below El Estero	Total Suspended Solids	22	mg/L	40.07	0.00	183.00
Majors Creek	above El Estero	Calcium	5	mg/L	20.22	15.40	26.00
Majors Creek	above El Estero	Coliform, Total	18	MPN/100 ml	104,651	2,400	240,000
Majors Creek	above El Estero	Copper	15	ug/L	65.2	0.0	150.0
Majors Creek	above El Estero	Escherichia coli	18	MPN/100 ml	1,993	17	24,000
Majors Creek	above El Estero	Lead	15	ug/L	19.50	0.00	87.00
Majors Creek	above El Estero	Magnesium	6	mg/L	10.10	5.20	29.00
Majors Creek	above El Estero	Nitrate as N	19	mg/L	0.87	0.00	2.25
Majors Creek	above El Estero	Oil and Grease	1	mg/L	0.00	0.00	0.00
Majors Creek	above El Estero	Orthophosphate as P	19	mg/L	0.37	0.00	1.68
Majors Creek	above El Estero	Oxygen, Dissolved	5	mg/L	8.20	8.00	9.00
Majors Creek	above El Estero	Total Dissolved Solids	15	mg/L	399.73	149.00	930.00
Majors Creek	above El Estero	Total Suspended Solids	15	mg/L	101.13	12.40	531.00
Majors Creek	above El Estero	Zinc	15	ug/L	337.40	0.00	750.00
Monterey Bay	South Coastline	Ammonia as N	11	mg/L	0.023636	0.02	0.04000
Monterey Bay	South Coastline	Chlordanes	3	ng/L	0.01	0.01	0.01
Monterey Bay	South Coastline	ColiformFecal	13	MPN/100 ml	2	2	2
Monterey Bay	South Coastline	ColiformTotal	12	MPN/100 ml	60	2	659
Monterey Bay	South Coastline	Enterococcus	12	MPN/100 ml	2	2	2
Monterey Bay	South Coastline	Nitrate as N	12	mg/L	0.04	0.01	0.16
Monterey Bay	South Coastline	Orthophosphate as P	12	mg/L	0.02	0.01	0.04
Monterey Bay	South Coastline	Silica	12	mg/L	0.51	0.17	1.20
Monterey Bay	South Coastline	Total Suspended Solids	12	mg/L	13.35	6.70	34.40
Monterey Bay	South Coastline	Urea as N	12	ug/L	0.01	0.01	0.01
Highlighted cells exceed objective / standards. See table B13							
Min value of 0.00 = Not Detected.							

Key: E. Coli = Escherichia coli; N = nitrogen ug/L = microgram per liter

Table 4.11-10
Water Quality Objectives applicable to the Lake El Estero Diversion

Analyte Name	Units	Standard	Reference
Nitrate as N	mg/L	2.25	CCAMP Proposed
Orthophosphate as P	mg/L	0.12	CCAMP Proposed
E. coli	MPN/100 ml	400	EPA Ambient Water Quality Criteria
Enterococcus	MPN/100 ml	104	EPA Ambient Water Quality Criteria
Zinc	ug/L	200	Basin Plan Objective
Copper	ug/L	30	Basin Plan Objective
Lead	ug/L	30	Basin Plan Objective
Total Suspended Solids (TSS)	mg/L	500	Basin Plan Objective

Monterey Bay

The seawater in Monterey Bay is a mixture of water masses from different parts of the Pacific Ocean with warmer, saltier water from the equatorial zone and colder, fresher water from the arctic regions. The water quality is a function of different constituents present in the water and the ocean climate in the Bay that affects the concentration of the constituents. This section describes the constituents that are currently regulated or monitored, and that are anticipated to be regulated in the future, by the State Water Resources Control Board (State Board) and the RWQCB (**Section 4.11.3, Regulatory Framework**, provides additional information regarding water quality regulations).

Salinity and Temperature

Near-shore surface temperatures vary from 8°C (46.4°F) during winter and early spring to 17°C (62.6°F) during fall. Near-shore surface salinities vary from 33.2 practical salinity units (psu) to 34.0 psu when upwelling is strong. Practical salinity units are used to measure salinity in terms of the concentrations of dissolved salts in the water. Streams and rivers can affect salinity levels, but even during flood conditions, the salinity of Monterey Bay surface waters does not fall below 31 psu (MBNMS, 2013b).

Dissolved Oxygen

Monterey Bay is a dynamic environment that includes variable concentrations of dissolved oxygen (DO). Ambient DO levels in the Bay at a depth of approximately 100 feet have ranged from 4.25 milligrams per liter (mg/L) to 8.00 mg/L (KLI, 1998; KLI, 1999). Low concentrations of DO can have a detrimental effect on aquatic species. The Water Quality Control Plan for Ocean Waters of California (or Ocean Plan, discussed below in **Section 4.13.3.1**) sets the water quality objective for DO at 5 mg/L.

Other Constituents

The waters of Monterey Bay contain numerous legacy pesticides such as organochlorine pesticides, Dieldrin and DDT, and chemical products in current use such as organophosphate pesticides, polynuclear aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). The largest source of contaminants is agricultural runoff into the San Lorenzo, Pajaro, and

Salinas. Seasonal data collected by CCLEAN[1] between 2001 and 2013 indicate numerous instances where water quality criteria and human health alert levels in Monterey Bay were exceeded due to presence of contaminants (Central Coast Long-term Environmental Assessment Network, 2014). Near-shore waters of Monterey Bay exceeded the Ocean Plan water quality objectives for PCBs. Annual data collected from 2004 to 2013 indicate that waters of Monterey Bay exceeded the Ocean Plan 30-day average PCB water quality objective of 1.9 x10-5 micrograms per liter (µg/L) for most of the years between 2004 and 2012. It is challenging to measure very low levels of PCBs and chlorinated pesticides in natural waters. The data may be biased by sample collection and handling (Luthy 2015).

Monterey Bay also receives point source discharges. These permitted discharges are subject to prohibitions and water quality requirements by regulatory agencies (i.e., the RWQCB and U.S. Environmental Protection Agency) such as periodic monitoring, annual reporting, and other requirements designed to protect the overall water quality of Monterey Bay. In the vicinity of the MRWPCA outfall, some of these permitted discharges include stormwater discharges from the cities of Marina, Sand City, Seaside, Monterey, Del Rey Oaks, and Pacific Grove, and unincorporated portions of Monterey County, and treated wastewater from the MRWPCA Regional Treatment Plant. Another permitted point discharge in Monterey Bay is located 7 miles north of the project area in Moss Landing and is a natural gas power plant operated by Dynegy whose cooling water is discharged.

Ocean Climate

Ocean climate refers to oceanographic conditions, including temperature, salinity, and current, and wave patterns prevailing over a period of time. Climatic conditions within the Bay affect the upwelling and mixing of the ocean water, which in turn affect the water quality in the Bay. As discussed above in **Section 4.13.2.2**, there are three known ocean climate seasons in Monterey Bay: (1) a wind-induced upwelling period producing cooler surface water between mid-February and November; (2) an oceanic period of warmer water, when winds relax and upwelling ceases, between mid-August to mid-October; and (3) the "low thermal gradient phase" or the Davidson current period between December and mid-February. These three individual seasons overlap and the dates upon which they occur can vary from year to year. For further information on ocean climate seasons see **Appendix T** (FlowScience, 2014a).

Besides the ocean climate seasons, the mixing of the ocean water is influenced by the ocean water density, physical processes such as waves and currents, and physical features on the ocean floor. The salinity and temperature of the ambient water determines its density, which in turn affects the extent of the mixing. The mixing process is enhanced by turbulence induced by currents and waves. Current velocities can be different throughout the water column. Tidally-driven currents can cause large pulses of water movement. Wave action, particularly during stormy periods, can vertically stir the water and cause enhanced dilution. The ocean water density and the physical processes (waves and currents) vary as a result of seasonal weather cycles and can also be severely modified by global ocean climate events, such as the Pacific Decadal Oscillation, a long-lived El Niño-like pattern of Pacific climate variability (State Water Resources Control Board, 2012).

[1] CCLEAN is a long-term water quality monitoring program designed to help municipal agencies and resource managers protect the quality of the near-shore marine waters in the Monterey Bay. CCLEAN is a collaborative program between the cities of Watsonville and Santa Cruz, MRWPCA, Carmel Area Wastewater District, Dynegy Moss Landing Power Plant, and Central Coast Regional Water Quality Control Board (CCLEAN, 2013).

The third factor, physical features, refers to regional bathymetry and localized effects from structures such as pipelines and outfall structures. The bathymetry in the vicinity of the MRWPCA outfall structure is relatively flat with an average slope of 1% to the west of the diffuser for 5 miles. The rim of Monterey Submarine Canyon is less than 4 miles to the northwest of the project area. The Monterey Submarine Canyon measures 292 miles long, approximately 7 miles wide at its widest point and is the deepest and largest submarine canyon on the coast of North America (larger than the Grand Canyon).

4.11.2.4 Floods, Seiche, and Ocean-Related Inundation

Flooding

The Federal Emergency Management Agency (FEMA) has designated areas in Monterey County that have a 1% chance of flooding in any given year (100-year flood) and areas that have a 0.2% chance of flooding in any given year (500-year flood). The areas along the coast designated with a 1% chance of flooding include areas subject to coincident flooding and high tide event/and or storm surge. The MCWRA is responsible for issuing permits for construction within designated flood zones in the project area. Floodplain regulations in the county extend to areas within 200 feet of rivers or within 50 feet of watercourses (MCWRA, 2008). Local cities in the county are responsible for permitting development within their floodplains.

Historically, significant flooding events have occurred in Monterey County. Three of the largest events in the last 15 years include January 1995, March 1995, and February 1998 (MCWRA, 2008). During these events, major water bodies, including the Salinas River and Carmel River, experienced flooding and Monterey County was declared a federal disaster area. Additional areas of the County could flood due to dam failure, tsunamis, or sea level rise (see the following sections for further information on these types of inundation risks). Dams located within the project vicinity include Los Padres and San Clemente Dams in the Carmel Watershed, and Nacimiento and San Antonio Dams in the Salinas Watershed.

Review of Monterey County and FEMA flood maps found that some of the Proposed Project components would be located within a 100-year flood hazard area (**Figure 4.11-7**). The Source Water Diversion and Storage sites within the Salinas Valley would be located in the 100-year flood hazard area associated with the Salinas River and Reclamation Ditch watersheds. Some small portions of the proposed Product Water Conveyance pipelines (both the Coastal and RUWAP alignments) would cross through small localized flood areas. In the City of Monterey near Del Monte Beach, the Lake El Estero Diversion site and the CalAm Distribution System: Monterey Pipeline would be located within a 100-year flood hazard area. The Treatment Facilities at the Regional Treatment Plant and the Injection Well Facilities would not be located within a 100-year flood hazard area.

Tsunami/Seiche

Seismic shaking during earthquakes can result in the formation of waves within open bodies of water. The two major types of seismically generated wave are tsunamis and seiches. Tsunamis are waves generated by the displacement of a large volume of water and, therefore, only occur in large water bodies such as oceans, bays, or large lakes. Displacements of water can occur by several mechanisms (including subaqueous landsliding or explosions) but are most commonly caused by the submarine displacements of the earth's crust resulting from earthquakes. A seiche is a wave that oscillates in lakes, bays, or gulfs from a few minutes to a few hours as a result of seismic or atmospheric disturbances. Small seiches are almost always present on larger lakes, and the frequency of the oscillation is determined by the size of the water body, its depth and contours, and the water temperature. Larger seiches can be caused by nearby or distant earthquakes and occur when the wave signature of the seismic waves is resonant with the natural period (controlled by basin geometry) of the lake.

Given the size of Monterey Bay and the area connected to the open Pacific Ocean, formation of seiches in the bay is unlikely. However, the formation of a tsunami in the bay is likely and a tsunami surge entered the bay as recently as February 2011, caused by a large earthquake in Japan. California Emergency Management Agency and the USGS modeled the tsunami hazards for the coast of Monterey Bay and found that the coastline of the bay at the mouth of the Carmel and Salinas Rivers and portions of the tidal influence zone of the rivers could be inundated in a tsunami. The mapped tsunami inundation area for the Salinas River includes the beach areas along and the lower portion of the Salinas River floodplain from the river mouth to approximately five miles from the coast. See **Figure 4.11-8**. The modeling considered local tsunami sources (including offshore reverse-thrust faults, restraining bends on strike-slip fault zones and large submarine landslides) and distant tsunami sources around the Pacific Basin that are known to have generated historic tsunamis. (California Emergency Management Agency, 2009)

A majority of the coastline along Monterey Bay is mapped within a tsunami inundation area, and some project components such as portions of the proposed CalAm Distribution System: Monterey Pipeline would be located within a tsunami inundation area. In the southwestern part of the project area, the areas within and around Lake El Estero are also mapped within a tsunami inundation zone. In the northeastern part of the project area, a majority of the Salinas River floodplain vicinity, including the Tembladero Slough and Blanco Drain Diversion sites are mapped within a tsunami inundation area The Monterey County Office of Emergency Services is responsible for developing and maintaining a state of readiness in preparation of any emergency, including tsunamis that could adversely affect any part of Monterey County. According to the Tsunami Incident Response Plan prepared by the Monterey County Office of Emergency Services and incorporated cities, a locally generated tsunami may occur if a large enough earthquake occurs in or near Monterey Bay. Such an earthquake could produce a tsunami that reaches shore in a matter of minutes. The plan states that within Monterey County there is a low likelihood of experiencing a tsunami. The most likely tsunami cause, though still relatively unlikely compared to other hazards, is a distant event, where there would be more than one hour to respond to a tsunami warning (Monterey County Office of Emergency Services, 2007).

Dam or Levee Failure

Dams located within the project vicinity include Los Padres and San Clemente dams on the Carmel River; and Nacimiento and San Antonio dams on the Salinas River. Historically, CalAm diverted surface water supplies from the Carmel River at Los Padres and San Clemente dams to serve CalAm's Monterey District service area. However, the storage capacity of both dams has been reduced by the gradual accumulation of sediment over the years of operation. Storage capacity at Los Padres Reservoir has been reduced by 40% as compared with original capacity. San Clemente Dam will be removed in the summer of 2015. The existing storage capacity at Los Padres Reservoir is about 2% of the annual outflow of the Carmel River Watershed. As previously indicated, Nacimiento and San Antonio dams are owned and operated by the MCWRA.

The four dams are regulated by the design and operational requirements established by the DSOD. California Water Code Section 6000, et seq. and 23 California Code of Regulations (CCR) 301, et seq. establish the authority and responsibility of the DSOD, including periodic safety inspections of dams, completion of studies that predict the flood zones created by sudden dam failure, and development of emergency response plans in the advent of pending dam failure, including a program for emergency warning and evacuation. The DSOD requires the determination of a dam inundation area, which is an area downstream of a dam that would be inundated or otherwise affected by the failure of the dam and accompanying large flood flows. Based on the County-wide dam inundation map, the Proposed Project facilities that would be located within a dam inundation zone, include the following Proposed Project components: Salinas Pump Station Diversion, Salinas Treatment Facility Storage and Recovery, Reclamation Ditch Diversion, Tembladero Slough Diversion, and Blanco Drain Diversion (Monterey County, 2010).

In Monterey County, levees along portions of the Salinas and Carmel Rivers were constructed as part of U.S. Army Corps of Engineers or U.S. Department of Agriculture flood control projects or by local flood control programs administered by the MCWRA and other stakeholders. All of these levees and floodwalls are required to undergo periodic inspections for safety and performance as part of routine maintenance plans (MCWRA, 2008).

Sea Level Rise and Coastal Flooding

Sea level rise provides a physical measure of possible oceanic response to climate change. Average global sea level has risen between five to nine inches during the 20th century as reported by the International Panel on Climate Change (IPCC), nearly one-tenth of an inch each year (California Environmental Protection Agency, 2013). The rise in global sea level is attributed to the thermal expansion of ocean water and the melting of mountain glaciers and ice sheets around the globe. As sea level rises, higher mean sea level will make it possible for wave run-up to reach coastal dunes more frequently, undercutting at the dune toe and causing increased erosion. A 2012 study by the National Research Council (NRC) provided a sea level rise projection of 15 inches by 2040 and 28 inches by 2060, relative to 2010 for San Francisco (the closest projection to the Proposed Project). The 2040 and 2060 values were derived by fitting a curve to the “Average of Models, High” projections for 2030, 2050, and 2100 published in the NRC study (ESA/PWA, 2014).

The “State of California Sea-Level Rise Guidance Document” (California Ocean Protection Council, 2013) provides guidance for incorporating sea-level rise projections into planning and projects in California in response to Executive Order S-13-08, issued on November 14, 2008 that directed state agencies to plan for sea level rise and coastal impacts. According to this document, sea level rise is projected (using the year 2000 as a baseline) as: 0.13-0.98 feet between 2000 and 2030; 0.39-2.0 feet between 2000 and 2050; and 1.38-5.48 feet between 2000 and 2010 (California Ocean Protection Council. 2013).

Coastal erosion and flooding, an ongoing issue in Southern Monterey Bay, is also expected to increase with accelerating sea level rise. The coast of Monterey Bay is exposed to high energy waves throughout the year, with seasonal differences resulting in waves approaching from many directions. The largest waves typically occur in the late fall and winter and are associated with wave generation in the Gulf of Alaska. In the spring, smaller wave heights and shorter wave periods result from strong northwest winds. In the summer, the coast is exposed to long period south swells. Point Piños partially shelters the coast from these waves, especially farther south in the bay, toward the City of Monterey. Large waves are not the only contributing factor to coastal erosion. A common indicator of coastal erosion is the *total water level,* which is the sum of tides, wave runup on the beach, and other atmospheric conditions which affect ocean water levels. Historically, some of the most damaging wave erosion events have occurred during El Niño events, when wave directions shift more to the south and west and come less impeded into Monterey Bay. This more direct wave energy coupled with elevated ocean water levels (on the order of one foot) can cause dramatic and often devastating erosion along the Monterey Bay coast. (ESA/PWA, 2014). The only Proposed Project components that would be located in areas subject to coastal flooding due to sea level rise and the associated erosion, and storm surges is a portion of the CalAm Distribution System: Monterey Pipeline and the Lake El Estero Diversion site.

Climate Change and Hydrologic Response

Intensive investigation of climate trends over the last two decades indicates strong evidence that the lower atmosphere has been warming at an unprecedented rate during the last 50 years, and it is expected to further increase at least for the next 100 years. Warming of the climate is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level (International Panel on Climate Change 2014). Generally, a warmer air mass implies a higher capacity to hold water vapor and an increased likelihood of an acceleration of the global water cycle. Other factors being equal, warm air holds more water vapor than cool air and potential for increased precipitation as the air is lifted either by winds blowing over a mountain range, by convective activity (thunderstorms), or by a weather system front has the potential for greater precipitation intensity.

Several effects on water resources infrastructure may occur in response to global warming. Potential impacts throughout California could include changes in snowpack accumulation and melting, alteration of precipitation and runoff patterns, increasing sea level, changes in flood frequency and timing, increased droughts, increased potential for wild fires, and increased demand for groundwater (and related decreases in groundwater levels).

It is generally accepted that the observed rise in global sea level is one of the most demonstrable responses to the effects of increased global temperatures. However, sea-level rise is neither uniform across the globe nor constant at any given location. Along the California coast, sea level is also affected by changes in Pacific Ocean water temperatures during relatively short-term climatic variations including El Niño/Southern Oscillation cycle (with return periods of 3 to 5 years) and the Pacific Decadal Oscillation cycle. Additionally, the rate of sea-level change is relative significant tectonic movements. Active uplift has occurred within the study area and would act to decrease the relative rate of sea-level rise.

Some climate change models suggest possible changes in the pattern and characteristics of storms in California. The effect of global warming may be to increase the number of years with many “pineapple express” (also called “atmospheric river”) storms, events with the potential to cause flooding in the study area. The potential for increased flood magnitudes can be amplified in areas that lie near sea level by concurrent high sea level stands associated with astronomical tides, storm surges, El Niño influences, and the gradual sea-level rise). Potential impacts of sea-level rise in coastal and estuarine zones may result in changes in shoreline erosion, inundation or exposure of low-lying coastal areas, changes in storm and flood damages, shifts in extent and distribution of wetlands and other coastal habitats, changes to groundwater levels, and alterations to salinity intrusion into estuaries and groundwater systems. In addition to potential changes in the characteristics of flooding events, global warming is expected to result in changes in water quality. As sea level rises, the tidal influence will migrate landward, causing a gradual increase in salinity in surface waters and will also generally increase saltwater intrusion into the aquifer. More information about the potential impacts on the water resources conditions of the northern Monterey County area (Salinas Valley) can be found in the Greater Monterey County Integrated Regional Water Management Plan (Greater Monterey County Regional

Water Management Group, 2013) found at the following website: http://www.greatermontereyirwmp.org/documents/plan/) and the Monterey Peninsula, Carmel Bay and Southern Monterey Bay Integrated Regional Water Management Plan (Monterey Peninsula Water Management District/Denise Duffy & Associates, Inc., 2014) at the following website: http://www.mpirwm.org/IRWM%20Library/IRWMPlan%20Final_whole.pdf.

4.11.3 Regulatory Framework

4.11.3.1 Federal and State Regulations

Clean Water Act

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States (waters of the U.S.) and regulating quality standards for surface waters. Its goals are to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Under the CWA, the U.S. Environmental Protection Agency (EPA) has implemented pollution control programs and established water quality standards. The National Pollutant Discharge Elimination System (NPDES) permit program under section 402 of the CWA and enabling regulations controls water pollution by regulating point sources that discharge pollutants into waters of the United States. The EPA has delegated authority of issuing NPDES permits in California to the State Board, which has nine RWQCBs. The Central Coast RWQCB regulates water quality in the project area. The NPDES permit program is further described below.

The USACOE and EPA regulate discharge of dredged and fill material into waters of the U.S. under Section 404 of the CWA and its implementing regulations. Waters of the U.S. are defined broadly as waters susceptible to use in commerce (including waters subject to tides, interstate waters, and interstate wetlands) and other waters (such as interstate lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds) (33 CFR 328.3, 40 CFR 230.3(s)(1), 40 CFR 122.2). For regulatory purposes under the CWA, the term wetlands mean those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils conditions. Wetlands generally include swamps, marshes, bogs and similar areas (see 40 CFR 230.3(t)).

Section 401 of the CWA requires that, prior to the issuance of a federal license or permit for an activity or activities that may result in a discharge of pollutants into navigable waters, the permit applicant must first obtain a certification from the state in which the discharge would originate. A state certification indicates that the proposed activity or activities would not result in a violation of applicable water quality standards established by federal or state law, or that no water quality standards apply to the proposed activity.

Water bodies that may not be covered under USACOE jurisdiction may require a Section 401 Water Quality Certification for impact on waters of the state. Placement of structures, fill, or dredged materials into waters of the State requires Section 401 Water Quality Certification. Activities that require a federal Section 404 permit also require a Section 401 Water Quality Certification. The RWQCB issues Section 401 Water Quality Certifications and waivers.

Under the authority of CWA Section 303(d), the RWQCB and State Board list water bodies as impaired when not in compliance with designated water quality objectives and standards. Section 303(d) also requires preparation of a TMDL program for waters identified by the state as impaired. A TMDL is a quantitative assessment of a problem that affects water quality. The problem can include the presence of a pollutant, such as a heavy metal or a pesticide, or a change in a physical property of the water, such as reductions in dissolved oxygen or increases in temperature. A TMDL are established at the level necessary to implement the applicable water quality standards. A TMDL requires that all sources of pollution and all aspects of a watershed's drainage system be reviewed (both point and non-point sources) and establishes load allocations to sources to achieve water quality standards. The CWA does not expressly require implementation of TMDLs. However, the State Board has interpreted California Water Code Section 13000 et. seq. to require that implementation be addressed when TMDLs are incorporated into Basin Plans. The EPA has established regulations (40 CFR 122) requiring that NPDES permits be revised to be consistent with any approved TMDL.

The RWQCB lists numerous water bodies within the lower Salinas River watershed as impaired (see Table 4.11-1). TMDLs have been adopted on the lower Salinas Watershed for the pesticides chlorpyrifos and diazinon[2], as well as for fecal coliform, and nitrogen compounds and orthophosphate. TMDLs are under development for salts and sediment toxicity.

NPDES Waste Discharge Program

In California, the NPDES program is administered by the State Board through the RWQCBs and requires point sources to obtain NPDES permits (also called Waste Discharge Requirements in California). Point sources includes municipal and industrial wastewater facilities and stormwater There are two types of NPDES permits: individual permits tailored to an individual facility and general permits that cover multiple facilities within a specific category. Effluent limitations serve as the primary mechanism in NPDES permits for controlling discharges of pollutants to receiving waters. When developing effluent limitations for an NPDES permit, a permit writer must consider limits based on both the technology available to control the pollutants (i.e., technology-based effluent limits) and limits that are protective of the water quality standards of the receiving water (i.e., water quality-based effluent limits if technology-based limits are not sufficient to protect the water body. For inland surface waters and enclosed bays and estuaries, the water-quality-based effluent limitations are based on criteria in the National Toxics Rule and the California Toxics Rule, and objectives and beneficial uses in the Basin Plan. For ocean discharges, the Ocean Plan contains beneficial uses, water quality objectives, and effluent limitations.

NPDES Permit for MRWPCA Wastewater Treatment Plant

The NPDES permit for the MRWPCA Regional Treatment Plant regulates the treated wastewater discharge from the Regional Treatment Plant that flows into Monterey Bay through the MRWPCA outfall (MRWPCA, 2014). The permit allows for a discharge up to 81.2 mgd, and specified influent flows to the secondary treatment system (29.6 mgd average dry weather flow and 75.6 mgd peak wet weather flow). 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. In summer months, treated wastewater is diverted to the Salinas Valley Reclamation Plant to produce tertiary-treated recycled water for irrigation of 12,000 acres of farmland in the northern Salinas Valley.

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[2] For this TMDL, implementation is based on the *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* and associated monitoring program to correct the impairment and attain water quality standards.

The minimum dilution requirement for the MRWPCA effluent discharge at the outfall is 145:1 (parts seawater to effluent), which is used by the RWQCB to determine the need for water quality-based effluent limitations and if needed to calculate those limitations based on water quality objectives contained in the Ocean Plan. It also includes effluent limitations in the Ocean Plan and a monitoring and reporting program for influent to and effluent from the Regional Treatment Plant.

NPDES Construction General Permit

Construction activities on one acre or more or that disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the *NPDES General Permit for Discharges of Stormwater Runoff Associated with Construction Activity* (General Construction Permit) (SWRCB Order No. 2009-09-DWQ; Modified 2010-0014-DWQ). The State Board established the General Construction Permit program to reduce surface water impacts from construction activities. Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility.

The Proposed Project would be required to comply with the permit requirements to control stormwater discharges from all of the Proposed Project construction sites. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP should contain a site map(s) which shows the construction site perimeter, existing and proposed buildings, lots, roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP must list Best Management Practices (BMPs) the discharger will use to protect storm water runoff and the placement of those BMPs. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment. Required elements of a SWPPP include:

1. Site description addressing the elements and characteristics specific to the site;
2. Descriptions of BMPs for erosion and sediment controls;
3. BMPs for construction waste handling and disposal;
4. Implementation of approved local plans;
5. Proposed post-construction controls; and
6. Non-stormwater management.

Examples of typical construction BMPs include scheduling or limiting activities to certain times of year, installing sediment barriers such as silt fence and fiber rolls, and maintaining equipment and vehicles used for construction. Non-stormwater management measures include installing specific discharge controls during certain activities, such as paving operations, vehicle and equipment washing and fueling. The RWQCB has identified BMPs to effectively reduce degradation of surface waters to an acceptable level. In accordance with the Construction General Permit, a Rain Event Action Plan would be required to ensure that active construction sites have adequate erosion and sediment controls in place prior to the onset of a storm event, even if construction is planned only during the dry season.

NPDES General Permit for Discharges with Low Threat to Water Quality

Construction of the proposed facilities would require excavation and trenching activities. Such activities in areas with shallow groundwater or that are located adjacent to surface water bodies could require dewatering to create a dry area. Discharges of non-stormwater from a trench or excavation that contains sediments or other pollutants to sanitary sewer, storm drain systems, creek beds (even if dry), or receiving waters is prohibited. However, discharges of dewatering effluent are conditionally exempt. The RWQCB requires that the dewatering effluent be tested for possible pollutants; the analytical constituents for these tests are generally determined based on the source of the water, the land use history of the construction site, and the potential for the effluent to impact the quality of the receiving water body.

The *Waste Discharge Requirements and NPDES General Permit for Discharges with Low Threat to Water Quality (Order No. R3-2011-0223, NPDES No. CAG993001, amended)* (RWQCB, 2011c) applies to low-threat discharges, which are defined as discharges containing minimal amounts of pollutants and posing little or no threat to water quality and the environment. Discharges that meet the following criteria are covered under this permit:

a. Pollutant concentrations in the discharge do not: (1) cause, (2) have a reasonable potential to cause, or (3) contribute to an excursion above any applicable water quality objectives, including prohibitions of discharge;

b. The discharge does not include water added for the purpose of diluting pollutant concentrations;

c. Pollutant concentrations in the discharge will not cause or contribute to degradation of water quality or impair beneficial uses of receiving waters;

d. Pollutant concentrations in the discharge do not exceed the limits in the permit unless the Executive Officer determines that the applicable water quality control plan (i.e., Ocean Plan and/or State Implementation Policy) does not require effluent limits;

e. The discharge does not cause acute or chronic toxicity in receiving waters; and

f. The discharger demonstrates the ability to comply with the requirements of this General Permit.

The project-related discharges that could fall under this General Permit include discharges of: water produced from one-time draining of existing pipelines to construct new connections; and disinfection water from these same existing pipelines and newly constructed pipelines before being put into service, all of which would be discharged into surface waters or conveyances thereto. These discharges may be treated and discharged on a continuous or a batch basis. For discharges from construction sites smaller than one acre that are part of a larger common plan of development or that may cause significant water quality impacts, the discharge may require coverage under the construction stormwater permit or an individual NPDES permit.

Nonpoint Source Pollution Control Program

In accordance with Section 319 of the Clean Water Act and Section 6217 of the CZARA of 1990, SWRCB and the California Coastal Commission jointly submitted the Plan for California's Nonpoint Source (NPS) Pollution Control Program to the USEPA and NOAA on February 4, 2000. The NPS Pollution Control Program provides a single unified, coordinated statewide approach to address nonpoint source pollution. A total of 28 state agencies are working collaboratively through the Interagency Coordinating Committee to implement the NPS Pollution Control Program. California's Critical Coastal Areas (CCA) Program is a non-regulatory planning tool to foster collaboration among local stakeholders and government agencies, to better coordinate resources and focus efforts on coastal-zone watershed areas in critical need of protection from polluted runoff. A coastal area is designated as a CCA if it: has a 1998 303(d)-listed impaired coastal water body that flows into a Marine Managed Areas; flows into a Wildlife Refuge or Waterfront Park/Beach; flows into a marine State Water Quality Protection Area (also known as ASBS);[3] or was on the original 1995 CCA list, which is comprised of watersheds that flow into an 1994 303(d)-listed impaired bay or estuary. The CCAs in the project area and vicinity include the Elkhorn Slough, Old Salinas River Estuary, Salinas River, Carmel Bay, Point Lobos, and Pacific Grove Marine Gardens and Hopkins Marine Life Refuge (CCC, 2014).

NPDES Municipal Stormwater Permit

The NPDES General Permit for Waste Discharge Requirements (WDRs) for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) (Order No. 2013-001-DWQ, NPDES No. CAS000004) regulates stormwater discharges from small Municipal Separate Storm Sewer Systems (MS4) into waters of the U.S. (SWRCB, 2013b). An “MS4” is defined as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) designed or used for collecting or conveying stormwater; (ii) which is not a combined sewer; and (iii) which is not part of a Publicly Owned Treatment Works (POTW) as defined at Title 40 of the Code of Federal Regulations (CFR) §122.2.

The Phase II Municipal General Permit requires regulated small MS4s to develop and implement BMPs, measurable goals, and timetables for implementation, designed to reduce the discharge of pollutants to the maximum extent practicable and to protect water quality.[4] The permittees under the small MS4 (Phase II) General Permit[5] in the project area include Monterey County and cities therein. Each permittee is required to prepare and implement a stormwater management plan (SWMP) and regulate stormwater runoff from development and redevelopment projects through post-construction stormwater management requirements.

The proposed aboveground facilities such as the Source Water Diversion and Storage sites, the Treatment Facilities at the Regional Treatment Plant, the Booster Pump Station, and the Injection Well Facilities would be subject to the stormwater control requirements in the respective local jurisdictions.

A Memorandum of Agreement for the Monterey Regional Stormwater Pollution Prevention Program was prepared and executed by MRWPCA and by the entities in the southern Monterey Bay area (Monterey County and cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside) to form the Monterey Regional Stormwater Management Program (MRSWMP). MRWPCA acts as the administrative agent for the MRSWMP. The purpose of the MRSWMP is to implement and enforce a series of BMPs to reduce the discharge of pollutants from the MS4s to the “maximum extent practicable,” to protect water quality, and to satisfy the appropriate water quality requirements of the CWA. The Phase II Program contains six Minimum Control Measures:

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3 The SWRCB monitors and maintains water quality in a total of 34 ASBS along the California coast.

4 Phase I stormwater permits provide permit coverage for medium (serving between 100,000 and 250,000 people) and large (serving 250,000 people) municipalities.

5 Phase II stormwater permits provide permit coverage for smaller municipalities (populations less than 100,000), including non-traditional Small MS4s, which are facilities such as military bases, public campuses, prisons, and hospital complexes.

- Public Education and Outreach;
- Public Participation/Involvement;
- Illicit Discharge Detection and Elimination;
- Construction Site Runoff Control;
- Post-Construction Runoff Control; and
- Pollution Prevention/Good Housekeeping.

The MRSWMP lists BMPs and associated Measurable Goals for the six Minimum Control Measures. The Measurable Goals must include, as appropriate, the months and years for scheduled actions, including interim milestones and frequency of the action. It is through the implementation and evaluation of these BMPs and Measurable Goals that the permittees ensure that the objectives of the Phase II NPDES Program are met (MRSWMP, 2015).

The Model Urban Runoff Program (MURP)—a water quality program under the Statewide NPS program—is a comprehensive guide developed for the local agencies to address polluted runoff in the urban environment. The MURP provides options to help small municipalities develop individual urban runoff programs. Each member or permittee is responsible for complying with the NPDES permit conditions. The local municipalities would require the proposed project to comply with the stormwater control requirements in their individual jurisdictions under the MS4 permit and require implementation of erosion and stormwater control measures to reduce any long term runoff effects from the facilities (MRSWMP, 2015).

In July 2013, the Central Coast RWQCB adopted Resolution No. R3-2013-0032 c, which prescribes new Post-Construction Requirements for projects that create or replace 2,500 square feet or more of impervious area and receive their first discretionary approval for design elements after March 6, 2014. **Table 4.11-11** summarizes the new post-construction requirements for different categories of projects, which would include the Proposed Project components.

Table 4.11-11
Overview of Post-Construction Requirements for Stormwater Management

Project Categories	Performance Requirements
Tier 1 Projects Projects that create or replace 2,500 square feet or more of impervious surface.	**Implement One or More Low Impact Design (LID) Measures:** Limit disturbance of natural drainage features. Limit clearing, grading, and soil compaction. Minimize impervious surfaces. Minimize runoff by dispersing runoff to landscape or using permeable pavements.
Tier 2 Projects Projects that create or replace 5,000 square feet or more net impervious surface.	**Tier 1 requirements, plus treat site runoff:** Treat runoff generated by the 85th percentile 24-hour storm event with an approved and appropriately sized LID treatment system prior to discharge from the site.
Tier 3 Projects Projects that create or replace 15,000 square feet or more of impervious surface.	**Tier 2 requirements, plus:** Prevent offsite discharge from events up to the 95th percentile rainfall event using Stormwater Control Measures.
Tier 4 Projects Projects that create or replace 22,500 square feet of impervious surface.	**Tier 3 requirements, plus:** Control peak flows to not exceed pre-project flows for the 2-year through 10-year events.
SOURCE: MRSWMP, 2014.	

Porter-Cologne Water Quality Control Act

The Porter-Cologne Act (Division 7 of the California Water Code, Section 13000) is the principal law governing water quality regulation in California. It establishes a comprehensive program to protect water quality and the beneficial uses of water. The Porter-Cologne Act applies to surface waters, wetlands, and groundwater, and to both point and nonpoint sources of pollution. Pursuant to the Porter-Cologne Act, it is the policy of the State of California that:

- The quality of all the waters of the State shall be protected.
- All activities and factors affecting the quality of water shall be regulated to attain the highest water quality within reason.
- The state must be prepared to exercise its full power and jurisdiction to protect the quality of water in the state from degradation.

The Porter-Cologne Act defines water quality objectives as the limits or levels of water constituents that are established for reasonable protection of beneficial uses. The Porter-Cologne Act allows the State Board to adopt statewide water quality control plans or basin plans, which serve as the legal, technical, and programmatic basis of water quality regulation for a region. The act also authorizes the NPDES program under the Clean Water Act, which establishes effluent limitations and water quality requirements for discharges to waters of the state.

Under the Porter-Cologne Act, any person or entity discharging or proposing to discharge waste within the region (except discharges into a community sewer system) that could affect the quality of the waters of the state is required to file a Report of Waste Discharge. The State Board or RWQCB reviews the nature of the proposed discharge and adopts Waste Discharge Requirements to protect the beneficial uses of waters of the state. Waste discharge requirements could be adopted for an individual discharge, or a specific type of discharges in the form of a general permit. California Water Code Section 13269 authorizes the State or RWQCB to waive waste discharge requirements for specific discharges or specific types of discharges where such a waiver is consistent with any applicable state or regional water quality control plan and is in the public interest. The following are general waivers that are applicable to the Proposed Project

General Waiver of Waste Discharge Requirements for Specific Types of Discharges

The *General Waiver of Waste Discharge Requirements for Specific Types of Discharges* (Resolution R3-2014-0041) (General Waiver) (RWQCB, 2014a) amended RWQCB Resolution R3-2008-0010 of the same name and contains specific conditions for the specific discharges and is consistent with the RWQCB Basin Plan. Waivers may be granted for discharges to land and may not be granted for discharges to surface waters or conveyances thereto that are subject to the federal CWA requirements for NPDES permits.

Well drilling would generate muds and clay slurry. In the case of muds, the threat to water quality of such materials depends primarily on the additives used. If the slurry material to be spread is free of appreciable additives (additive quantities in conformance with industry standards), the used slurry may be spread on pastures or fields, provided that contact with surface water is avoided and runoff is prevented (RWQCB, 2014a). The muds and clay slurry generated during the drilling and development of the Proposed Project's injection wells would fall under the category of "Water Supply Well Drilling Muds" in the General Waiver.

The water extracted during well development falls under the category of "water supply discharges" in the General Waiver (RWQCB, 2014a). Water supply discharges that would occur under the Proposed Project include all water produced during well drilling and development. Under the General Waiver, these discharges would be waived from waste discharge requirements and from the requirement of submitting a waste discharge report; however, they would be subject to the following conditions (RWQCB, 2014a):

Water Supply Well Drilling Muds

- The discharge shall be spread over an undisturbed, vegetated area capable of absorbing the top-hole water and filtering solids in the discharge, and spread in a manner that prevents a direct discharge to surface waters.
- The pH of the discharge shall be between 6.5 and 8.3.
- The discharge shall not contain oil or grease.
- The discharge area shall not be within 100 feet of a stream, body of water, or wetland, nor within streamside riparian corridors.

Water Supply Discharges

- The discharger shall implement appropriate management practices to dissipate energy and prevent erosion.
- The discharger shall implement appropriate management practices to preclude discharge to surface waters and surface water drainage courses.
- The discharger shall immediately notify the Central Coast RWQCB staff of any discharge to surface waters or surface water drainage courses. The discharge shall not have chlorine or bromine concentrations that could impact groundwater quality.
- The discharge area shall not be located within 100 feet of a stream, body of water, or wetland.

Anti-degradation Policies

California's anti-degradation policies are found in Resolution 68-16, Policy with Respect to Maintaining Higher Quality Waters in California, and Resolution 88-63, Sources of Drinking Water Policy.[6] These resolutions are binding on all State agencies. They apply to both surface waters and groundwaters, protect both existing and potential beneficial uses of surface water and groundwater, and are incorporated into RWQCB Basin Plans. These policies apply to the projects components that may affect water quality, including the Injection Well Facilities (as discussed in detail in **Chapter 3**, and **Section 4.10, Hydrology and Water Quality: Groundwater**, and other impacts addressed in **Section 4.11.4, below**.

Resolution 68-16 (Anti-degradation Policy)

The Anti-degradation Policy requires that existing high water quality be maintained to the maximum extent possible, but allows lowering of water quality if the change is "consistent with maximum benefit to the people of the state, will not unreasonably effect present and anticipated use of such water (including drinking), and will not result in water quality less than prescribed in policies." The Anti-degradation Policy also stipulates that any discharge to existing high quality waters will be required to "meet waste discharge requirements which will result in the best

[6] See http://www.swrcb.ca.gov/plans_policies/.

practicable treatment or control of the discharge to ensure that (a) pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."

Resolution 88-63 (Sources of Drinking Water Policy)

The Sources of Drinking Water Policy designates the municipal and domestic supply (MUN) beneficial use for all surface waters and groundwater except for those: (1) with total dissolved solids (TDS) exceeding 3,000 mg/L, (2) with contamination that cannot reasonably be treated for domestic use, (3) where there is insufficient water supply, (4) in systems designed for wastewater collection or conveying or holding agricultural drainage, or (5) regulated as a geothermal energy producing source. Resolution 88-63 addresses only designation of water as drinking water source; it does not establish objectives for constituents that threaten source waters designated as MUN.

City of Salinas Discharge Permits

The Salinas Treatment Facility operates under a Waste Discharge Requirements Order R3-2003-0008 issued in 2002 by the RWQCB. The treatment facility is designed and permitted for an average daily flow of 4.0 MGD with a peak flow of 6.8 MGD. The system operates year round with higher flows in the spring and summer months due to the significant increase in agricultural product processing. The City also has an NPDES permit (number CA0049981, order R3-2012-0005) for municipal stormwater discharges.

Coastal Zone Act Reauthorization Amendments (CZARA) Section 6217

The Coastal Nonpoint Pollution Control Program (Section 6217) addresses nonpoint pollution problems in coastal waters. Section 6217 requires states and territories with approved Coastal Zone Management Programs to develop Coastal Nonpoint Pollution Control Programs. In its program, a state or territory describes how it will implement nonpoint source pollution controls, known as management measures, that conform with those described in Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters. This program is administered jointly with the NOAA. As of 2008, 34 states and territories participate in this program.

Flood Regulations

The Federal Emergency Management Agency (FEMA) is tasked with responding to, planning for, recovering from, and mitigating against disasters. FEMA is responsible for determining flood elevations and floodplain boundaries based on U.S. Army Corps of Engineers and approved agencies' studies; for coordinating the federal response to floods, earthquakes, hurricanes, and other natural or man-made disasters; and for providing disaster assistance to states, communities and individuals. FEMA prepares and distributes the Flood Insurance Rate Maps, which are used in the National Flood Insurance Program. These maps identify the locations of special flood hazard areas, including the 100-year flood zone. As shown in **Figure 4.11-7**, the following Proposed Project components would be located partially within 100-year flood zones:

- All Source Water Diversion and Storage Sites: Salinas Pump Station, Salinas Treatment Facility Storage and Recovery, Reclamation Ditch, Tembladero Slough, Blanco Drain, and Lake El Estero
- Product Water Conveyance Pipeline Alignment (small portions of both alignments)
- CalAm Distribution System: Monterey Pipeline (portions)

These facilities comprise diversion structures, wet wells, pumps, and pipelines. Neither the Treatment Facilities at the Regional Treatment Plant nor the Injection Well Facilities would be located within the 100-year flood zone.

National Marine Sanctuary Program Regulations

The National Oceanic and Atmospheric Administration has entered into a Memorandum of Agreement with the state of California, Environmental Protection Agency, and the Association of Monterey Bay Area Governments regarding the Monterey Bay National Marine Sanctuary regulations relating to water quality within state waters within the sanctuary (Monterey Bay National Marine Sanctuary, 2008). The Memorandum of Agreement provides for Monterey Bay National Marine Sanctuary review authority for the following permits within the Sanctuary:

- National Pollutant Discharge Elimination System permits issued by the State of California under Section 13377 of the California Water Code; and
- Waste Discharge Requirements issued by the State of California under Section 13263 of the California Water Code.

The Memorandum of Agreement specifies how the review process for applications for leases, licenses, permits, approvals, or other authorizations will be administered within State waters within the Sanctuary in coordination with the State permit program.

The Monterey Bay National Marine Sanctuary also implements a separate Water Quality Protection Program for the Sanctuary and tributary waters. The program is a partnership of 27 local, state, and federal government agencies (Monterey Bay National Marine Sanctuary, 2008). The program calls for education, funding, monitoring, and development of treatment facilities and assessment programs to protect water quality. The goal of the program is to enhance and protect the chemical, physical, and biological integrity of the Sanctuary. The only Proposed Project component subject to National Marine Sanctuary regulations would be any changes to MRWPCA's Regional Treatment Plant discharge permit that may be required due to the discharge of reverse osmosis concentrate using the Regional Treatment Plant ocean outfall.

Plans/Programs

Water Quality Control Plan (Basin Plan)

The Central Coast Regional Water Quality Control Board (RQWQCB) updated their Water Quality Control Plan for the Central Coastal Basin (Basin Plan) in 2011. It is intended to provide guidance on how the quality of the surface water and groundwater in the Central Coast Region should be managed to provide the highest water quality reasonably possible. The Basin Plan serves as a guidance document to the Water Board when reviewing and authorizing projects under their Section 401 authority.

The RWQCB establishes beneficial uses of surface and groundwater resources, as contained in its Water Quality Control Plan for the Central Coast. **Table 4.11-3** summarized beneficial uses identified for surface waters in the project area.

Ocean Plan

The Water Quality Control Plan for Ocean Waters of California (or Ocean Plan), adopted by the State Board in 2012, establishes water quality objectives and beneficial uses for waters of the Pacific Ocean adjacent to the California coast outside of estuaries, coastal lagoons, and enclosed bays. The Ocean Plan objectives for ocean discharges were adopted to preserve the quality of the ocean water for beneficial uses, including the protection of both human and aquatic ecosystem health. The plan establishes effluent quality requirements and management principles for specific waste discharges. The water quality requirements and objectives are incorporated into all NPDES permits. The Ocean Plan objectives relevant to the Proposed Project include:

- Marine communities, including vertebrate, invertebrate, and plant species shall not be degraded;
- Waste management systems that discharge into the ocean must be designed and operated in a manner that will maintain the indigenous marine life and a healthy and diverse marine community; and
- Waste discharged to the ocean must be essentially free of substances that will accumulate to toxic levels in marine waters, sediments or biota.

The Ocean Plan establishes objectives for many bacterial, physical, chemical, biological, and radioactive parameters. Although not applicable to the AWT Facility reverse osmosis concentrate, there is no Ocean Plan objective specifically applicable to the discharges from an advanced water treatment processes. However, State Board staff is developing an amendment to the Ocean Plan that would address issues associated with desalination facilities and the disposal of brine discharges from other sources.[7] Currently, the Water Boards regulate brine discharges from these types of facilities through the issuance of NPDES permits that contain conditions protective of aquatic life. In March 2015, State Board staff released draft Ocean Plan amendments related to desalination for public review. They are currently scheduled for State Board approval in July 2015 (RWQCB, 2014b)

For typical wastewater discharges, when released from an outfall, the wastewater and ocean water undergo rapid mixing due to the momentum and buoyancy of the discharge.[8] The mixing occurring in the rising plume is affected by the buoyancy and momentum of the discharge, a process referred to as initial dilution. The Ocean Plan objectives are to be met after the initial dilution of the discharge into the ocean. The initial dilution occurs in an area known as the zone of initial dilution (ZID). The extent of dilution in the ZID is quantified as the minimum probable initial dilution (D_m). The water quality objectives established in the Ocean Plan are adjusted by the D_m to derive the NPDES ocean discharge limits for a wastewater discharge prior to ocean dilution. The current MRWPCA wastewater discharge is governed by NPDES permit R3-2014-0013 issued by the Central Coast RWQCB that is based on the Ocean Plan objectives.

Marine Life Protection Program and other Ocean Protection/Conservation Programs

The Monterey Bay is the portion of the Pacific Ocean to which surface water runoff from the Proposed Project area would flow. The Monterey Bay in the vicinity of the Proposed Project includes the following designated conservation/protected areas (the agency that created the designation is in parentheses):

- Monterey Bay National Marine Sanctuary (National Oceanic and Atmospheric Administration),

[7] These are not applicable to the Proposed Project; however are included due to the assessment of impacts under the cumulative conditions in **Section 4.11.4.5.**

[8] Municipal wastewater effluent, being effectively fresh water, is less dense than seawater and thus rises (due to buoyancy) while it mixes with ocean water.

- California Critical Coastal Areas (California Coastal Commission),
- Areas of Special Biological Significance (State Water Resources Control Board), and
- Marine Protected Areas (California Department of Fish and Game), including the Pacific Grove State Marine Conservation Area (SMCA), Lovers Point-Julia Platt State Marine Reserve (SMR), Edward Ricketts SMCA, Hopkins State Marine Reserve, Elkhorn Slough SMCA, Moro Cojo SMR, Elkhorn Slough SMR, Carmel Bay SMCA and Point Lobos SMCA in the Proposed Project area.

Additional information about the Marine Life Protection Act and the Marine Protected Areas is provided in **Section 4.13, Marine Biological Resources**.

4.11.3.2 Regional and Local

City of Salinas Stormwater Permit

The City of Salinas is subject to a waste discharge permit for their municipal storm water discharges (Order No. R3-2012-0005 NPDES Permit No. CA0049981). This Order incorporates BMPs to reduce pollutants in stormwater discharges to the maximum extent practicable. These BMPs include erosion control, sediment control, and construction site waste management practices; the implementation of good housekeeping practices designed to control pollutants at the source, promote the use of proper waste management practices, and implement control practices to keep pollutants away from any entrance to the storm drainage system; requirements for new development and redevelopment designed to preserve pre-developed hydrologic and pollutant conditions; and requirements for development planning, and watershed characterization.

Monterey Regional Stormwater Management Program

The Monterey Regional Stormwater permit (Order No. 2013-0001 DWQ effective July 1, 2013) regulates stormwater discharges from small municipal separate storm sewer systems (MS4)[9] that include the County of Monterey and cities in the project area. To comply with the stormwater permit, the County of Monterey and the cities of Carmel-by-the-Sea, Del Rey Oaks, Marina, Monterey, Pacific Grove, Sand City, and Seaside formed the Monterey Regional Stormwater Management Program. The MRWPCA acts as the administrative agent for the Monterey Regional Stormwater Management Program. The purpose of the Monterey Regional Management Program is to implement and enforce a series of BMPs to reduce the discharge of pollutants from the small municipal storm sewer systems to meet the requirements of the Statewide Phase 2 MS4 permit and to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act. Construction of the Proposed Project facilities that would affect stormwater runoff and quality would be subject to the local stormwater control requirements in addition to the General Construction Permit.

[9] USEPA promulgated regulations, known as Phase II, requiring permits for stormwater discharges from Small MS4s (that serve a population of up to 100,000) and from construction sites disturbing between one and five acres of land (discussed under General Construction Permit above).

Monterey County General Plan

Goals and policies regarding conservation and preservation of hydrologic resources and water quality and associated developmental constraints are found in Chapter 4 of the Monterey County General Plan (2010). The following goals and policies are relevant to the Proposed Project:

Goal S-3: Ensure effective storm drainage and flood control to protect life, property, and the environment.

Policy S-3.7: The MCWRA shall prepare a Flood Criteria or Drainage Design Manual that establishes floodplain management policies, drainage standards and criteria, stormwater detention, and erosion control and stormwater quality protection measures in order to prevent significant impacts from flooding and ensure that development does not increase flooding risk over present conditions. The manual shall include, as appropriate, hydrologic and hydraulic analysis procedures, procedures to assess stream geomorphology and stability, potential development impacts on streams, and design guidelines for channel design, including biotechnical bank stabilization. Until the Drainage Design Manual is prepared, the County shall continue to apply existing policies and ordinances to manage floodplains and minimize flood risk, erosion control, and water quality impacts.

Floodplain Management Plan

The Monterey County Floodplain Management Plan was first developed in 2002, and subsequently updated in 2008, to identify the flooding sources affecting properties, and to establish an implementation plan to reduce flooding and flood related hazards, and to ensure the natural and beneficial functions of our floodplains are protected. This requires utilization of existing programs and resources, involving those public agencies responsible for regulating development in special flood hazard areas in the planning process, and ensuring that the policies and programs identified in the implementation plan are carried out. The 2008 Floodplain Management Plan update was prepared by the MCWRA Floodplain Management and Development Review Section under the supervision of the Monterey County Floodplain Administrator. Monterey County has been a voluntary participant in the Community Rating System since October 1, 1991. The 2008 Floodplain Management Plan identified 107 Repetitive Loss Properties in Monterey County.

Local Codes

This section describes the local municipal and Monterey County codes relevant to surface water hydrology and water quality.

Monterey County Code

The following chapters in the Monterey County code (2013) have provisions relevant to hydrology, water quality, and flooding in the project area:

- Chapter 16.08 (Grading) sets rules and regulations to control all grading, including excavations, earthwork, road construction, fills and embankments, and establishes the administration procedure for issuance of permits; and provides for approval of plans and inspections of grading construction.
- Chapter 16.12 (Erosion Control) requires that specific design considerations be incorporated into projects to reduce the potential of erosion and that an erosion control plan be approved by the County prior to initiation of grading activities.

- Chapter 16.16 (Development of Floodplains) establishes methods of reducing flood losses such as controlling the alteration of natural floodplains and requiring new construction in the floodplain to incorporate floodproofing measures (Floodplain regulations in the county extend to areas within 200 feet of rivers or within 50 feet of watercourses).

City of Marina Municipal Code

The following chapters in the Marina City code (2007) have provisions relevant to flooding and erosion control in the project area:

- Chapter 15.48 (Flood Damage Protection) sets requirements for new stormwater drainage facilities, including within special flood hazard areas (i.e., subject to 1% or greater change of flooding in a given year, which is the FEMA 100-year floodplain).
- Chapter 16.08.080 (Erosion Control) requires implementation of silt basins, structures, planting, or other forms of erosion control when deemed necessary by the Planning Commission.

City of Seaside Municipal Code

The following chapter in the Seaside City code (2011) has provisions relevant to surface water hydrology and water quality in the project area:

Chapter 8.46 under Title 8, Health and Safety (Urban Stormwater Quality Management and Discharge Control) would apply to all water entering the storm drain system generated on any developed and undeveloped lands lying within the city. The chapter lists requirements to prevent, control, and reduce stormwater pollutants, protect water courses, and notify emergency response officials in the event of a chemical release.

City of Sand City Municipal Code

The following title in the Sand City code (2011) has provisions relevant to stormwater management in the project area:

Title 13 (Public Services), Chapter 13.05 (Stormwater Management) intends to protect and enhance surface water quality by reducing pollutants in stormwater discharges to the maximum extent practicable and by prohibiting non-stormwater discharges to the storm drain system. The chapter applies to all water entering the storm drain system generated on any developed and undeveloped lands lying within the Sand City. For example, Section 13.05.060 prohibits non-stormwater discharges or any illegal discharges into municipal storm drain systems or water courses. Section 13.05.100 requires prevention, control, and reduction of stormwater pollutants, which apply to construction sites.

City of Monterey Municipal Code

The following chapters in the City of Monterey Municipal code (2013) have provisions relevant to surface water hydrology and water quality in the project area:

Chapter 9 (Building Regulations, Article 7 Flood Damage Prevention), Section 9-70.1 (Establishment of Development Permit) requires a Development Permit prior to the start of construction within special flood hazard areas, as established in Section 9-69. The Development Permit application can be obtained from the Floodplain Administrator. As part of the application process, applicants must provide a scaled site plan prepared by a registered civil engineer that shows: the nature, location, dimensions, and elevations of the area in question; existing and proposed structures; cut and fill areas; stockpile and storage areas; and site drainage.

Chapter 31 (Stormwater Management Utility, Article 2.Urban Stormwater Quality Management and Discharge Control), Section 31.5-15 (Requirement to Prevent, Control, and Reduce Storm Water Pollutants, New Development and Redevelopment) includes that the City may require any owner or person developing real property to identify appropriate BMPs to control the volume, rate, and potential pollutant load of stormwater runoff from new development and redevelopment projects as may be appropriate to minimize the generation, transport and discharge of pollutants. The City shall incorporate such requirements in any land use entitlement and construction or building-related permit to be issued relative to such development or redevelopment. The owner and developer shall comply with the terms, provisions, and conditions of such land use entitlements and building permits as required in this Article and the City Stormwater Utility Ordinance, Chapter 31.5, Article 1. The requirements may also include a combination of structural and non-structural BMPs along with their long-term operation and maintenance.

City of Pacific Grove Municipal Code

The following chapters in the City of Pacific Grove City municipal code (2013) have provisions relevant to hydrology, water quality, and flooding in the project area:

Chapter 11.97 (Community Floodplain) in Section 11.97.120 (Standards of Construction) states that if a proposed building site is in a flood-prone area, all new construction and substantial improvements, including manufactured homes, shall:

a. Be designed (or modified) and adequately anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy; and

b. Be constructed:

    1. With materials and utility equipment resistant to flood damage;

    2. Using methods and practices that minimize flood damage; and

    3. With electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

Plans and Policies Consistency Analysis

Table 4.11-12 describes the state, regional, and local land use plans, policies, and regulations pertaining to hydrology and water quality of surface and marine waters that are relevant to the Proposed Project and that were adopted for the purpose of avoiding or mitigating an environmental effect. Also included in **Table 4.11-12** is an analysis of project consistency with these plans, policies, and regulations. In some cases, policies contain requirements that are included within enforceable regulations of the relevant jurisdiction. Where the analysis concludes the project would not conflict with the applicable plan, policy, or regulations, the finding and rationale are provided. Where the analysis concludes the project may conflict with the applicable plan, policy, or regulation, the reader is referred to **Section 4.11.4, Environmental Impacts and Mitigation Measures,** for additional discussion, including the relevant impact determination and mitigation measures.

Table 4.11-12
Applicable Local Land Use Plans, Policies, and Regulations - Hydrology and Water Quality: Surface Water

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Policy or Program	Project Consistency with Policies and Programs
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 16.08 – Grading	Salinas Treatment Facility Storage and Recovery Reclamation Ditch Diversion Tembladero Slough Diversion Blanco Drain Diversion Treatment Facilities at Regional Treatment Plant RUWAP Alignment Option Coastal Alignment Option	**Chapter 16.08** - The Monterey County Grading Ordinance generally regulates grading activities that involve more than 100 cubic yards of excavation and fill. Minor fills and excavations ("cuts") of less than 100 cubic yards that are not intended to provide foundations for structures, or that are very shallow and nearly flat, are typically exempt from the ordinance, as are shallow footings for small structures. Submittal requirements for a County grading permit include site plans, existing contours and proposed contour changes, an estimate of the volume of earth to be moved, and geotechnical (soils) reports. Grading activities that involve over 5,000 cubic yards of soil must include detailed plans signed by a state-licensed civil engineer. Grading is not allowed to obstruct storm drainage or cause siltation of a waterway. All grading requires implementation of temporary and permanent erosion-control measures. Grading within 50 feet of a watercourse, or within 200 feet of a river, is regulated in the Monterey County Zoning Ordinance floodplain regulations. The Monterey County Grading Ordinance requires a soil engineering and engineering geology report (Section 16.08.110: Permit – Soil Engineering and Engineering Geology Reports [Ordinance 4029, 1999; Ordinance 2534, Section 110, 1979], unless waived by the Building Official because information of record is available showing such data is not needed. The soil engineering and engineering geology report must include the following: Data regarding the properties, distribution and strength of existing soils b. Recommendations for grading and corrective measures for project design, as appropriate c. The recommendations from the soil engineering and engineering geology report must be incorporated in the grading plans and construction specifications.	**Consistent:** The Proposed Project would be subject to the State Construction General Permit, which requires the implementation of specific construction-related BMPs to minimize erosion and soil loss, and prevent stormwater pollutants from leaving the construction sites.
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 16.12 - Erosion Control	Salinas Treatment Facility Storage and Recovery Reclamation Ditch Diversion Tembladero Slough Diversion Blanco Drain Diversion Treatment Facilities at Regional Treatment Plant RUWAP Alignment Option Coastal Alignment Option	**Chapter 16.12 - Erosion Control.** Requires that specific design considerations be incorporated into projects to reduce the potential of erosion and that an erosion control plan be approved by the County prior to initiation of grading activities.	**Consistent:** The Proposed Project would be subject to the State Construction General Permit, which requires the implementation of specific construction-related BMPs to minimize erosion and soil loss, and prevent stormwater pollutants from leaving the construction sites.
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 16.16 – Develop-ment of Floodplain s	Salinas Treatment Facility Storage and Recovery Reclamation Ditch Diversion Tembladero Slough Diversion Blanco Drain Diversion Treatment Facilities at Regional Treatment Plant RUWAP Alignment Option Coastal Alignment Option	**Chapter 16.16 - Development of Floodplains**. Establishes methods of reducing flood losses such as controlling the alteration of natural floodplains and requiring new construction in the floodplain to incorporate flood-proofing measures (Floodplain regulations in the county extend to areas within 200 feet of rivers or within 50 feet of watercourses).	**Consistent:** Although aboveground facilities or developments are proposed under the Proposed Project that would be located in 100-year floodplain areas all of the facilities would conform to the guidelines of the FEMA and National Flood Insurance Program and ordnances of the County, as applicable.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conser-vation and Open Space	Salinas Treatment Facility Storage and Recovery Reclamation Ditch Diversion Tembladero Slough Diversion Blanco Drain Diversion Treatment Facilities at Regional Treatment Plant RUWAP Alignment Option Coastal Alignment Option	**Policy OS-3.3**: Criteria for studies to evaluate and address, through appropriate designs and BMPs, geologic and hydrologic constraints and hazards conditions, such as slope and soil instability, moderate and high erosion hazards, and drainage, water quality, and stream stability problems created by increased stormwater runoff, shall be established for new development and changes in land use designations.	**Consistent:** The Proposed Project would be constructed and operated in conformance with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-001-DWQ and NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2014-0041]), which require implementation of BMPs and measures to control and reduce erosion and pollutant discharge. The State requirements are incorporated in the County's Municipal Code and the municipal stormwater permit.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conser-vation and Open Space	Salinas Treatment Facility Storage and Recovery Reclamation Ditch Diversion Tembladero Slough Diversion Blanco Drain Diversion Treatment Facilities at Regional Treatment Plant RUWAP Alignment Option Coastal Alignment Option	**Policy OS-4.2**: Direct and indirect discharges of harmful substances into marine waters, rivers or streams shall not exceed state or federal standards.	**Consistent:** The Proposed Project would be constructed and operated in conformance with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-001-DWQ and NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2014-0041], NPDES No. CAS000004 and Order No. R3-2014-0013, NPDES Permit No. CA0048551 for the Monterey Regional Water Pollution Control Agency Treatment Plant), which require implementation of BMPs and measures to control and reduce pollutants in the point and nonpoint discharges (e.g., stormwater runoff and brine discharge) from project facilities. The State requirements are incorporated in the County's Municipal Code and the municipal stormwater permit, and would be incorporated into any new permits obtained prior to project operation such as the NPDES permit for discharges from the existing MRWPCA outfall.
County of Monterey (coastal zone and inland	Monterey County General Plan	Conser-vation and Open Space	Salinas Treatment Facility Storage and Recovery Reclamation Ditch Diversion Tembladero Slough Diversion Blanco Drain Diversion	**Policy OS-4.3**: Estuaries, salt and fresh water marshes, tide pools, wetlands, sloughs, river and stream mouth areas, plus all waterways that drain and have impact on State Monterey County General Plan designated Areas of Special Biological Significance (ASBS) shall be protected, maintained, and preserved in accordance with state and federal water quality regulations.	**Consistent:** The Proposed Project would be constructed and operated in conformance with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-001-DWQ and NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2014-0041], NPDES No. CAS000004 and Order No. R3-2014-0013, NPDES Permit No. CA0048551 for the Monterey Regional Water Pollution Control Agency Treatment

Table 4.11-12
Applicable Local Land Use Plans, Policies, and Regulations - Hydrology and Water Quality: Surface Water

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Policy or Program	Project Consistency with Policies and Programs
areas)			Treatment Facilities at Regional Treatment Plant RUWAP Alignment Option Coastal Alignment Option		Plant), which require implementation of BMPs and measures to control and reduce pollutants in the discharges from project facilities, which eventually drain into the designated ASBSs. The State requirements are incorporated in the County's Municipal Code and the municipal stormwater permit, and would be incorporated into any new permits obtained prior to project operation such as the NPDES permit for discharges into Bay through the existing MRWPCA outfall.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Salinas Treatment Facility Storage and Recovery Reclamation Ditch Diversion Tembladero Slough Diversion Blanco Drain Diversion Treatment Facilities at Regional Treatment Plant RUWAP Alignment Option Coastal Alignment Option	**Policy S-2.3**: All new development, including filling, grading, and construction, within designated 100-year floodplain areas shall conform to the guidelines of FEMA and the National Flood Insurance Program and ordinances established by the County Board of Supervisors. With the exception of the construction of structures, Routine and Ongoing Agricultural Activities shall be exempt from this policy.	**Consistent:** Although aboveground facilities or developments are proposed under the Proposed Project that would be located in 100-year floodplain areas all of the facilities would conform to the guidelines of the FEMA and National Flood Insurance Program and ordnances of the County, as applicable.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Salinas Treatment Facility Storage and Recovery Reclamation Ditch Diversion Tembladero Slough Diversion Blanco Drain Diversion Treatment Facilities at Regional Treatment Plant RUWAP Alignment Option Coastal Alignment Option	**Policy S-2.6**: Drainage and flood control improvements needed to mitigate flood hazard impacts associated with potential development in the 100-year floodplain shall be determined prior to approval of new development and shall be constructed concurrently with the development.	**Consistent:** Although aboveground facilities or developments are proposed under the Proposed Project that would be located in 100-year floodplain areas all of the facilities would conform to the guidelines of the FEMA and National Flood Insurance Program and ordnances of the County, as applicable.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Salinas Treatment Facility Storage and Recovery Reclamation Ditch Diversion Tembladero Slough Diversion Blanco Drain Diversion Treatment Facilities at Regional Treatment Plant RUWAP Alignment Option Coastal Alignment Option	**Policy S-2.8**: Alternative project designs and densities to minimize development in the floodplain shall be considered and evaluated	**Consistent:** Although aboveground facilities or developments are proposed under the Proposed Project that would be located in 100-year floodplain areas all of the facilities would conform to the guidelines of the FEMA and National Flood Insurance Program and ordnances of the County.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Salinas Treatment Facility Storage and Recovery Reclamation Ditch Diversion Tembladero Slough Diversion Blanco Drain Diversion Treatment Facilities at Regional Treatment Plant RUWAP Alignment Option Coastal Alignment Option	**Policy S-3.1**: Post-development, off-site peak flow drainage from the area being developed shall not be greater than pre-development peak flow drainage. On-site improvements or other methods for storm water detention shall be required to maintain post-development, off-site, peak flows at no greater than predevelopment levels, where appropriate, as determined by the MCWRA.	**Consistent:** The Proposed Project would be subject to State WDRs (NPDES Phase II Permit, Order No. 2013-001-DWQ and NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2014-0041], NPDES No. CAS000004 and Order No. R3-2014-0013) which are set forth in the local municipal stormwater permit and which require implementation of site design and stormwater control measures such that post-project flow drainage from the site must match pre-project flows.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Salinas Treatment Facility Storage and Recovery Reclamation Ditch Diversion Tembladero Slough Diversion Blanco Drain Diversion Treatment Facilities at Regional Treatment Plant RUWAP Alignment Option Coastal Alignment Option	**Policy S-3.2**: Best Management Practices to protect groundwater and surface water quality shall be incorporated into all development.	**Consistent:** The Proposed Project would be constructed and operated in conformance with State Construction General Permit and WDRs, which require implementation of BMPs and measures to control and reduce pollutants in the discharges from project facilities that could affect water quality. The State requirements are incorporated in the County's Municipal Code and the municipal stormwater permit, and would be incorporated into any new permits obtained prior to project operation. The issue of groundwater quality is addressed further in EIR Section 4.10, Hydrology and Water Quality: Groundwater.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Salinas Treatment Facility Storage and Recovery Reclamation Ditch Diversion Tembladero Slough Diversion Blanco Drain Diversion Treatment Facilities at Regional Treatment Plant RUWAP Alignment Option Coastal Alignment Option	**Policy S-3.3**: Drainage facilities to mitigate the post-development peak flow impact of new development shall be installed concurrent with new development	**Consistent:** The Proposed Project would be subject to State WDRs, including the municipal stormwater permit, which require implementation of site design and stormwater control measures such that post-project flow drainage from the site must match pre-project flows.

Table 4.11-12
Applicable Local Land Use Plans, Policies, and Regulations - Hydrology and Water Quality: Surface Water

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Policy or Program	Project Consistency with Policies and Programs
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Salinas Treatment Facility Storage and Recovery Reclamation Ditch Diversion Tembladero Slough Diversion Blanco Drain Diversion Treatment Facilities at Regional Treatment Plant RUWAP Alignment Option Coastal Alignment Option	**Policy S-3.5:** Runoff Performance Standards that result in an array of site planning and design techniques to reduce storm flows plus capture and recharge runoff shall be developed and implemented, where appropriate, as determined by the MCWRA.	**Consistent:** The Proposed Project would be subject to State WDRs, the Clean Water Act Sections 404/401 and California Fish and Wildlife Code Section 1602 requirements, including the local municipal stormwater permit, which require implementation of site design and stormwater control measures such that post-project flows from the site must not exceed pre-project flows.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Salinas Treatment Facility Storage and Recovery Reclamation Ditch Diversion Tembladero Slough Diversion Blanco Drain Diversion Treatment Facilities at Regional Treatment Plant RUWAP Alignment Option Coastal Alignment Option	**Policy S-3.9:** In order to minimize urban runoff affecting water quality, the County shall require all future development within urban and suburban areas to implement Best Management Practices (BMPs) as approved in the Monterey Regional Storm Water Management Program which are designed to incorporate Low Impact Development techniques. BMPs may include, but are not limited to, grassy swales, rain gardens, bioretention cells, and tree box filters. BMPs should preserve as much native vegetation as feasible possible on the project site.	**Consistent:** The Proposed Project would be subject to General Construction Permit, State WDRs (set forth in the local municipal stormwater permits), the Clean Water Act Sections 404/401 and California Fish and Wildlife Code Section 1602 requirements, including implementation of construction management (i.e., BMPs). site design and stormwater control and treatment measures (including LID measures where necessary) to control any pollutant discharges through the runoff and to minimize site runoff such that the post-project flows from the site must not exceed pre-project flows.
County of Monterey (coastal zone)	North County Land Use Plan	Land Use and Develop-ment	Tembladero Slough Diversion Coastal Alignment Option	**Key Policy 4.3.4**: All future development within the North County coastal segment must be clearly consistent with the protection of the area's significant human and cultural resources, agriculture, natural resources, and water quality.	**Consistent:** The Proposed Project would be implemented in conformance of State Construction General Permit and WDRs set forth in the local municipal code and stormwater permit. The WDR requirements would be incorporated into any new permits obtained prior to project operation, such as minimizing erosion and sediment control and runoff. The project's implications for cultural, agricultural, and terrestrial biological resources are discussed in EIR Sections 4.6, 4.12, and 4.5, respectively. Specifically, please refer to the policy consistency tables in those sections for additional discussion of the project's conformity with applicable North County Land Use Plan policies governing these resource areas, respectively.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Communit y Design and Develop-ment	RUWAP Alignment Option Coastal Alignment Option Booster Pump Station (RUWAP alignment)	***Policy 4.125:*** Approval of all future uses and construction within the Marina Planning Area shall be contingent upon compliance with the following policies and conditions intended to protect the quality of the area's water resources, avoid unnecessary consumption of water, and ensure that adequate water resources are available for new development.	**Consistent:** The Proposed Project would be constructed in conformance with the State Construction General Permit and WDRs, which require the implementation of specific construction-related BMPs to prevent concentrated stormwater run-on/runoff, soil erosion, and release of construction site contaminants. The Proposed Project would be operated in conformance with State WDRs under the NPDES Phase II Permit (Order No. 2013-001-DWQ, NPDES No. CAS000004), which regulates stormwater discharge into storm sewer systems. Please see Section 4.18 Water Supply and Wastewater for additional information on water use. The issue of groundwater levels is addressed further in Section 4.10 Hydrology and Water Quality: Groundwater. The project would not have adverse effects on groundwater levels such that mitigation would be required to ensure conformity with applicable plans, policies, and regulations adopted for the purpose of avoiding or mitigating an environmental effect.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Storm Drainage	RUWAP Alignment Option Coastal Alignment Option Booster Pump Station (RUWAP alignment)	***Policy 3.57 (1):*** All storm water runoff shall continue to be retained onsite and accommodated by localized retention basins. Retention basins associated with a particular project shall be landscaped with appropriate plant materials and shall be designed wherever possible as integral parts of a development project's common open space or parks, or to create new or enhance existing habitat. All onsite drainage facilities shall be designed to convey runoff from a 10-year frequency storm at minimum. In areas of the City where recycled water will not be readily available, the City encourages the provision of storm water reuse facilities of sufficient size to provide for landscape irrigation of development in proximity to retention basins. The adequacy of onsite and off-site drainage facilities shall be determined through the preparation of storm drainage reports and plans, approved by the City Public Works Director; such reports and plans shall be required for all new subdivisions and new commercial/industrial development proposed in Marina.	**Consistent:** The Proposed Project would be constructed and operated in conformance with the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-001-DWQ, NPDES No. CAS000004) which require the implementation of specific BMPs and measures to manage stormwater. The Proposed Project would be subject to MRSWMP, which requires stormwater control requirements under the MS4 permit and implementation of erosion and stormwater control measures. The State requirements are incorporated in the municipal stormwater permit. The proposed Product Water Conveyance pipeline (RUWAP and Coastal options) components within Marina would be buried below ground surface and not create new impervious surfaces that would increase uncontrolled stormwater runoff.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Storm Drainage	RUWAP Alignment Option Coastal Alignment Option Booster Pump Station (RUWAP alignment)	***Policy 3.57 (2):*** Pretreatment of stormwater runoff from roads, large parking areas, and other extensive paved areas used by vehicles shall be provided using appropriate means such as primary settlement structures, routing through settlement ponds, or routing through adequately long natural swales or slopes. In addition, all development plans shall conform to the requirements of the City's National Pollution Discharge Elimination System permit and City ordinances, and all subdivisions and new commercial/industrial development shall identify Best City of Marina General Plan 74 Management Practices (BMP's) appropriate or applicable to uses conducted onsite to effectively prevent the discharge of pollutants in stormwater runoff. 3. Stormwater systems shall be constructed in a manner which prevents soil erosion. Appropriate measures to avoid such impacts include the dispersal of runoff, installation of energy dissipaters where dispersal is not practical and concentration of runoff water is necessary, and retention of vegetation or revegetation of affected surfaces.	**Consistent:** The Proposed Project would be constructed and operated in conformance with the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-001-DWQ, NPDES No. CAS000004) which require the implementation of specific BMPs and measures to manage stormwater. The State requirements are incorporated in the municipal stormwater permit. The Proposed Project would be subject to the MRSWMP requirements under the MS4 permit and would be required to implement erosion and stormwater control measures. The Proposed Project components within Marina would be buried below the ground surface and would not create new impervious surfaces that would increase stormwater runoff.
City of Marina (coastal	Marina Municipal Code	Chapter 15.48 – Flood	RUWAP Alignment Option Coastal Alignment Option Booster Pump Station	***Chapter 15.48 - Flood Damage Prevention*** states provisions for flood prevention and reduction of flood hazards. A special flood hazard area is an area that is subject to one percent or greater change of flooding in a given year, which is the FEMA 100-year floodplain. The code also sets requirements for new storm drainage facilities.	**Consistent:** Within the city of Marina, portions of the Product Water Conveyance alignment would be constructed in a 100-year flood hazard area. However, except for the electrical control building and electrical control panel for the Booster Pump Station, the pipelines would be placed underground and would not

Table 4.11-12
Applicable Local Land Use Plans, Policies, and Regulations - Hydrology and Water Quality: Surface Water

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Policy or Program	Project Consistency with Policies and Programs
zone and inland areas)		Damage Prevention	(RUWAP alignment)		impede or redirect flood flows. The aboveground facilities would be built such that the sites would lie above the flood elevation levels and the site design would be such that the project facilities would not impede or redirect flood flows in that area.
City of Marina (coastal zone and inland areas)	Marina Municipal Code	Chapter 16.08 – Design Require-ment by Type of Subdivision	RUWAP Alignment Option Coastal Alignment Option Booster Pump Station (RUWAP alignment)	***Section 16.08.080 (F) Erosion Control.*** [Implement] silt basins, structures, planting or other forms of erosion control when necessary in the opinion of the Planning Commission.	**Consistent:** The Proposed Project would be constructed and operated in conformance with the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-001-DWQ, NPDES No. CAS000004) which require the implementation of specific BMPs and measures to manage stormwater. The State requirements are incorporated in the municipal stormwater permit. The Proposed Project would be subject to MRSWMP, which requires stormwater control requirements under the MS4 permit and implementation of erosion control measures.
City of Marina (coastal zone and inland area)	Marina Municipal Code	Title 8 - Health and Safety	RUWAP Alignment Option Coastal Alignment Option Booster Pump Station (RUWAP alignment)	***Section 8.46.130 Requirement to prevent, control, and reduce storm water pollutants (b) Responsibility to Implement Best Management Practices.*** Notwithstanding the presence or absence of BMP requirements promulgated pursuant to subparagraphs (a), (b), (c), and (d) of this section, each person engaged in activities or operations, or owning facilities or property which will or may result in pollutants entering storm water, the storm drain system, or waters of the U.S. shall implement best management practices to the extent they are technologically achievable to prevent and reduce such pollutants. The owner or operator of each commercial or industrial establishment shall provide reasonable protection from accidental discharge of prohibited materials or other wastes into the city storm drain system and/or watercourses. Facilities to prevent accidental discharge of prohibited materials or other wastes shall be provided and maintained at expense of the owner or operator.	**Consistent:** The Proposed Project would be constructed and operated in conformance with the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-001-DWQ, NPDES No. CAS000004) that require implementation of specific BMPs and measures to manage stormwater. The State requirements are incorporated in the municipal stormwater permit. The Proposed Project would be subject to MRSWMP, which requires stormwater control requirements under the MS4 permit and implementation of erosion and stormwater control measures to protect water quality.
City of Marina (coastal zone & inland area)	Marina Municipal Code	Title 8 - Health and Safety	RUWAP Alignment Option Coastal Alignment Option Booster Pump Station (RUWAP alignment)	***Section 8.46.130 Requirement to prevent, control, and reduce storm water pollutants (c) Construction Sites.*** The city's BMP Guidance Series will include appropriate best management practices to reduce pollutants in any storm water runoff from construction activities. The city shall incorporate such requirements in any land use entitlement and construction or building-related permit to be issued relative to such development or redevelopment. The owner and developer shall comply with the terms, provisions, and conditions of such land use entitlements and building permits as required in this chapter and the city storm water utility ordinance. Construction activities subject to BMP requirements shall continuously employ measures to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality, contamination, or unauthorized discharge of pollutants.	**Consistent:** The Proposed Project would be constructed and operated in conformance with the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-001-DWQ, NPDES No. CAS000004) that require implementation of specific BMPs and measures to manage stormwater. The Proposed Project would be subject to MRSWMP, which requires stormwater control requirements under the MS4 permit and implementation of erosion and stormwater control measures and to prevent concentrated stormwater run-on/runoff, soil erosion, and release of construction site contaminants to protect water quality.
City of Marina (coastal zone)	Marina Local Coastal Program Land Use Plan	Policy	RUWAP Alignment Option Coastal Alignment Option	**Policy 17.** To insure protection and restoration of ocean's water quality and biological productivity.	**Consistent:** The Proposed Project would be constructed and operated in conformance with the State Construction General Permit and WDRs (the NPDES Phase II Permit, Order No. 2013-001-DWQ, NPDES No. CAS000004), which require implementation of specific construction-related BMPs to prevent concentrated stormwater run-on/runoff, soil erosion, and release of construction site contaminants to protect water quality. The ocean discharges from the Proposed Project would meet Ocean Plan objectives.
Coastal Com-mission Original Jurisdiction	California Coastal Act	Marine Environ-ment	Treatment Facilities at the Regional Treatment Plant Transfer Pipeline Monterey Pipeline	***Section 30231: Biological Productivity; Water Quality.*** The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.	**Consistent:** The Proposed Project would be constructed and operated in conformance with the State Construction General Permit and WDRs (the NPDES Phase II Permit, Order No. 2013-001-DWQ, NPDES No. CAS000004 and Order No. R3-2014-0013, NPDES Permit No. CA0048551 for the Monterey Regional Water Pollution Control Agency Treatment Plant), which require implementation of BMPs and measures to prevent water pollution and control any pollutant discharge so as to protect water quality. The issue of aquatic biological productivity is addressed further in EIR Sections 4.13, Marine Biological Resources, and 4.6, Biological Resources: Terrestrial. The Proposed Project would meet Ocean Plan objectives at the edge of the zone of initial dilution as discussed further in Section 4.11.4, under Impact HS-5.
City of Monterey (coastal zone & inland area)	Monterey City Code	Chapter 31.5 - Storm Water Manage-ment	Monterey Pipeline Lake El Estero Diversion	***Section 31.5-12. Prohibitions of Illegal Discharges.*** No person or entity shall discharge or cause to be discharged into the municipal Storm Drain System or waters of the state, any materials, including but not limited to Pollutants or waters containing any Pollutants that cause or contribute to a violation of applicable water quality standards, other than storm water.	**Consistent:** The Proposed Project would be constructed and operated in conformance with the State Construction General Permit and the Chapter 31.5 of the City Code, which require the implementation of specific construction-related BMPs to prevent erosion and the release of contaminants to protect water quality.
City of Monterey (coastal zone & inland area)	Monterey City Code	Chapter 31.5 - Storm Water Manage-ment	Monterey Pipeline Lake El Estero Diversion	***Section 31.5-12. Requirement to Prevent, Control, and Reduce Storm Water Pollutants***. (c) Construction Sites. BMPs to reduce pollutants in any storm water runoff activities shall be incorporated in any land use entitlement and/or construction or building-related permit. The owner and developer shall comply with the terms, provisions, and conditions of such land use entitlements and/or building permits as required by the City and as required by the NPDES General Permit and as amended thereto.	**Consistent:** The Proposed Project would be constructed and operated in conformance with the State Construction General Permit and the Chapter 31.5 of the City Code, which require the implementation of specific construction-related BMPs to prevent erosion and the release of contaminants.
City of Monterey (coastal	Monterey Harbor Land Use Plan	Natural Marine Resource	Monterey Pipeline	***Policy 3.s.*** BMPs shall be incorporated into the project design in the following progression: ***Site Design BMPs*** (any project design feature that reduces the generation of pollutants or reduces the alteration of the natural drainage features, such as minimizing impervious surfaces or minimizing grading);	**Consistent:** The Monterey Pipeline would be located below ground and would not include new impervious surfaces that would affect stormwater quality or quantity. In addition, the Proposed Project would be subject to the State Construction General Permit and the Chapter 31.5 of the City Code, which require specific

Table 4.11-12
Applicable Local Land Use Plans, Policies, and Regulations - Hydrology and Water Quality: Surface Water

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Policy or Program	Project Consistency with Policies and Programs
zone)		and Habitat Areas		***Source Control BMPs*** (practices that prevent the release of pollutants into areas where they may be carried by runoff, such as covering work areas and trash receptacles, practicing good housekeeping, and minimizing the use of irrigation and gardening chemicals); ***Treatment Control BMPs*** (a system designed to remove pollutants from runoff including the use of gravity settling, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process).	construction-related BMPs to prevent stormwater pollutants from leaving the construction sites to protect water quality.
City of Monterey (coastal zone)	California Coastal Act	Marine Environment	Monterey Pipeline	***Section 30232: Oil and hazardous substance spills.*** Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.	**Consistent:** The Proposed Project would be constructed and operated in conformance with State Construction General Permit and WDRs which require implementation of measures to control and minimize any spills from chemicals such as oils that could be used or handled during construction or operations. See Section 4.9, Hazards and Hazardous Materials for more information.
City of Monterey (coastal zone and inland areas)	Monterey City Code	Chapter 31.5 – Storm Water Management	Monterey Pipeline and Lake El Estero Diversion	***Section 31.5-15 - Requirement to Prevent, Control, and Reduce Storm Water Pollutants. (b) New Development and Redevelopment.*** The City may require any owner or person developing real property to identify appropriate BMPs to control the volume, rate, and potential pollutant load of stormwater runoff from new development and redevelopment projects as may be appropriate to minimize the generation, transport and discharge of pollutants. The City shall incorporate such requirements in any land use entitlement and construction or building-related permit to be issued relative to such development or redevelopment. The owner and developer shall comply with the terms, provisions, and conditions of such land use entitlements and building permits as required in this Article and the City Stormwater Utility Ordinance, Chapter 31.5, Article 1. The requirements may also include a combination of structural and non-structural BMPs along with their long-term operation and maintenance.	**Consistent:** Within the city of Monterey, the Proposed Project would be constructed and operated in conformance with the State Construction General Permit and WDRs, which require implementation of BMPs and measures to prevent water pollution and control any pollutant discharge so as to protect water quality.
City of Monterey (coastal zone and inland areas)	Monterey City Code	Chapter 9 – Building Regulations	Monterey Pipeline and Lake El Estero Diversion	***Section 9-70.1- Establishment of Development Permit.*** A Development Permit shall be obtained before construction or development begins within any area of special flood hazards established in Section 9-69. Application for a Development Permit shall be made on forms furnished by the Floodplain Administrator and may include, but not be limited to plans prepared by a registered civil engineer in duplicate drawn to scale showing the nature, location, dimensions, and elevation of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities; along with their locations.	**Consistent:** No new habitable development or redevelopment is proposed within the city of Monterey. Portions of the Monterey Pipeline would be located in a 100-year flood zone. However, the pipeline would be located underground and would not subject people or property to flood hazards.
City of Monterey (coastal zone)	Del Monte Beach Coastal Land Use Plan	Local Coastal Program, Land Use Plan	Monterey Pipeline	***Policy 13:*** Any grading, excavation, or construction in conjunction with shoreline development, shall be conducted in a manner that will not impair biological productivity of the marine habitat.	**Consistent:** The Proposed Project would be constructed in conformance with the State Construction General Permit and WDRs (NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2014-0041]). See Sections 4.4, 4.5 and 4.13 for discussions of biological resources.
City of Monterey (coastal zone)	Del Monte Beach Coastal Land Use Plan	Local Coastal Program, Land Use Plan	Monterey Pipeline	***Policy 18:*** New development shall not result in the degradation of coastal waters caused by the introduction of pollutants or by changes to the landscape that adversely impact the quality, quantity, and flow dynamics of coastal waters. Runoff shall not be discharged in a manner that adversely impacts coastal waters.	**Consistent:** The Proposed Project would be constructed and operated in conformance with the State Construction General Permit and WDRs (NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2014-0041]), which require implementation of BMPs and measures to prevent water pollution and control any pollutant discharge so as to protect water quality.
City of Monterey (coastal zone)	Del Monte Beach Coastal Land Use Plan	Local Coastal Program, Land Use Plan	Monterey Pipeline	***Policy 19:*** BMPs shall be incorporated into the project design in the following progression: Site Design BMPs (any project design feature that reduces the generation of pollutants or reduces the alteration of the natural drainage features, such as minimizing impervious surfaces or minimizing grading); Source Control BMPs (practices that prevent release of pollutants into areas where they may be carried by runoff, such as covering work areas and trash receptacles, practicing good housekeeping, and minimizing use of irrigation and garden chemicals); Treatment Control BMPs (a system designed to remove pollutants from runoff including the use of gravity settling, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process). Site design and source control BMPs shall be included in all new developments. Where the development poses a threat to water quality due to its size, type of land use or proximity to coastal waters (or proximity to a creek, channel or storm drain system that leads to coastal waters) and the combination of site design and source control BMPs is not sufficient to protect water quality as required by Policy 18, treatment control BMPs shall be implemented. ***Policy 20:*** The City shall include a procedure in the Implementation Plan for reviewing all development for impacts to water quality to identify the potential water quality impacts from the development, and prescribe appropriate site design, source control or treatment control BMPs necessary to address those impacts. ***Policy 21:*** The implementation plan will include a manual of BMPs to guide project design and engineering for development within the Coastal Zone. ***Policy 22:*** Where post-construction treatment controls are required, BMPs shall be designed to infiltrate/treat the amount of stormwater runoff ; ***Policy 23:*** Under limited circumstances, where implementation of a treatment control BMP would typically be required to reduce the impacts of a development on water quality; ***Policy 24:*** The City or property owners where applicable shall be required to maintain any drainage device to ensure that it functions as designed and intended; ***Policy 25:*** Public streets and parking lots shall be swept frequently to remove debris and contaminant residue; and	**Consistent:** The Proposed Project would be constructed and operated in conformance with the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-001-DWQ, NPDES No. CAS000004 and Order No. R3-2014-0013), which require implementation of BMPs and measures to prevent water pollution and control any pollutant discharge so as to protect water quality. The State requirements are incorporated in the municipal stormwater permit. The Monterey Pipeline would be located underground and hence would have not pose a threat to water quality from new impervious surfaces.

Table 4.11-12
Applicable Local Land Use Plans, Policies, and Regulations - Hydrology and Water Quality: Surface Water

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Policy or Program	Project Consistency with Policies and Programs
				Policy 26: Control the buildup of plastic debris in the marine environment, the City shall require all new or improved development along the shoreline to install refuse and recycling containers at points conveniently accessible to commercial and recreational boaters, and the general public.	
City of Sand City (coastal zone)		Chapter 13.05 – Storm Water Manage-ment	Transfer Pipeline Monterey Pipeline	***Chapter 13.05 Storm Water Management.*** The chapter intends to protect and enhance water quality of water courses and water bodies by reducing pollutants in stormwater discharges to the maximum extent practicable and by prohibiting non-stormwater discharges to the storm drain system. The chapter applies to all water entering the storm drain system generated on any developed and undeveloped lands lying within the Sand City. For example, Section 13.05.060 prohibits non-stormwater discharges or any illegal discharges into municipal storm drain systems or water courses. Section 13.05.100 requires prevention, control, and reduction of stormwater pollutants, which apply to construction sites.	**Consistent:** The Proposed Project would be constructed in conformance with the State Construction General Permit and WDRs (NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2014-0041]), which require implementation of BMPs and measures to control and minimize stormwater runoff discharges.
City of Sand City (coastal zone)	Sand City Local Coastal Land Use Plan	4.Coastal Resource Manage-ment	Transfer Pipeline Monterey Pipeline	***Section 30253.*** New development shall minimize risks to life and property in areas of high geologic, flood, and fire hazard.	**Consistent:** Portions of the proposed pipelines in Sand City would be located in the 100-year coastal flood areas. However, no aboveground structures or new habitable developments are proposed that would subject life or property to high flood hazard.
City of Sand City (coastal zone)	Sand City Local Coastal Land Use Plan	4.Marine and Water Resources	Transfer Pipeline Monterey Pipeline	***Policy 4.3.29.*** Protect the water quality of the ocean. Source of pollution to coastal waters shall be controlled and minimized.	**Consistent:** The Proposed Project would be constructed in conformance with the State Construction General Permit and WDRs (NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2014-0041]), which require implementation of BMPs and measures to control and minimize stormwater runoff and wastewater discharges and protect water quality.
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Natural Hazards	Monterey Pipeline	***Coastal Act Section 30253 Minimization of adverse impacts:*** New development shall do all of the following: (a) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.	**Consistent:** The Monterey Pipeline would be constructed underground and would not impede nor redirect flood flows.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Conser-vation/ Open Space	RUWAP Alignment Option Coastal Alignment Option Booster Pump Station sites Injection Well Facilities Transfer Pipeline Monterey Pipeline	***Policy COS.3-2:*** Work with all local, regional, State, and federal agencies to implement mandated water quality programs and regulations to improve surface water quality. *Implementation Plan COS-3.2.1: NPDES Requirements:* To reduce pollutants in urban runoff, require new development projects and substantial rehabilitation projects to incorporate Best Management Practices (BMPs) pursuant to the National Pollutant Discharge Elimination System (NPDES) permit to ensure that the City complies with applicable state and federal regulations.	**Consistent:** The pipelines would be constructed below grade and would not increase the amount of impervious surfaces, or release pollutants. In addition, the Proposed Project would be subject to the State Construction General Permit, which requires the implementation of specific construction-related BMPs to prevent stormwater pollutants from leaving the construction sites.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Conser-vation/ Open Space	RUWAP Alignment Option Coastal Alignment Option Booster Pump Station sites Injection Well Facilities Transfer Pipeline Monterey Pipeline	***Policy COS-4.2*:** Protect and enhance the creeks, lakes, and adjacent wetlands for their value in providing visual amenity, habitat for wildlife, and recreational opportunities.	**Consistent:** The Proposed Project would be constructed and operated in conformance with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-001-DWQ),which require implementation of BMPs and measures to control and minimize any stormwater runoff and prevent water pollution so as to protect water quality. The Proposed Project would be operated in conformance with State WDRs under the NPDES Phase II Permit (Order No. 2013-001-DWQ, NPDES No. CAS000004), which regulates stormwater discharge into storm sewer systems. For impacts related to wetlands, please refer to Section 4.5, Biological Resources: Terrestrial.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Safety	RUWAP Alignment Option Coastal Alignment Option Booster Pump Station sites) Injection Well Facilities Transfer Pipeline Monterey Pipeline	***Policy S-1.2*:** Protect the community from flooding hazards. *Implementation Plan S-1.2.1*: Project Flood Control. Require developers to provide flood control systems in new development areas that mitigate potential on-site flooding hazards and also avoid increasing flood hazards elsewhere.	**Consistent:** None of the Proposed Project components proposed for Seaside would be located in a flood hazard area. With the exception of the Injection Well Facilities and the Coastal Booster Pump Station Proposed Project components proposed for Seaside would be buried below ground surface and would not present a risk of flood hazard. The Injection Well Facilities and Coastal Booster Pump Station Site would not be located in a flood hazard area and would be subject to the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-001-DWQ) set forth in the local municipal stormwater permit, which include requirements to control and minimize stormwater runoff so as to prevent any flood hazards and impede flood flows.
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 8.46: Urban Storm Water Quality Manage-ment & Discharge Control	RUWAP Alignment Option Coastal Alignment Option Booster Pump Station sites Injection Well Facilities Transfer Pipeline Monterey Pipeline	***Chapter 8.46 Urban Storm Water Quality Manage Surface Management and Discharge Control.*** Urban Stormwater Quality Management and Discharge Control would apply to all water entering the storm drain system generated on any developed and undeveloped lands lying within the city. The chapter lists requirements to prevent, control, and reduce stormwater pollutants, protection of water courses, and notification to emergency response officials in the event of a chemical release.	**Consistent:** The Proposed Project would be constructed and operated in conformance with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-001-DWQ, NPDES No. CAS000004 and Order No. R3-2014-0013), which require implementation of BMPs and measures to control and minimize stormwater discharges into nearby water bodies. The State requirements are incorporated in the local municipal code and the municipal stormwater permit.

Table 4.11-12
Applicable Local Land Use Plans, Policies, and Regulations - Hydrology and Water Quality: Surface Water

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Policy or Program	Project Consistency with Policies and Programs
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 8.46: Health and Safety	RUWAP Alignment Option Coastal Alignment Option Booster Pump Station (Coastal) Injection Well Facilities Transfer Pipeline Monterey Pipeline	***Section 8.46.130 Requirement to prevent, control, and reduce storm water pollutants (B) Responsibility to Implement Best Management Practices***. Notwithstanding the presence or absence of BMP requirements promulgated pursuant to subparagraphs A, B, C, and D of this section, each person engaged in activities or operations, or owning facilities or property which will or may result in pollutants entering storm water, the storm drain system, or waters of the U.S. shall implement best management practices to the extent they are technologically achievable to prevent and reduce such pollutants. The owner or operator of each commercial or industrial establishment shall provide reasonable protection from accidental discharge of prohibited materials or other wastes into the city storm drain system and/or watercourses. Facilities to prevent accidental discharge of prohibited materials or other wastes shall be provided and maintained at expense of the owner or operator. ***Section 8.46.130 Requirement to prevent, control, and reduce storm water pollutants (C) Construction Sites***. The city's BMP Guidance Series will include appropriate best management practices to reduce pollutants in any storm water runoff from construction activities. The city shall incorporate such requirements in any land use entitlement and construction or building-related permit to be issued relative to such development or redevelopment. The owner and developer shall comply with the terms, provisions, and conditions of such land use entitlements and building permits as required in this chapter and the city storm water utility ordinance. Construction activities subject to BMP requirements shall continuously employ measures to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality, contamination, or unauthorized discharge of pollutants.	**Consistent:** The pipelines would be constructed below grade and would not increase the amount of impervious surfaces, or releasing pollutants. In addition, the Proposed Project would be subject to the State Construction General Permit, and the Seaside Municipal Code, which require the implementation of specific construction-related BMPs to prevent stormwater pollutants from leaving the construction sites.
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Coastal Zone	Monterey Pipeline	**Policy NCR-CZ 1.3.B: Protection of Wetlands** III. The biological productivity of coastal waters, streams, wetlands, estuaries, and lakes, shall be maintained and restored, where feasible, to maintain optimum populations of marine organisms and to protect human health where applicable. Maintenance and restoration efforts shall support biological productivity by minimizing adverse effects of wastewater discharges and entrainment; controlling runoff, preventing substantial interference with surface water flow, and minimizing alteration of natural streams; preventing depletion of groundwater supplies; encouraging wastewater reclamation; and maintaining natural vegetation buffer areas that protect riparian habitats.	**Consistent:** The Proposed Project would be constructed and operated in conformance with the State Construction General Permit and WDRs, which require implementation of BMPs and measures to prevent water pollution and control any pollutant discharge so as to protect water quality. The issue of wetlands protection is addressed further in EIR Section 4.6, Biological Resources. As discussed in Impact 4.6-11, wetlands resource issues would be addressed through implementation of recommended mitigation measures, thereby resolving potential conflicts with applicable biological resources protection policies.
City of Seaside	Fort Ord Reuse Authority Base Reuse Plan	Conser-vation	RUWAP Alignment Option Coastal Alignment Option Booster Pump Station (Coastal) Injection Well Facilities Transfer Pipeline Monterey Pipeline	**Hydrology and Water Quality Policy A-1:** At the project approval stage, the City shall require new development to demonstrate that all measures will be taken to ensure that runoff is minimized and infiltration maximized in groundwater recharge areas.	**Consistent:** The Proposed Project would be constructed and operated in conformance with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-001-DWQ), which require implementation of BMPs and measures to control and minimize impervious surfaces and any stormwater runoff.
City of Seaside	Fort Ord Reuse Authority Base Reuse Plan	Conser-vation	RUWAP Alignment Option Coastal Alignment Option Booster Pump Station (Coastal) Injection Well Facilities	**Hydrology and Water Quality Policy C-2:** At the project approval stage, the City shall require new development to demonstrate that all measures will be taken to ensure that on-site drainage systems are designed to capture and filter out urban pollution.	**Consistent:** The Proposed Project would be constructed and operated in conformance with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-001-DWQ), which require implementation of BMPs and measures to control and minimize impervious surfaces and any stormwater runoff.

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4.11.4 Impacts and Mitigation Measures

4.11.4.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, the project would have a significant impact on surface water hydrology and water quality if it would:

a. Violate any water quality standards or waste discharge requirements.

b. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site.

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.

d. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

e. Otherwise substantially degrade water quality.

f. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other authoritative flood hazard delineation map.

g. Place within a 100-year flood hazard area structures that would impede or redirect flood flows.

h. Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam, or as a result of sea level rise and storm surges.

i. Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow.

4.11.4.2 Impact Analysis Overview

Approach to Analysis

Construction

Proposed Project construction could impact surface water hydrology and water quality of regional and local surface waters and the ocean. The surface water hydrology and water quality analysis evaluates whether the Proposed Project construction activities would have the potential to degrade existing water quality, increase erosion, modify drainage patterns, or exceed capacities of existing drainage facilities.

The analyses related to Criteria “a,” “b,” “d”, and “e” are based on existing site conditions, applicable water quality requirements of relevant regulatory programs, including required permits, and local ordinances. Construction dewatering and erosion was analyzed for the Proposed Project by Ninyo and Moore in their project-specific Draft Preliminary Geotechnical Analysis (see **Appendix K**). Regional data, plans, reports, and maps were reviewed to identify surface water resources that could be directly or indirectly affected by Proposed Project construction. The impact analysis describes if and to what degree the Proposed Project construction would change the existing surface water hydrology and water quality, conditions described in **Section 4.11.2** and how the Proposed Project would comply with or exceed any regulatory requirements described in **Section 4.11.3**. The significance of an impact is determined using the criteria identified in **Section 4.11.4.1**. No construction activities are proposed within the marine study area. No direct construction impacts to marine resources would occur because none of the Proposed Project components involve construction within the marine study area defined above. Indirect temporary construction impacts on the marine water quality relative to discharges to surface waters that may lead to the ocean are also addressed.

Criteria “c” “f,” “g,” “h,” and “i” are not evaluated for construction-related impacts, because the temporary activities would not result in substantial risks related to any types of flooding nor inundation. Construction crews and equipment would demobilize in the unlikely event of one of these conditions occurring during the short-term construction periods for each component (see **Figure 2-40**). These criteria are not discussed in **Section 4.11.4.3**.

Operation

Operational or long-term impacts on inland surface water bodies and the marine water quality relative to flow quantities and water quality may occur due to siting of some project components, operational diversions of source water, discharges to surface waters and the ocean, and maintenance activities. The impact analysis describes if and to what degree the Proposed Project operations would change the existing hydrology, water quality, and flooding conditions described in **Section 4.11.2** and how the Proposed Project would comply with or exceed any regulatory requirements described in **Section 4.11.3**. The significance of an impact is determined using the criteria identified in **Section 4.11.4.1**.

Operational impacts on the hydrology and water quality of inland surface water bodies due to the proposed source water diversions to the wastewater treatment system are analyzed based on the results of the following technical reports:

- *Salinas River Inflow Impacts* (Schaaf & Wheeler, 2015a) [**Appendix O**]
- *Memorandum: Impacts of Changes in Percolation at the Salinas Industrial Wastewater Treatment Facility on Groundwater and the Salinas River* (Todd Groundwater, 2015a) [**Appendix N**]
- *Reclamation Ditch Yield Study* (Schaaf & Wheeler, 2015b) [**Appendix P**]
- *Blanco Drain Yield Study* (Schaaf & Wheeler, 2014b) [**Appendix Q**]
- *Urban Runoff Capture at Lake El Estero* (Schaaf & Wheeler, 2014a) [**Appendix R**]

To analyze sea level rise, storm surges, and their effects on coastal erosion and flooding, ESA/PWA prepared an analysis regarding storm surges and sea level rise that is the basis of the impact analysis in this issue area (ESA/PWA, 2014). In addition to the studies identified above, the project-specific Preliminary Geotechnical Evaluation (Ninyo and Moore, 2014) addresses operational impacts related to coastal inundation and flooding of facilities (see **Appendix K**).

The impact analysis in this section on marine water quality describes if, and to what degree, the Proposed Project would change the existing ocean water quality described in **Section 4.11.2** and how the Proposed Project would comply, or be consistent, with the regulatory requirements described in **Section 4.11.3**. The significance of an impact is determined using the criteria identified in **Section 4.11.4.1**.

Potential adverse impacts to marine water quality considered below are those that would result from operation of the Proposed Project Advanced Water Treatment Facility (AWT Facility), specifically discharges of reverse osmosis concentrate to Monterey Bay through the existing ocean outfall.

The discharge of reverse osmosis concentrate would not involve high salinities because the concentrate would be far less saline than ambient ocean water (5,800 mg/L of TDS compared to 33,000 to 34,000 mg/L). In addition, the reverse osmosis concentrate discharge would not result in a negatively buoyant (or sinking) plume.

Modeling of the dilution characteristics of the Proposed Project ocean discharge from the outfall to the edge of the ZID (i.e., the zone of initial dilution) was conducted by FlowScience, Inc. to determine minimum initial dilution values for the various discharge scenarios. The ocean modeling results were used to assess compliance with the Ocean Plan. The information sources included the results of source water assessments, GWR pilot plant and water quality sampling, and monitoring, ocean dilution modeling by FlowScience (November, 2014), provided in **Appendix T** and water quality quantitative analysis of the Proposed Project's ability to meet the Ocean Plan objectives by Trussell Technologies (2015a and c) provided in **Appendix U-1 and U-2**, and described in detail in below.[10]

Areas of No Impact

The Proposed Project would not result in impacts related to some of the significance criteria, as explained below. Impact analyses related to the other criteria are addressed below under **subsections 4.7.4.4** (construction impacts), **4.7.4.5** (operational impacts), and **4.7.4.6** (cumulative impacts).

> *Place housing within a 100-year flood hazard area (criterion "f").* The Proposed Project does not include the construction of new housing or structures for human occupancy. Therefore, the significance criterion related to the placement of housing within a 100-year flood hazard zone is not applicable to the Proposed Project and is not discussed further.

Summary of Impacts

Table 4.11-13 (Summary of Impacts – Hydrology and Water Quality: Surface Water) provides a summary of potential impacts to the surface water hydrology and water quality environment and significance determinations at each Proposed Project component site.

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[10] In addition to the water quality analysis of Ocean Plan Table 1 and 2 constituents by Trussell Technologies, MRWPCA conducted a toxicity test on reverse osmosis concentrate produced during the pilot plant program for the Proposed Project and the results are summarized in this section.

Table 4.11-13
Summary of Impacts –Hydrology and Water Quality: Surface Water

Impact Title	Source Water Diversion and Storage Sites						Treatment Facilities at Regional Treatment Plant	Product Water Conveyance		Injection Well Facilities	CalAm Distribution System		Project Overall
	Salinas Pump Station	Salinas Treatment Facility Storage and Recovery	Reclamation Ditch	Tembladero Slough	Blanco Drain Diversion (Pump Station and Pipeline)	Lake El Estero		RUWAP Alignment Option	Coastal Alignment Option		Transfer Pipeline	Monterey Pipeline	
HS-1: Construction Impacts to Surface Water Quality due to Discharges	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	**LS**
HS-2: Construction Impacts to Surface Water Quality due to Earthmoving, Drainage Alterations, and Use of Hazardous Chemicals	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	**LS**
HS-3: Operational Impacts to Surface Water Quality due to Well Maintenance Discharges	NI	NI	NI	NI	NI	NI	NI	NI	NI	LS	NI	NI	**LS**
HS-4: Operational Surface Water Quality Impacts due to Source Water Diversions	LS	LS	LSM	LS	LS	LS	NI	NI	NI	NI	NI	NI	**LSM**
HS-5: Operational Marine Water Quality due to Ocean Discharges	BI	BI	BI	BI	BI	BI	LS	NI	NI	NI	NI	NI	**LS**
HS-6: Operational Drainage Pattern Alterations	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	**LS**
HS-7: Operational Carmel River Flows	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	**BI**
HS-8: Operational Risks due to Location within 100-Year Flood Area	LS	LS	LS	LS	LS	LS	NI	LS	LS	LS	NI	NI	**LS**
HS-9: Operational Risks due to Flooding due to Levee/Dam Failure, or Coastal Inundation	LS	LS	NI	LS	LS	LS	NI	NI	NI	NI	LS	LS	**LS**
HS-10: Operational Seiche, Tsunami, or Mudflow Risk	NI	NI	NI	LS	LS	LS	NI	NI	NI	NI	LS	LS	**LS**
Cumulative Impacts- Inland	LS: There would be no significant construction or operational cumulative impacts to hydrology or water quality of inland surface waters.												
Cumulative Impacts- Marine	LSM: The Proposed Project would potentially make a considerable contribution to significant cumulative impacts to marine water quality due to the potential exceedance of the Ocean Plan water quality objectives for several constituents; however, with implementation of Mitigation Measure HS-C, the impact would be reduced to less than significant and the proposed Project would not make a considerable contribution to a significant cumulative impact.												

NI – No Impact
LS – Less than Significant
LSM – Less than Significant with Mitigation
SU – Significant Unavoidable
BI – Beneficial Impact

4.11.4.3 Construction Impacts and Mitigation Measures

Impact HS-1: <u>Construction Impacts to Surface Water Quality due to Discharges</u>. Proposed Project construction involving well drilling and development, and dewatering of shallow groundwater during excavation would generate water

requiring disposal. Compliance with existing regulatory requirements would ensure that water disposal during construction would not violate any water quality standards or waste discharge requirements, would not cause substantial erosion or siltation, and would not otherwise substantially degrade surface water quality. (Criteria a, b, d, and e) (Less than Significant)

Injection Well Facilities

As described in **Chapter 2, Project Description**, the deep injection wells 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). The direct rotary drilling method would also likely be used for the monitoring wells.

When necessary and depending on the formation material encountered, certain commercially available additives could be combined with the drilling water to increase fluid viscosity and stabilize the walls of the boring to prevent reactive shale and clay from swelling and caving into the hole. Other products used to enhance the drilling performance help reduce the build-up of solids, decrease friction, and aid in reducing solids suspension. Drilling mud additives would be used for the drilling and installation of groundwater wells. Because the additives are combined with the water and are circulated through the borehole annulus during drilling, they react locally within the borehole and do not migrate into the surrounding groundwater formation. The additives are noncorrosive, biodegradable and do not contain chemicals that would contaminate the groundwater supply. The muds and clay slurry generated during the drilling and development of the Proposed Project's injection wells would fall under the category of "Water Supply Well Drilling Muds" in the *General Waiver of Waste Discharge Requirements for Specific Types of Discharges* (General Waiver) that is discussed in **Section 4.11.3.1**, above (RWQCB, 2014a).

The water extracted during well development falls under the category of "water supply discharges" in the General Waiver. Therefore, Proposed Project water supply discharges during construction that would occur under the General Waiver include all water produced during well drilling and development. Under the General Waiver, these discharges would be waived from waste discharge requirements and from the requirement of submitting a waste discharge report; however, they would be subject to the following conditions (RWQCB, 2014a):

Water Supply Well Drilling Muds

- The discharge shall be spread over an undisturbed, vegetated area capable of absorbing the top-hole water and filtering solids in the discharge, and spread in a manner that prevents a direct discharge to surface waters.
- The pH of the discharge shall be between 6.5 and 8.3.
- The discharge shall not contain oil or grease.
- The discharge area shall not be within 100 feet of a stream, body of water, or wetland, nor within streamside riparian corridors.

Water Supply Discharges

- The discharger shall implement appropriate management practices to dissipate energy and prevent erosion.

- The discharger shall implement appropriate management practices to preclude discharge to surface waters and surface water drainage courses.
- The discharger shall immediately notify the Central Coast RWQCB staff of any discharge to surface waters or surface water drainage courses. The discharge shall not have chlorine or bromine concentrations that could impact groundwater quality.
- The discharge area shall not be located within 100 feet of a stream, body of water, or wetland.

Because the disposal of water produced during well drilling and development activities would comply with the conditions of the General Waiver and those conditions have been documented to be effective at preventing significant water quality impacts from occurring, the Proposed Project construction activities requiring water disposal during well drilling and development would have a less-than-significant impact and no mitigation is necessary.

All Proposed Project Components Requiring Excavation and Dewatering

Subsurface water levels vary throughout the project area and depths of excavation would vary by Proposed Project component. Excavation during construction of all Proposed Project components may intercept shallow or perched groundwater, requiring temporary localized dewatering to facilitate construction. Groundwater encountered during excavation would be pumped and discharged to the local drainage system. Water from dewatering operations could contain materials used during typical construction activities such as silt, fuel, grease or other chemicals. Absent regulatory controls, the discharge from construction dewatering could thus contaminate downstream surface water.

The northern project area includes the Source Water Diversion and Storage sites (except the Lake El Estero Diversion site in Monterey), including the following: Salinas Pump Station Diversion site, the Salinas Treatment Facility Storage and Recovery site, Reclamation Ditch Diversion site, Tembladero Slough Diversion site, and Blanco Drain Diversion site. These components are located in low-lying floodplain areas within this area are underlain by Holocene alluvial deposits. These deposits include unconsolidated interbedded silts, clays, sands, and gravels. Groundwater is anticipated to be approximately ten feet deep or less in low-lying areas, such as the Salinas Pump Station and pipelines associated with the Source Water Storage and Diversion components. Within the perennially wet urban and agricultural land drainage channels (Reclamation Ditch, Tembladero Slough, and Blanco Drain), the surficial soils will be saturateda and surface water would be present. In these situations, subsurface drainage conditions are relatively poor and the subsurface soils are anticipated to be very moist to saturated. Trench excavations may encounter groundwater, moist to wet soils, and soft ground conditions, and trench dewatering may be required. Moist to wet soil conditions along lower elevations may require drying/mixing prior to trench backfill compaction. Soft ground may require over-excavation and stabilization with crushed rock/filter fabric to provide suitable pipe bedding support. (Ninyo & Moore, 2014)

Construction work occurring within drainage channels at the Source Water Storage and Diversion (i.e., the perennially wet urban and agricultural land drainage channels, including Reclamation Ditch, Tembladero Slough, and Blanco Drain) would disturb approximately 0.15 to

0.25 acres of land at each site, including the banks and channel bottoms.[11] The channels carry 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. Permits would be required prior to commending construction including as required by the Clean Water Act Sections 404 and 401), and California Fish and Wildlife Code 1602 (Streambed Alteration Agreements) that required management measures to protect downstream water quality and biological habitat and species.

The southwestern portion of the study area includes the sites for the proposed CalAm Distribution System: Monterey and Transfer pipelines, and the Lake El Estero Diversion site. Trench excavations in the low-lying alluvial areas may encounter some soft, wet, alluvium with a potential for caving and unstable trench bottoms. Dewatering may be required. (Ninyo & Moore, 2014)

Most of the dewatering effluent produced during construction and excavation is considered a low threat and can be discharged to the land or local receiving water provided it complies with the *General Waste Discharge Requirements for Discharges with a Low Threat to Water Quality* (Order No. R3-2011-0223, NPDES Permit No. CAG993001) (RWQCB, 2011c). To comply with the conditions of these general waste discharge requirements, the construction contractor(s) would be required to control, test, and treat the extracted water as needed to minimize or avoid water quality degradation, erosion, and sedimentation in the receiving waters. To receive coverage under the general waste discharge requirements, the contractor would submit a Notice of Intent along with the following materials to the Central Coast RWQCB (2011c):

- A list of all chemicals (including Material Safety Data Sheets) added to the water and the concentrations of such additives in the discharged effluent;
- Certified analytical results of the effluent for all priority toxic pollutants listed in Attachment D of the General Waste Discharge Requirements. These analyses would fulfill the requirements set forth in the California Toxics Rule to evaluate the potential for water quality degradation and establish effluent limits, unless the discharge meets all requirements for a conditional exception;
- Certified analytical results of representative samples of the receiving surface water collected 50 feet upstream and 50 feet downstream from the point of discharge, respectively. Alternately, if access is limited, the samples can be collected at the first point upstream and downstream of the discharge, respectively, that is accessible for the following constituents: pH, temperature, color, turbidity, and dissolved oxygen;
- For low-threat discharges from proposed facilities, the Contractor(s) would provide analytical data for discharges from similar existing facilities, or information regarding

[11] **Section 4.4, Biological Resources: Fisheries** includes the following mitigation measure (as an alternative to compliance with recommended fish bypass flow requirements in Mitigation Measures BF-2a): "**Mitigation Measure Alternate BF-2b: Modify San Jon Weir. (Applies to the Reclamation Ditch Diversion).** Construct modifications to the existing San Jon weir to provide for steelhead passage. Modifications could include downstream pool, modifications to the structural configuration of the weir to allow passage or other construction and improvements to remove the impediment to steelhead passage defined above." If this alternate mitigation measure is implemented, these measures would also result in "in channel" construction activities with the same mandatory permits and regulatory requirements that would reduce insure potential impacts would remain less-than-significant.

the anticipated discharge characteristics of the proposed facility based on the specific facility design. As part of facility startup, the operator of each facility would submit all analytical results required in Section A of the General Waste Discharge Requirements; and

- If the concentration of any constituent in the effluent sampled under the second bullet above exceeds the applicable criterion listed in Attachment D of the General Waste Discharge Requirements, the Contractor(s) may submit a Reasonable Potential Analysis consistent with Section 1.3 of the State Implementation Policy or Appendix VI of the Ocean Plan, as applicable.

In certain cases, depending on the site-specific conditions and the construction methods, suspended sediment and/or trace amounts of construction-related chemicals (i.e., fuels, lubricants, cement products) could be present in the dewatering effluent. The dewatering effluent could also contain other chemicals and contaminants present in local soil and groundwater. If the dewatering effluent contains contaminants that do not comply with the requirements of the General Waste Discharge Requirements, the contractor must contain the dewatering effluent in a portable holding tank for appropriate offsite disposal or discharge. The contractor could either dispose of the effluent at a permitted waste management facility or discharge the dewatering effluent, under permit, to a publicly owned treatment works such as the MRWPCA Regional Treatment Plant.

Adherence to the permit requirements as described above would ensure that the Proposed Project would not have a significant impact on water quality due to construction dewatering and therefore, no mitigation measures would be required.

Impact Conclusion

All water extracted during well drilling and development of the Injection Well Facilities would be disposed of in accordance with the *General Waiver of Waste Discharge Requirements for Specific Types of Discharges* (Resolution R3-2014-0041). Disposal of water produced during general construction dewatering would be conducted in accordance with the *NPDES General Permit for Discharges with Low Threat to Water Quality* (Central Coast RWQCB Order R3-2011-0223). All discharges of water produced during well drilling and development, and dewatering of shallow groundwater during construction would occur in compliance with these regulatory requirements that are protective of the receiving water quality. Therefore, the Proposed Project construction would result in less-than-significant water quality impacts due to well drilling and development, and dewatering of surface waters and shallow groundwater during excavation for all Proposed Project components and for the project as a whole and no mitigation measures would be required.

Impact HS-2: Construction Impacts to Surface Water Quality due to Earthmoving, Drainage Alterations, and Use of Hazardous Chemicals. Proposed Project construction would not violate any water quality standards or waste discharge requirements, would not cause substantial erosion or siltation, and would not otherwise substantially degrade surface water quality including marine water quality, due to earthmoving, drainage system alterations, and use of hazardous chemicals. (Criteria a, b, d, and e) (Less than Significant)

All Project Components

The Proposed Project could degrade water quality as a result of erosion and siltation caused by earthmoving activities during construction or the accidental release of hazardous construction chemicals. In general, water quality impacts would be significant if a water quality standard were to be exceeded or a beneficial use were to be impacted due to changes in water quality caused by erosion and/or siltation or release of hazardous construction chemicals resulting from Proposed Project earthmoving activities.

Earthmoving activities associated with Proposed Project construction at all sites would temporarily alter existing drainage patterns to some degree, including grading, excavation, and soil stockpiling. New pipelines would generally be installed using open-trench construction methods. Exposed soil from excavated areas, stockpiles, and other areas where ground cover would be removed could be inadvertently transported offsite by wind or water. If not properly managed, this could increase sediment loads in surface water bodies some of which are located on site (as in the Reclamation Ditch, Tembladero Slough, and Blanco Drain source water diversion sites) and adversely impact the surface water quality, including quality of marine waters, thereby adversely affecting water quality and designated beneficial uses.

Construction activities at all sites could also result in the accidental release of hazardous construction chemicals, such as adhesives, solvents, lubricants, and fuels. If not managed appropriately, these chemicals could adhere to soil particles, become mobilized by rain or runoff, and flow to downstream water bodies, including sloughs, ditches, and drains that lead to the Salinas River and Monterey Bay/Pacific Ocean, degrading water quality.

Proposed Project construction activities would disturb more than one acre of soil, therefore all Proposed Project components would be subject to the NPDES Construction General Permit and the Municipal Stormwater Permit requirements. As required under the Construction General Permit a Stormwater Pollution Prevention Plan (SWPPP) would be prepared by a Qualified SWPPP Developer and a Qualified SWPPP Practitioner would oversee its implementation. The SWPPP, which would include specific measures and conditions to reduce or eliminate stormwater flow carrying any pollutants or sediment from the earthmoving activities and related construction activities, would be implemented throughout the duration of construction activities. As discussed in **Section 4.11.3, Regulatory Framework**, the SWPPP is required to include specific elements such as erosion and stormwater control measures that would be implemented onsite. At a minimum, the SWPPP must include the following:

- A description of construction materials, practices, and equipment storage maintenance;
- A list of pollutants likely to contact stormwater and site specific erosion and sedimentation control practices;
- A list of provisions to eliminate or reduce discharge of materials to stormwater;

- BMPs for fuel and equipment storage;
- Non-stormwater management measures to manage pollutants generated by activities such as paving operations and vehicle and equipment washing and fueling;
- The requirement that the appropriate equipment, materials, and workers be available to respond rapidly to spills and/or emergencies. All corrective maintenance or BMPs must be performed as soon as possible, depending upon worker safety; and
- On-site post-construction controls.

Examples of typical construction BMPs include scheduling or limiting certain activities to dry periods of the year, installing sediment barriers such as silt fencing and fiber rolls, maintaining equipment and vehicles used for construction, and tracking controls such as stabilization of construction access points. The development and implementation of BMPs such as overflow structures designed to capture and contain any materials that are inadvertently released from the storage containers on the construction site is also required. In accordance with the Construction General Permit, a Rain Event Action Plan would be required to ensure that active construction sites have adequate erosion and sediment controls in place prior to the onset of a storm event, even if construction is planned only during the dry season.

The construction contractor(s) would also be required to develop and implement a monitoring program as required under the NPDES Construction General Permit. The contractor would be required to conduct inspections of the construction site prior to anticipated storm events and after the actual storm events. During extended storm events, the inspections would be conducted after every 24-hour period. The inspections would be conducted to: identify areas contributing to stormwater discharge; evaluate whether measures to reduce pollutant loadings identified in the SWPPP are adequate, were properly installed, and are functioning in accordance with the Construction General Permit; and determine whether additional control practices or corrective measures are needed. Mandatory compliance with the NPDES Construction General Permit requirements would prevent significant construction-related impacts to surface water quality during general construction activities. Therefore, the water quality impacts (including on inland surface waters and marine waters) associated with general construction activities would be less than significant.

Impact Conclusion

Prior to construction of any of the Proposed Project components, compliance with NPDES Construction General Permit would be required, including implementation of erosion and stormwater quality control measures set forth in a SWPPP and a Rain Event Action Plan that would prevent substantial adverse effects on water quality during construction. The Proposed Project would have a less-than-significant impact on water quality associated with increased soil erosion and sedimentation, and inadvertent releases of toxic chemicals during general construction activities and no mitigation measures would be required.

4.11.4.4 Operational Impacts and Mitigation Measures

Impact HS-3: Operational Impacts to Surface Water Quality due to Well Maintenance Discharges. Proposed Project operations would not violate any water quality standards or waste discharge requirements, would not cause substantial erosion or siltation, and would not otherwise substantially degrade surface water quality due to well maintenance discharges. (Criteria a, b, d, and e) (Less Than Significant)

Injection Well 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 regain lost capacity, wells are 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, so as not to impact the geologic formation in the vicinity of the well.

Based on the experience of the Water Management District in the operation of its nearby Aquifer Storage and Recovery wells, back-flushing of each GWR injection well would occur for about four hours weekly and would require discharge of the back-flush water to the on-site proposed percolation pond, or back-flush basin (see **Figure 2-33** in **Section 2, Project Description**).

All discharge water would be comprised only of water extracted from the Santa Margarita groundwater aquifer, an aquifer whose water quality consistently meets drinking water quality standards, as discussed in **Section 4.10, Hydrology and Water Quality: Groundwater**. There are no surface water bodies nor wetlands or riparian areas within the Injection Well Facilities site and the site contains soils that are sandy and drain quickly; therefore, the discharge water associated with well maintenance discharge would not violate any water quality standards or waste discharge requirements, and would not otherwise substantially degrade surface water quality. The back-flush basin would be constructed to ensure that water discharges to an area reinforced by rock rip rap to dissipate the energy and therefore, would not cause substantial erosion or siltation. The Proposed Project would have a less-than-significant impact due to discharge of well maintenance water, and no mitigation measures would be required.

None of the other Proposed Project components include the construction of wells nor would the other components involve any well maintenance discharges to land or inland surface waters. Marine water quality impacts due to operational discharges of wastewater (reverse osmosis concentrate) from the AWT Facility to the Monterey Bay are addressed in **Impact HS-5, below**. Therefore, the Proposed Project would have a less-than-significant impact on surface water quality due to well maintenance discharges and no mitigation measures would be required.

Impact Conclusion

There are no surface water bodies nor wetlands or riparian areas within the Injection Well Facilities site and the site contains soils that are sandy and drain quickly; therefore, the discharge water associated with well maintenance discharge would not violate any water quality standards or waste discharge requirements, and would not otherwise substantially degrade surface water quality. None of the other Proposed Project components include the construction of wells nor would the other components involve any well maintenance discharges to land or inland surface waters. The Proposed Project would have a less-than-significant impact due to discharge of well maintenance water, and no mitigation measures would be required.

Impact HS-4: Operational Surface Water Quality Impacts due to Source Water Diversions. Proposed Project diversions would result in water quality benefits due to diversion and treatment of polluted waters; however, rapid water fluctuation from diversions at the Reclamation Ditch could induce erosion and sedimentation in downstream waters. (Criteria a, b, d, and e) (Less than Significant with Mitigation)

Source Water Diversion and Storage Sites

This section provides a detailed description of pollutant load reduction benefits on surface waters due to diversion of the various source waters to the Regional Treatment Plant for treatment and reuse. The Proposed Project would reduce the disposal of certain polluted waters to the environment, including to groundwater, surface waters, and in most cases, to the Monterey Bay portion of the Pacific Ocean. In addition, this section analyzes other potential operational impacts on surface water quality related to the Source Water Diversion and Storage Sites, such as erosion and sedimentation/siltation, and salinity changes in surface water bodies.

Proposed new source waters to be treated and reused include: excess municipal wastewater, agricultural wash water, southern Salinas urban runoff that currently flows to Salinas River, Reclamation Ditch water, Tembladero Slough water, Blanco Drain water, and Lake El Estero water. Each of the proposed new source waters contain varying amounts and concentrations of pollutants as characterized in **Sections 4.10 Hydrology and Water Quality: Groundwater** and in **Section 4.11.2.3, above**. **Section 4.10.2.3** also summarizes the existing water quality conditions of the Salinas River, Reclamation Ditch and Tembladero Slough system, Blanco Drain, and Lake El Estero. Waters in these water bodies currently discharge directly or indirectly to the Monterey Bay/Pacific Ocean. Under existing conditions, agricultural wash water, after it is treated and percolated at the Salinas Treatment Facility, seeps through subsurface soils to the Salinas River, which in turn discharges to the Monterey Bay/Pacific Ocean. Pure water is evaporated from the ponds and water with some water pollutants percolates through the shallow aquifer and ultimately to seeps to either the Salinas River (estimated to be 80% of the percolated quantity) or to the Salinas Valley Groundwater Basin (estimated to be 20% of the percolated quantity) (Todd Groundwater, 2015a). The Reclamation Ditch flows to the Tembladero Slough and Tembladero Slough flows into the Old Salinas River Channel and ultimately through the Potrero Tide Gate to the Moss Landing Harbor that is directly connected to the Monterey Bay/Pacific Ocean. As the water in the system flows toward the lowest part of the watershed, it collects water from tributaries encompassing a larger watershed.

A benefit of the Proposed Project is that it would divert and treat contaminated waters rather than allowing those waters to flow to the Monterey Bay. The waters would be diverted to the municipal wastewater collection system for conveyance to the MRWPCA Regional Treatment Plant. All waters would receive primary and secondary treatment then a majority of the water would undergo additional treatment and reuse using one of two additional treatment systems:

1. the existing Salinas Valley Reclamation Plant (tertiary treatment system) that supplies agricultural irrigation water to cropland in the Castroville area, or
2. the proposed AWT Facility that would supply purified recycled water for injection into the Seaside Groundwater Basin for later extraction and use for potable supplies.

The proposed treatment processes would destroy many of the typical pollutants through biological and chemical treatment processes, and for other pollutants, through settling or filtration out of the wastewater stream. Most of the settled and filtered pollutants would remain in sewage sludge. Sewage sludge is the solid, semisolid or liquid untreated residue generated during the treatment of domestic sewage in a treatment facility. Sewage sludge would then be dried to form biosolids. Federal and state standards and regulations ensure that biosolids are safely recycled or disposed. Local governments make the decision whether to recycle the biosolids as a fertilizer, incinerate it, or bury it in a landfill. (Source: EPA, 2014) [12] MRWPCA disposes of biosolids at the adjacent MRWMD landfill and would continue to do so if the Proposed Project is implemented. Biosolids disposal at the MRWMD landfill would not add to pollutant loads on the marine environment because the landfill is regulated to ensure that solid waste disposal does not result in contamination of water resources, including groundwater, surface water bodies like the Salinas River, and the Monterey Bay and Pacific Ocean.

Salinas Pump Station and Salinas Treatment Facility Storage and Recovery Diversion and Storage Sites: Diversions of Agricultural Wash Water and Salinas Stormwater

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 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 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. 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.

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.

The existing water that percolates from the Salinas Treatment Facility and seeps to the Salinas River can affect water quality due to any differences in the concentrations of individual chemical constituents in the Salinas Treatment Facility ponds, rapid infiltration basins, and drying beds

[12] See also: http://water.epa.gov/polwaste/wastewater/treatment/biosolids/genqa.cfm and http://water.epa.gov/scitech/wastetech/biosolids/503pe_index.cfm for more information on biosolids.

compared to existing concentrations in the river. In addition, the existing seepage from the ponds to the river can result in exceedances of water quality objectives (or worsening of water quality exceedance) for the River. **Table 4.11-14** prepared by Todd Groundwater, compares median concentrations of chloride, nitrate, TDS, and phosphorus between the ponds and the river (Todd Groundwater, 2015a).

Table 4.11-14
Comparison of Water Quality in Salinas Treatment Facility Ponds and Salinas River

Water Source	Chloride (mg/L)	Nitrate (mg/L as NO_3)	TDS (mg/L)	Phos-phorus (mg/L as P)	Notes
Salinas Treatment Facility Ponds 1-3	301	20	1,090	--	Median of 12 monthly samples during 2013. Total nitrogen converted to nitrate.
Salinas Treatment Facility Ponds	237	26	1,228	27	Median of six samples collected during July 2013 to February 2014
Salinas River at South Davis Road (upstream of Salinas Treatment Facility)	70	31	618	0.1	CCAMP data. Medians of 92-100 samples during 1998-2011. Primarily low-flow data.
Water Quality Objectives					
Salinas River below Spreckels	250[a]	6.2 to 28[b]	500 to 1,000[c]	0.07 to 0.13[b]	Basin Plan for the Central Coast Region, and RWQCB Resolution R3-2013-2008b, except as noted

Notes:
CCAMP = Central Coast Ambien Monitoring Program RWQCB = Central Coast Regional Water Quality Control Board

[a] The drinking water standard for municipal use is shown. Agricultural crops can experience "increasing problems" at concentrations ranging from 142 to 355 mg/L.
[b] Dry-season TMDL objectives for the lower Salinas River.
[c] The lower and upper secondary drinking water standards are shown. Agricultural crops can experience "increasing problems" at electrical conductivity values that correspond to approximately 500 to 2,000 mg/L of TDS. The pond water in that Salinas Treatment Facility is high in sugars due to its prior use for produce washing, thus typical primary and secondary treatment processes can reduce the TDS shown here.

Source: Todd Groundwater, 2015a [adapted from Table 6 in **Appendix N**].

Schaaf & Wheeler also assessed the water quality impacts of the proposed diversions of agricultural wash water and Salinas stormwater to the Regional Treatment Plant. **Table 4.11-2** in **Section 4.11.2.3** shows the existing Salinas River water quality and standards (adopted and proposed TMDLs) and **Table 4.11-3,** in **Section 4.11.2.3** compares the most recent sampling results (2012-2013 for Salinas stormwater and 2013 for Salinas Treatment Facility effluent) to the standards. Effluent from the Salinas Treatment Facility is not tested for ammonia or orthophosphate, so a general water quality comparison with the Salinas River cannot be made (Schaaf & Wheeler, 2015a).

Based on the above technical analysis, the following conclusions were drawn:

- Median concentrations of TDS, chloride, and phosphorus are higher in the Salinas Treatment Facility ponds (aeration pond effluent) than in the Salinas River and thus occasionally degrades Salinas River water quality for these constituents;
- Existing Salinas Treatment Facility pond percolation water that seeps into the Salinas River consistently exceeds the Basin Plan water quality objectives and TMDLs for constituents in **Table 4.11-3** and **Table 4.11-14**;
- Diverting agricultural washwater to the Proposed Project may result in reduced TDS levels in the river, particularly in summer months when percolation from the Salinas Treatment Facility makes up a significant portion of the river flow.

- Existing Salinas Treatment Facility pond percolation may degrade river water quality with respect to phosphorus.

Because the GWR Project would decrease the annual volume of water percolated at the Salinas Treatment Facility by approximately 1,600 to 2,300 AFY and the amount of seepage to the river by 1,280 to 1,840 AFY (depending upon the year type and baseline scenario used), the proposed diversions would decrease the total mass loading (environmental input) of all of these contaminants to the river and would have a beneficial impact on river water quality. Under the current condition described in detail in **Section 4.11.2** with increased flows released from the reservoirs to the Salinas River Diversion Facility during the summer months, the Salinas Treatment Facility inflows represent a smaller percentage of the total streamflow and the water quality changes due to their elimination as influent to the river would be less than if flow were not managed (Schaaf & Wheeler, 2015a).

The results in **Table 4.11-3**, above, are typical of those in previous annual reports and can be used to assess changes in Salinas River quality due to reduction in pollutant loads if stormwater is diverted to the Regional Treatment Plant. The stormwater runoff is generally of equal or better quality than the Salinas River to which it currently flows, except perhaps during the first flush of each wet weather season. It meets the Central Coast RWQCB Basin Plan objectives in some categories. In the categories of turbidity and orthophosphate, it exceeds the Basin Plan objectives but is below the average concentration in the receiving stream. Although the stormwater runoff may slightly improve the quality of the water in the river during storm events, the Salinas River basin is so large and the flows during storm events are so high (100 to ten thousand cubic feet per second) diverting urban stormwater runoff to the Proposed Project would not have an adverse impact on water quality within the Salinas River (Schaaf & Wheeler, 2015a).

Reclamation Ditch, Tembladero Slough, and Blanco Drain Diversions Sites: Impaired Surface Water

The Proposed Project would divert water from the Reclamation Ditch at Davis Road, from Tembladero Slough near Castroville, and from Blanco Drain at the existing pump station, and would convey those waters to the Regional Treatment Plant for treatment, including recycling and reuse. The diversion and conveyance facilities to achieve this and the methods of diversion are described in **Section 2.7.2** of **Chapter 2**. See **Figures 4.4-1** and **4.4-2,** in **Section 4.4, Biological Resources: Fisheries** for the location of the diversion points and the associated water bodies.

Overview of Diversion Methods and Facilities

Reclamation Ditch Diversion. 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.**

Based on the proposed location of diversion, the potentially affected surface water bodies for this analysis include the following:

- downstream reaches of the Reclamation Ditch (from Davis Road to its confluence with the Tembladero Slough near Castroville),
- the Tembladero Slough downstream of the Reclamation Ditch confluence,
- downstream affected reaches of Old Salinas River channel from the Tembladero Slough confluence to the Potrero Tide Gate, and
- the Moss Landing Harbor and Monterey Bay.

Tembladero Slough Diversion. 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.**

Based on the proposed location of diversion, the potentially affected surface water bodies for the Tembladero Slough analysis include the following:

- the Tembladero Slough downstream of the proposed diversion near Highway 1 to its confluence with the Old Salinas River Channel,
- downstream affected reaches of Old Salinas River channel from the Tembladero Slough confluence to the Potrero Tide Gate, and
- the Moss Landing Harbor and Monterey Bay/Pacific Ocean.

Blanco Drain Diversion. The Blanco Drain collects water from approximately 6,400 acres of agricultural lands near Salinas. The Proposed Project would include improvements that would enable tile drain and surface runoff water in the Blanco Drain to be diverted and conveyed to the Regional Treatment Plant to be recycled.

The proposed new Blanco Drain Diversion pump station would be located adjacent to the existing seasonal pump station operated by MCWRA. 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.[13] 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.**

Overview of Water Quality Impacts Analyses

The following three types of water quality impacts are analyzed in this section related to diversions of surface waters from the Reclamation Ditch, Tembladero Slough, and Blanco Drain.

- *Pollutant Load Reductions*. The Pollutant Load Reductions section presents a summary of the analyses prepared by Schaaf & Wheeler that estimated the reductions in pollutant loads (or the total annual mass of pollutants removed from the environment) due to diversion of water that has been documented to have high concentrations of pollutants (see **Section 4.11.2.3**) and thus are considered impaired in accordance with the Clean Water Act section 303(d) listing.
- *Hydrologic Changes that Could Cause Erosion and Sedimentation*. This section analyzes the operational water quality impacts that may occur due to hydrologic changes caused by the diversions and the resultant erosion and sedimentation conditions (including due to alterations of drainage patterns and changes to runoff) that may occur downstream of the surface water diversions.
- *Hydrologic Changes that Could Increase Salinity.* The third analysis is related to the potential for salinity increases due to diverting water that would be less saline than the existing downstream water in the lower watershed.

Pollutant Load Reductions – Reclamation Ditch and Tembladero Slough

A benefit of the Proposed Project is that it would remove waters of marginal quality due to diversion as source water to meet the Proposed Project objectives. Diversion of water from the Reclamation Ditch and Tembladero Slough would remove a portion of the current pollutant load from the streams that ultimately flow to the Monterey Bay. The water quality (in terms of concentrations) of the water remaining within the streams may not noticeably improve; however, the reduction in pollutant-loaded flows would have a positive effect on the water quality in the Moss Landing Harbor below Potrero Road tide gates and in the Monterey Bay and Pacific Ocean.

Pollutant removal was estimated using the conversion formula 1 mg/L = 2.7 pounds/acre-foot. **Table 4.11-15** and **Table 4.11-16** show the estimates for diverting 6 cfs from the Reclamation Ditch at Davis Road and 3 cfs from Tembladero Slough at Castroville, respectively. The average annual flows in the system and the amount proposed to be diverted are included for comparison.

[13] 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**.

Table 4.11-15
Estimated Pollutant Removal due to Proposed Surface Water Diversion from Reclamation Ditch at Davis Road, 6 cfs capacity

Pollutant	Average Conc.	Average Annual Flow	Average Pollutant Load	Diverted Flow	Diverted Pollutant Load
	(mg/L)	(AFY)	(lb/yr)	(AFY)	**(lb/yr)**
Ammonia as N, Unionized	0.029	7,640	597	1,611	**126**
Ammonia as NH3	0.61	7,640	12,581	1,611	**2,653**
Chloride	106.41	7,640	2,195,025	1,611	**462,852**
Chlorophyll a, water column	0.016	7,640	332	1,611	**70**
Chlorpyrifos	0.0016	7,640	32	1,611	**7**
Diazinon	0.10	7,640	2,058	1,611	**434**
Dissolved Solids, Total	641.83	7,640	13,239,724	1,611	**2,791,780**
Nitrate as N	13.00	7,640	268,084	1,611	**56,529**
OrthoPhosphate as P	0.65	7,640	13,327	1,611	**2,810**
Suspended Solids, Total	69.46	7,640	1,432,718	1,611	**302,108**

Source: Schaaf & Wheeler, 2015b

Table 4.11-16
Estimated Pollutant Removal due to Proposed Surface Water Diversions from Tembladero Slough at Castroville, 3 cfs capacity

Pollutant	Average Conc.	Average Annual Flow	Average Pollutant Load	Diverted Flow	Diverted Pollutant Load
	(mg/L)	(AFY)	(lb/yr)	(AFY)	(lb/yr)
Ammonia as N, Unionized	0.010	10,696	836	1,536	120
Ammonia as NH3	0.03	10,696	17,613	1,536	2,529
Chloride	876.41	10,696	3,073,036	1,536	441,304
Chlorophyll a, water column	0.037	10,696	464	1,536	67
Chlorpyrifos	0.0111	10,696	45	1,536	6
Diazinon	0.20	10,696	2,881	1,536	414
Dissolved Solids, Total	2,024.71	10,696	18,535,614	1,536	2,661,808
Nitrate as N	28.59	10,696	375,317	1,536	53,897
OrthoPhosphate as P	0.43	10,696	18,658	1,536	2,679
Suspended Solids, Total	133.85	10,696	2,005,805	1,536	288,044

Source: Schaaf & Wheeler, 2015b

Pollutant Load Reductions - Blanco Drain Diversion

A benefit of the Proposed Project is that it would remove waters of marginal quality due to diversion as source water to meet the Proposed Project objectives. Diversion of water from the Blanco Drain would remove a portion of the current pollutant load from the Salinas River that ultimately flows to the Salinas River Lagoon and Monterey Bay (directly or through the Old Salinas River Channel to the Moss Landing Harbor). The water quality (in terms of concentrations) of the water remaining within these water bodies may not noticeably improve; however, the reduction in pollutant-loaded flows would have a positive effect on the water quality in the Old Salinas River Channel, Moss Landing Harbor below Potrero Road tide gates, and in the Monterey Bay and Pacific Ocean.

In the Biological Opinion for the Salinas Valley Water Project (that included the Salinas River Diversion Facility), NMFS recommended diverting the Blanco Drain flows to the Regional Treatment Plant as a means of improving the habitat in the Salinas River Lagoon. Removing water from the Blanco Drain and conveying it to the Regional Treatment Plant for treatment and reuse would reduce the dissolved and suspended pollutant load on the Salinas River (i.e., reduction in the environmental load). The quantity removed may be estimated using the conversion factor 1 mg/L = 2.7 lb/AF. **Table 4.11-17** below shows the estimated annual pollutant removal, assuming average annual flow conditions and historic average pollutant concentrations under the Proposed Project diversion of 6 cfs maximum pumping capacity. The average annual flows in the system and the amount proposed to be diverted are included for comparison.

Table 4.11-17
Estimated Pollutant Removal due to Proposed Surface Water Diversions from Blanco Drain

Pollutant	Average Conc.	Average Annual Flow	Average Pollutant Load	Diverted Flow	Diverted Pollutant Load
	(mg/L)	(AFY)	(lb/yr)	(AFY)	(lb/yr)
Ammonia as N, Unionized	0.014	2,620	98	2,620	98
Ammonia as NH3	0.20	2,620	1,432	2,620	1,432
Chlorophyll a, water column	0.0021	2,620	15	2,620	15
Chlorpyrifos	0.00085	2,620	6	2,620	6
Diazinon	0.011	2,620	76	2,620	76
Dissolved Solids, Total	2019.7	2,620	14,287,358	2,620	14,287,358
Nitrate as N	65.27	2,620	461,726	2,620	461,726
OrthoPhosphate as P	0.85	2,620	6,026	2,620	6,026
Source: Schaaf & Wheeler, 2014b					

Inter-related Salinity and Water Level Impacts

The Tembladero Slough and Old Salinas River channel are tidally influenced, with a well-defined halocline (higher salinity at the bottom of the channel[14]). The tidal effects are dampened by the tide (flap) gates on the Old Salinas River at Potrero Road, but brackish water still passes through the gates. The upstream migration of the saline layer is controlled, in part, by freshwater inflows that provide dilution at low flows and which push the salt water downstream at higher flows. The estuary typically sees seasonal increases in salinity, with peak levels occurring in late summer before the on-set of winter rains. Students in the Central Coast Watershed Studies Program at CSUMB studied salinity in the Tembladero Slough on several days in November 2010 and again in November 2014. Calendar year 2010 was a wet year, and also the first year that the Salinas River Diversion Facility (SRDF) was in operation. Releases from San Antonio and Nacimiento Reservoirs were increased for rediversion at the SRDF, and while the facility

[14] Central Coast Watershed Studies Program, 2010 and 2014 reports on Spatial and Temporal Variations on Streamflow and Water Quality in the Tembladero Slough.

was operating a minimum of 2 cfs was released to the Salinas Lagoon, which is tributary to the Old Salinas River Channel. In 2010, the lagoon opened to the ocean on December 25 (after the 2010 sampling period was completed), and stayed open until September 21, 2011. Conversely, the 2014 sampling period came at the end of an extended drought, with record low rainfall during the period 2012 to 2014. The Salinas River Lagoon was last open to the ocean on January 27, 2013. The Salinas River Diversion Facility was not operated during the summer of 2014, so there were no upstream reservoir releases augmenting flows into the lagoon and the Old Salinas River.

As shown in **Table 4.11-6**, the total dissolved solids concentrations in the Reclamation Ditch below Carr Lake ranged from 642 to 1,080 mg/L (equivalent to 0.64 to 1.08 ppt). As shown in **Table 4.11-7**, the total dissolved solids concentrations in the Tembladero Slough ranged from 2,025 to 18,000 mg/L (equivalent to 2 to 18 ppt). A 2010 study by CCOWS, discussed above, found salinities at the lower end of the Tembladero Slough ranging from 1 to 15 parts per thousand (ppt). In 2014, salinities at that location ranged from 1 to 20 ppt. Seawater has salinity of about 35 ppt, so while there was a definite increase in salinity due to the prolonged drought that has occurred from 2012 through 2014, the Slough remained a brackish estuary. There were rainfall events during both the 2010 and 2014 sampling periods, and the post-rainfall sampling showed similar low salinities (under 1 ppt) in both years. The 2014 study extended the water sampling upstream into the Reclamation Ditch, and found that the saline layer was detectable as far upstream as Haro Road in Castroville. This information leads to the conclusion that salinity is controlled almost exclusively by the ocean due to tidal influence and by rainfall that results in periods of high flows in the surface waters. Lower background flows during the drought conditions mimic conditions that might occur when proposed project diversions would occur. These reductions in overall flows from the watershed that flows into the water bodies in the lower watershed had little effect on the high and low range of salinities.

The Proposed Project would divert up to 80% of the available flows from the Reclamation Ditch/Tembladero Slough in the summer months (June to October), which may result in increased salinity near the water surface, and/or longer periods of salinity accumulation in the Tembladero Slough before seasonal flushing by winter runoff. Diversions from the Reclamation Ditch and Tembladero Slough would be most needed by the Proposed Project during dry years when irrigation demands are highest. Due to the tidal influence, water levels in the Tembladero Slough would not be noticeably affected by the project, so wetland species would not see a loss of wetted habitat due to salinity changes, only an increase in the duration of periods of higher salinity. The existing system exhibits a wide variation of salinities due to the influence of the ocean tidal fluctuations, storm surges, agricultural tile drain and surface runoff, and urban runoff; therefore, the salinity changes due to the Proposed Project would be within the range of salinities that are currently found in these water bodies every year. Based on the above information, these changes would result in a less-than-significant impact on surface water quality in the affected reaches of the Reclamation Ditch, Tembladero Slough and the Old Salinas River Channel. Additional discussion of impacts to wetland and riparian habitat is provided in **Section 4.5, Biological Resources: Terrestrial**.

Erosion and Sedimentation due to Hydrologic Changes

Operation of proposed surface water diversion components on the Reclamation Ditch, Tembladero Slough, and Blanco Drain could result in increased erosion and subsequent sedimentation/siltation, with adverse impacts to surface water quality.

The diversions of agricultural wash water, Salinas urban runoff, and flows from the Blanco Drain, would capture some stormwater which currently flows to the Salinas River. Reducing urban runoff into the Salinas River, particularly the first flush as storms begin, would reduce the amount of suspended solids conveyed to the river and may reduce peak flows being discharged into the river. The change in operation at the Salinas Treatment Facility to facilitate the diversion of agricultural wash water and Salinas urban runoff would have no effect on erosion and siltation, because that water is currently disposed of using evaporation and percolation and would continue to percolate however at a lesser amount due to diversions to the Regional Treatment Plant and recovery of stored water to the Regional Treatment Plant. The diversion of Blanco Drain flows would reduce the amount of sediment carried from the Blanco Drain into the main stem of the Salinas River, and the channel around the inlet structure for the diversion pump station would be lined with concrete to prevent local scour and erosion. The Blanco Drain diversion may not operate during wet winter months when storm runoff typically occurs. In that case, the conveyance of sediment from the Blanco Drain into the River would be no greater than under the current condition (Schaaf & Wheeler, 2015a).

Although the channel around the inlet structure for the diversion pump station would be lined with concrete to prevent local scour and erosion, diversions from the water bodies may result in rapid water-level fluctuations that could, if not managed correctly, increase erosion and sedimentation downstream of the diversion points, including potentially increased incidences of bank collapse. Erosion due to water-level fluctuations would not occur at the Blanco Drain diversion site because the proposed pump station would be placed adjacent to the existing pump station that limits the water level fluctuations and has been demonstrated to not result in erosion bank collapse. In addition, water-level fluctuations would not result in erosion or sedimentation due to diversions at the Tembladero Slough Diversion site where maximum diversions would rarely affect water levels due to the pooling, backwater effect of the Potrero Tide Gates and wide channel in this reach of the water body.

At higher background flow levels (i.e., 10-year storm event or larger) within the Reclamation Ditch, sediment-transport rates are higher, and pool scour-and-fill processes, bar mobility, and bank instability are active and expected in any earthen drainage system. In addition, higher flows occur during and following rain storms when water levels in this water body are dynamic, typically rising rapidly during the storm and receding quickly as the storm passes. Water levels in these waterbodies rise highest during a sequence of storms and develop a seasonal peak of 100 to 200 cubic feet per second or more. Two or three seasonal peaks are common during a typical wet season. The natural erosion and sediment transport processes dominate the ditch system during these high flow events. In these high flow events, the proposed diversions would not result in increased erosion and sedimentation because the diversion may reduce high flows albeit only by a small percent (at most approximately 5 to 10%). In addition, as discussed in the **Chapter 2, Project Description** (see **Section 2.7.1.2)**, the diversion would be reduced when irrigation demands decrease and adequate flows of other source waters are available for recycling. For these reasons during high flow conditions (i.e., during and after 10-year or greater storm events), potential erosion, sedimentation (i.e., increases in turbidity) and bank collapse due to water-level fluctuations would not be detectable. According to Schaaf & Wheeler, the conveyance of sediment from the Reclamation Ditch/Tembladero Slough into the Old Salinas River would be no greater than under the current condition (Schaaf & Wheeler, 2015b).

Ongoing rapid water-level fluctuations associated with diversion regimes at the Reclamation Ditch Diversion site may result in erosion and sedimentation, including due to bank failure of the Reclamation Ditch west of Davis Road and the portion of Tembladero Slough between its confluence with the Reclamation Ditch and the Highway 1 bridge. The Reclamation Ditch Diversion component proposes a diversion of up to 6 cubic feet per second (cfs) during the dry seasons (typically, June through October). In some cases, those diversions would be as much as 80% of the flow in the water body and thus rapid water fluctuations may induce erosion and sedimentation, or bank failure. This is a potentially significant impact that can be reduced to a less-than-significant level with implementation of Mitigation Measure HS-4, below.

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. Lake El Estero Water is proposed to be diverted (when available) by gravity or using a small pump to the municipal wastewater collection system in the vicinity of the City of Monterey's existing stormwater management pump station at the northeastern corner of Lake El Estero. This diversion would occur in lieu of pumping lake water into the city's storm drainage pipelines or allowing it to overflow into storm drainage pipelines. Lake El Estero is a land-locked water body that only discharges to the ocean during large storm events; in these cases, lake water is pumped or flows by gravity through pipelines under Del Monte Boulevard and adjacent parkland. These pipelines currently discharge stormwater via man-made outfalls onto the nearby Del Monte State Beach above the normal high water line. The pump station intake is screened to prevent fish from entering the station. The outfall structure is gated to prevent sand from accumulating inside the structure when not in use. If the pump station cannot divert the full volume of stormwater runoff entering the lake and the lake level rises sufficiently, the excess water flows through two 33-inch gravity pipelines to a second point of discharge on Del Monte State Beach, west of the pump station outfall.

The RWQCB *Basin Plan* designates beneficial uses of Lake El Estero as including municipal and domestic supply, groundwater recharge, water contact recreation, non-contact water recreation, wildlife habitat, cold water fish habitat, warm water fish habitat, spawning/reproduction/early development habitat and commercial or sport fishing. The Monterey Harbor portion of the Monterey Bay has designated beneficial uses of water contact recreation, non-contact water recreation, industrial service supply, navigation, marine habitat, shellfish harvesting, commercial or sport fishing and rare/threatened/endangered species habitat.

Lake El Estero is not listed as an impaired water body, but Majors Creek (a tributary stream to Lake El Estero) and the Monterey Harbor are listed as impaired water bodies. Majors Creek is listed as impaired for copper, lead, zinc and Escherichia coliform. The Monterey Harbor is listed as impaired for metals and sediment toxicity. Water quality has been sampled and monitored for the past 15 years under various programs, including the Central Coast Long-term Environmental Assessment Network, the Monterey Bay Sanctuary Citizen Watershed Monitoring Network and the City of Monterey Urban Watch. The Monterey Regional Storm Water Management Program identifies water quality objectives for stormwater discharging into the Monterey Bay.

Stormwater runoff can carry pollutants such as oils, sediments and metals into the Monterey Bay, which is a National Marine Sanctuary. However, Lake El Estero serves as a settling basin for stormwater, which is a treatment process for the stormwater. Water passing through the lake carries lower levels of suspended solids than stormwater discharging directly to the Bay. The impact of diverting water to the Regional Treatment Plant instead of discharging the water to the beach would not result in a measurable change to existing water quality, either in the Lake itself or in the Monterey Bay and ocean (Schaaf & Wheeler, 2014a). Therefore, the proposed Lake El Estero Diversion would not impact water quality in the lake or in Monterey Bay.

All Other Project Components

None of the other Proposed Project components would impact surface water quality during operation due to their location and function. Impacts related to marine water quality due to ocean discharge of wastewater from the Advanced Water Treatment Facility at the Regional Treatment Plant are addressed in Impact HS-5. Therefore, no impacts associated with the other Proposed Project components are anticipated and no mitigation measures would be required.

Impact Conclusion

The Proposed Project would result in water quality benefits due to proposed diversions of polluted surface waters and wastewaters and treatment of those waters at the Regional Treatment Plant, as documented in this section and in **Appendices N, O, P, and Q.** During the dry seasons (typically, June through October) proposed diversions of surface water from the Reclamation Ditch would be as much as 80% of the flow in that drainage channel and thus rapid water fluctuations may induce erosion and sedimentation within the downstream affected reach of the Reclamation Ditch and Tembladero Slough (except west of the Highway 1 crossing where the tidal backwater effect dominates water level changes and would suppresses these imposed water level changes). This is a significant impact that would be reduced to a less-than-significant with implementation of the following mitigation measure.

Mitigation Measure

Mitigation Measure HS-4: Management of Surface Water Diversion Operations (Applies to Reclamation Ditch Diversion, only)

Rapid, imposed water-level fluctuations shall be avoided when operating the Reclamation Ditch Diversion pumps to minimize erosion and failure of exposed (or unvegetated), susceptible banks. This can be accomplished by operating the pumps at an appropriate flow rate, in conjunction with commencing operation of the pumps only when suitable water levels or flow rates are measured in the water body. Proper control shall be implemented to ensure that mobilized sediment would not impair downstream habitat values and to prevent adverse impacts due to water/soil interface adjacent to the Reclamation Ditch and Tembladero Slough.

Impact HS-5: <u>Operational Marine Water Quality due to Ocean Discharges</u>. Proposed Project operational discharges of reverse osmosis concentrate to the ocean through the MRWPCA outfall would not violate water quality standards or waste discharge requirements, or otherwise substantially degrade water quality. (Criteria a and e) (Less than Significant)

Treatment Facilities at the Regional Treatment Plant

The reverse osmosis process included in the proposed Advanced Water Treatment Facility (a component of the Treatment Facilities at the Regional Treatment Plant) would remove dissolved inorganics and organics from the waste water. The inorganics and organics removed from the treated water would be concentrated into a new waste stream. This waste stream (called concentrate) would be combined with Regional Treatment Plant secondary effluent when it is available and discharged via MRWPCA's existing ocean outfall. The secondary effluent (or Regional Treatment Plant effluent) is currently composed of both municipal wastewater and some discrete flows of dry weather urban runoff treated through the primary and secondary treatment process described in **Section 2.5.1**. The Regional Treatment Plant currently recycles a majority of the secondary effluent through the co-located Salinas Valley Reclamation Plant, a tertiary treatment plant that produces recycled water for agricultural land irrigation. The flows that exceed the demands for tertiary-treated water are disposed via the ocean outfall. In addition, an estimated maximum of 0.1 mgd of trucked-in brine waste is also disposed through the outfall with secondary effluent. Secondary effluent water quality data are provided in **Appendix D** (see Appendix B of the Nellor Environmental Associates, Inc. February 2015). Historical actual secondary flow quantities and future projections of wastewater flows are presented in **Chapter 2, Project Description**.

Impacts to water quality associated with the reverse osmosis by-product discharge (also referred to as reverse osmosis concentrate) combined with a range of wastewater and hauled brine quantities were compared to the Ocean Plan water quality objectives at the edge of the zone of initial dilution. The analysis is based on dilution modeling conducted by FlowScience and water quality concentration spreadsheet analysis conducted by Trussell Technologies on behalf of MRWPCA. **Figure 4.11-9** shows a schematic of the methodology and data sources used to assess the Proposed Project's impact on marine water quality

As described above, the Ocean Plan compliance analysis estimated the worst-case water quality for each of the three future discharge components: future Regional Treatment Plant effluent, Proposed Project reverse osmosis concentrate, and hauled brine waste. A summary of the estimated water qualities of these components is given in **Table 4.11-18.** Additional considerations and assumptions for each constituent are documented in the **Table 4.11-18** notes section.

Table 4.11-18
Summary of Estimated Worst-Case Water Quality for the Three Waters that Would Be Discharged through the Ocean Outfall

Constituent	Units	Secondary Effluent	Hauled Brine	Reverse Osmosis Concentrate	Notes
Ocean Plan water quality objectives for protection of marine aquatic life					
Arsenic	µg/L	45	45	12	1,12
Cadmium	µg/L	1.2	1.2	6.4	2,11
Chromium (Hexavalent)	µg/L	2.7	130	14	2,11
Copper	µg/L	25.9	39	136	2,11
Lead	µg/L	0.82	0.82	4.3	2,11
Mercury	µg/L	0.089	0.089	0.510	5,12
Nickel	µg/L	13.1	13.1	69	2,11
Selenium	µg/L	6.5	75	34	2,11
Silver	µg/L	*ND(<1.59)*	ND(<1.59)	ND(<0.19)	4,14
Zinc	µg/L	48.4	48.4	255	2,11
Cyanide (MBAS data)	µg/L	89.5	89.5	143	2,12,13,16
Cyanide	µg/L	7.2	46	38	6,11,16
Total Chlorine Residual	µg/L	*ND(<200)*	*ND(<200)*	*ND(<200)*	10
Ammonia (as N), 6-month median	µg/L	36,400	36,400	191,579	1,11
Ammonia (as N), daily maximum	µg/L	49,000	49,000	257,895	1,11
Acute Toxicity	TUa	2.3	2.3	0.77	7,12,13
Chronic Toxicity	TUc	40	40	100	7,12,13
Phenolic Compounds (non-chlorinated)	µg/L	69	69	363	1,9,11
Chlorinated Phenolics	µg/L	*ND(<20)*	*ND(<20)*	ND(<20)	4,14
Endosulfan	µg/L	0.048	0.048	0.25	5,9,11
Endrin	µg/L	0.000079	0.000079	0.00	3,11
HCH (Hexachlorocyclohexane)	µg/L	0.060	0.060	0.314	11
Radioactivity (Gross Beta)	pCi/L	32	307	34.8	1,7,12,13
Radioactivity (Gross Alpha)	pCi/L	18	457	14.4	1,7,12,13
Objectives for protection of human health - noncarcinogens					
Acrolein	µg/L	9.0	9.0	47	2,11
Antimony	µg/L	0.79	0.79	4	1,11
Bis (2-chloroethoxy) methane	µg/L	*ND(<4.2)*	*ND(<4.2)*	*ND(<1)*	4,14
Bis (2-chloroisopropyl) ether	µg/L	*ND(<4.2)*	*ND(<4.2)*	*ND(<1)*	4,14
Chlorobenzene	µg/L	*ND(<0.5)*	*ND(<0.5)*	*ND(<0.5)*	4,14
Chromium (III)	µg/L	7.3	87	38	1,11
Di-n-butyl phthalate	µg/L	*ND(<7)*	ND(<7)	*ND(<1)*	4,14
Dichlorobenzenes	µg/L	*1.6*	*1.6*	*8*	1,11
Diethyl phthalate	µg/L	*ND(<5)*	*ND(<5)*	*ND(<1)*	4,14
Dimethyl phthalate	µg/L	*ND(<2)*	*ND(<2)*	*ND(<0.5)*	4,14
4,6-dinitro-2-methylphenol	µg/L	*ND(<20)*	*ND(<20)*	*ND(<5)*	4,14
2,4-dinitrophenol	µg/L	*ND(<13)*	*ND(<13)*	*ND(<5)*	4,14
Ethylbenzene	µg/L	*ND(<0.5)*	*ND(<0.5)*	*ND(<0.5)*	4,14
Fluoranthene	µg/L	*ND(<0.5)*	*ND(<0.5)*	*ND(<0.1)*	4,14
Hexachlorocyclopentadiene	µg/L	*ND(<0.5)*	*ND(<0.5)*	ND(<0.05)	4,14
Nitrobenzene	µg/L	*ND(<2.3)*	*ND(<2.3)*	*ND(<1)*	4,14
Thallium	µg/L	0.69	0.69	3.7	2,11
Toluene	µg/L	*ND(<0.5)*	*ND(<0.5)*	*ND(<0.5)*	4,14
Tributyltin	µg/L	*ND(<0.05)*	*ND(<0.05)*	*ND(<0.02)*	8,14
1,1,1-trichloroethane	µg/L	*ND(<0.5)*	*ND(<0.5)*	*ND(<0.5)*	4,14

Table 4.11-18
Summary of Estimated Worst-Case Water Quality for the Three Waters that Would Be Discharged through the Ocean Outfall

Constituent	Units	Secondary Effluent	Hauled Brine	Reverse Osmosis Concentrate	Notes
Objectives for protection of human health - carcinogens					
Acrylonitrile	µg/L	2.5	2.5	13	2,11
Aldrin	µg/L	*ND(<0.007)*	*ND(<0.007)*	*ND(<0.01)*	4,14
Benzene	µg/L	*ND(<0.5)*	*ND(<0.5)*	*ND(<0.5)*	4,14
Benzidine	µg/L	ND(<19.8)	*ND(<19.8)*	*ND(<0.05)*	4,14
Beryllium	µg/L	ND(<0.69)	0.0052	*ND(<0.5)*	4,14
Bis(2-chloroethyl)ether	µg/L	ND(<4.2)	*ND(<4.2)*	*ND(<1)*	4,14
Bis(2-ethyl-hexyl)phthalate	µg/L	78	78	411	1,11
Carbon tetrachloride	µg/L	0.5	0.5	2.7	2,11
Chlordane	µg/L	0.000735	0.000735	0.00387	3,9,11
Chlorodibromomethane	µg/L	2.4	2.4	13	2,11
Chloroform	µg/L	39	39	204	2,11
DDT	µg/L	0.0011	0.022	0.035	2,9,11
1,4-dichlorobenzene	µg/L	1.6	1.6	8.4	1,11
3,3-dichlorobenzidine	µg/L	*ND(<19)*	*ND(<19)*	*ND(<2)*	4,14
1,2-dichloroethane	µg/L	*ND(<0.5)*	*ND(<0.5)*	*ND(<0.5)*	4,14
1,1-dichloroethylene	µg/L	*ND(<0.5)*	*ND(<0.5)*	*ND(<0.5)*	4,14
Dichlorobromomethane	µg/L	2.6	2.6	14	2,11
Dichloromethane (methylenechloride)	µg/L	0.64	0.64	3.4	2,11
1,3-dichloropropene	µg/L	0.56	0.56	3.0	2,11
Dieldrin	µg/L	0.0005	0.0056	0.0029	2,11
2,4-dinitrotoluene	µg/L	*ND(<2)*	*ND(<2)*	*ND(<0.1)*	4,14
1,2-diphenylhydrazine (azobenzene)	µg/L	*ND(<4.2)*	*ND(<4.2)*	*ND(<1)*	4,14
Halomethanes	µg/L	1.4	1.4	7.5	2,9,11
Heptachlor	µg/L	*ND(<0.01)*	*ND(<0.01)*	*ND(<0.01)*	4,14
Heptachlor epoxide	µg/L	0.000059	0.000059	0.000311	3,11
Hexachlorobenzene	µg/L	0.000078	0.000078	0.000411	3,11
Hexachlorobutadiene	µg/L	0.000009	0.000009	0.000047	3,11
Hexachloroethane	µg/L	*ND(<2.3)*	*ND(<2.3)*	*ND(<0.5)*	4,14
Isophorone	µg/L	*ND(<0.5)*	*ND(<0.5)*	*ND(<0.5)*	4,14
N-Nitrosodimethylamine	µg/L	0.096	0.096	0.150	2,12,13
N-Nitrosodi-N-Propylamine	µg/L	0.076	0.076	0.019	1,12,13
N-Nitrosodiphenylamine	µg/L	*ND(<2.3)*	*ND(<2.3)*	ND(<1)	4,14
PAHs	µg/L	0.0529	0.0529	0.278	3,9,11
PCBs	µg/L	0.000679	0.000679	0.00357	3,9,11
TCDD Equivalents	µg/L	1.54E-07	1.54E-07	8.09E-07	8,9,11
1,1,2,2-tetrachloroethane	µg/L	*ND(<0.5)*	*ND(<0.5)*	*ND(<0.5)*	4,14
Tetrachloroethylene	µg/L	*ND(<0.5)*	*ND(<0.5)*	*ND(<0.5)*	4,14
Toxaphene	µg/L	0.00709	0.00709	3.73E-02	3,11
Trichloroethylene	µg/L	*ND(<0.5)*	*ND(<0.5)*	*ND(<0.5)*	4,14
1,1,2-trichloroethane	µg/L	*ND(<0.5)*	*ND(<0.5)*	*ND(<0.5)*	4,14
2,4,6-trichlorophenol	µg/L	*ND(<2.3)*	*ND(<2.3)*	*ND(<1)*	4,14
Vinyl chloride	µg/L	*ND(<0.5)*	*ND(<0.5)*	*ND(<0.5)*	4,14

Table 4.11-18
Summary of Estimated Worst-Case Water Quality for the Three Waters that Would Be Discharged through the Ocean Outfall

Constituent	Units	Secondary Effluent	Hauled Brine	Reverse Osmosis Concentrate	Notes

Notes:
Regional Treatment Plant Effluent and Hauled Brine Data
[1] Existing Regional Treatment Plant effluent exceeds concentrations observed in other proposed source waters; the value reported is the existing secondary effluent value.
[2] The proposed new source waters may increase the secondary effluent concentration; the value reported is based on predicted source water blends.
[3] Regional Treatment Plant effluent value is based on CCLEAN data; no other source waters were considered due to MRL differences.
[4] MRL provided represents the maximum flow-weighted MRL based on the blend of source waters.
[5] The only water with a detected concentration was the Regional Treatment Plant effluent, however the flow-weighted concentration increases due to higher MRLs for the proposed new source waters.
[6] Additional source water data are not available; the reported value is for Regional Treatment Plant effluent.
[7] Calculation of the flow-weighted concentration was not feasible due to constituent and the maximum observed value reported.
[8] Agricultural Wash Water data are based on an aerated sample, instead of a raw water sample.
[9] This value in the Ocean Plan is an aggregate of several congeners or compounds. Per the approach described in the Ocean Plan, for cases where the individual congeners/compounds were less than the MRL, a value of 0 is assumed in calculating the aggregate value, as the MRLs span different orders of magnitude.
[10] For all waters, it is assumed that dechlorination will be provided when needed such that the total chlorine residual will be below detection.
Reverse Osmosis Concentrate Data
[11] The value presented represents a calculated value assuming no removal prior to reverse osmosis, complete rejection through reverse osmosis membrane, and an 81% reverse osmosis recovery.
[12] The value represents the maximum value observed during the pilot testing study.
[13] The calculated value for the reverse osmosis concentrate data (described in note 11) was not used in the analysis because it was not considered representative. It is expected that the value would increase as a result of treatment through the AWT Facility (*i.e.,* formation of N-Nitrosodimethylamine as a disinfection by-product), or that it will not concentrate linearly through the reverse osmosis (*i.e.,* toxicity and radioactivity).
[14] The MRL provided represents the limit from the source water and pilot testing monitoring programs.
[15] The value presented represents a calculated value assuming 20% removal through primary and secondary treatment, 70% and 90% removal through ozone for DDT and dieldrin, respectively (based on Oram, 2008), complete rejection through the reverse osmosis membrane, and an 81% reverse osmosis recovery. The assumed Regional Treatment Plant concentrations for Dieldrin and DDT do not include contributions from the agricultural drainage waters. This is because in all but one flow scenario (Scenario 4, described later), either the agricultural drainage waters are not being brought into the Regional Treatment Plant because there is sufficient water from other sources (*i.e.,* during wet and normal precipitation years), or the Regional Treatment Plant effluent is not being discharged to the outfall (*i.e.,* summer months). In this one scenario (Scenario 4), there is a minimal discharge of secondary effluent to the ocean during a drought year under Davidson ocean conditions; for this flow scenario only, different concentrations are assumed for the Regional Treatment Plant effluent. DDT and dieldrin concentrations of 0.022 µg/L and 0.0056 µg/L were used for Scenario 4 in the analysis.
Cyanide Data
[16] In mid-2011, MBAS began performing the cyanide analysis on the Regional Treatment Plant effluent, at which time the reported values increased by an order of magnitude. Because no operational or source water composition changes took place at this time that would result in such an increase, it is reasonable to conclude the increase is an artifact of the change in analysis method and therefore questionable. Therefore, the cyanide values as measured by MBAS are listed separately from other cyanide values, and the MBAS data were not be used in the analysis for evaluating compliance with the Ocean Plan objectives for the EIR.

Ocean Modeling Results

FlowScience performed modeling of various discharge scenarios that include combinations of Regional Treatment Plant secondary effluent, hauled brine waste, and Proposed Project reverse osmosis concentrate (FlowScience, 2014). Year-round compliance with the Ocean Plan objectives was assessed through the evaluation of five representative discharge scenarios. All scenarios assume the maximum flow rates for the reverse osmosis concentrate and hauled brine waste, which is a conservative assumption in terms of constituent loading and minimum dilution. Various secondary effluent flows were used in the compliance analysis, which represent the different types of future discharge compositions.

The five scenarios used for the compliance assessment in terms of secondary effluent flows to be discharged with the other discharges are shown in **Table 4.11-19**, and include:

(1) **Regional Treatment Plant Design Capacity:** maximum flows for the Proposed Project with all 172 discharge ports open[15]. The Oceanic ocean condition was used as it represents the worst-case dilution for this flow scenario. This scenario represents the maximum NPDES-permitted wastewater flow (with the Proposed Project in operation).

(2) **Maximum Flow under Current Port Configuration:** the maximum flow that can be discharged with the current ports configuration (130 of the 172 ports open)[16]. The Oceanic ocean condition was used as it represents the worst-case dilution for this flow scenario. This scenario was chosen as it represents the maximum wastewater flow under the existing diffuser conditions.

(3) **Minimum Wastewater Flow (Oceanic/Upwelling):** the maximum influence of the Proposed Project reverse osmosis concentrate on the ocean discharge under Oceanic/Upwelling ocean conditions (i.e., no secondary effluent discharged). The Oceanic ocean condition was used as it represents the worst-case dilution for this flow scenario.

(4) **Minimum Wastewater Flow (Davidson):** the maximum influence of the Proposed Project reverse osmosis concentrate on the ocean discharge under Davidson ocean condition (i.e., the minimum wastewater flow). Observed historic wastewater flows generally exceed 0.4 mgd during Davidson oceanic conditions. Additional source waters would be brought into the Regional Treatment Plant if necessary to maintain the 0.4 mgd minimum.

(5) **Moderate Wastewater Flow:** conditions with a moderate wastewater flow when the Proposed Project reverse osmosis concentrate has a greater influence to the water quality than in Scenarios 1 and 2, but where the ocean dilution (D_m) is reduced due to the higher overall discharge flow (*i.e.*, compared to Scenarios 2 and 3). The Davidson ocean condition was used as it represents the worst-case dilution for this flow scenario.

[15] Note that this scenario would only apply if wastewater flows increased to the point that MRWPCA took action to open the 42 discharge ports that are currently closed. Scenario 2 is the maximum discharge flow under the current port configuration.

[16] For Scenarios 2 through 5, ocean modeling was performed assuming 120 ports open, which would yield more conservative D_m values than 130 ports, as dilution increases with increasing numbers of open ports.

Table 4.11-19
Flow Scenarios and Modeled D_m Values used for Ocean Plan Compliance Analysis

No.	Discharge Scenario (Ocean Condition)	Flows (mgd)			D_m
		Secondary effluent	Reverse Osmosis Concentrate	Hauled brine	
1	Regional Treatment Plant Design Capacity (Oceanic)	24.7	0.94	0.1	150
2	Regional Treatment Plant Capacity with Current Port Configuration (Oceanic)	23.7	0.94	0.1	137
3	Minimum Wastewater Flow (Oceanic)	0	0.94	0.1	523
4	Minimum Wastewater Flow (Davidson)	0.4	0.94	0.1	285
5	Moderate Wastewater Flow Condition (Davidson)	3	0.94	0.1	201

Ocean Plan Compliance Results

The flow-weighted in-pipe concentration for each constituent was calculated for each discharge scenario using the water quality presented in **Table 4.11-18** and the flows presented in **Table 4.11-19.** The in-pipe concentration was then used to calculate the concentration at the edge of the ZID using the D_m values presented in **Table 4.11-19**. The resulting concentrations at the edge of the ZID for each constituent in each scenario were compared to the Ocean Plan objective to assess compliance. The estimated concentrations for all five flow-scenarios are presented as concentrations at the edge of the ZID in **Table 4.11-20** and as a percentage of the Ocean Plan objective in **Table 4.11-21.** As shown, none of the constituents are expected to exceed 80% of their Ocean Plan objective[17].

Table 4.11-20
Predicted Concentrations of Ocean Plan Constituents at the Edge of the ZID

Constituent	Units	Ocean Plan Objective	Predicted concentrations of Ocean Plan constituents at the Edge of ZID by Discharge Scenario				
			1	2	3	4	5
Objectives for protection of marine aquatic life							
Arsenic	ug/L	8	3.3	3.3	3.0	3.1	3.2
Cadmium	ug/L	1	0.009	0.01	0.01	0.02	0.01
Chromium (Hexavalent)	ug/L	2	0.02	0.03	0.05	0.07	0.04
Copper	ug/L	3	2.2	2.2	2.2	2.3	2.2
Lead	ug/L	2	0.006	0.007	0.008	0.011	0.008
Mercury	ug/L	0.04	0.006	0.006	0.006	0.006	0.006
Nickel	ug/L	5	0.1	0.1	0.1	0.2	0.1
Selenium	ug/L	15	0.05	0.06	0.07	0.10	0.07
Silver	ug/L	0.7	<0.17	<0.17	<0.16	<0.16	<0.17
Zinc	ug/L	20	8.3	8.3	8.4	8.6	8.4
Cyanide (MBAS data)	ug/L	1	0.61	0.66	0.26	0.44	0.50
Cyanide	ug/L	1	0.056	0.062	0.074	0.105	0.076
Total Chlorine Residual	ug/L	2	<1.3	<1.4	<0.4	<0.7	<1.0
Ammonia (as N) - 6-mo median	ug/L	600	279	306	337	481	359

[17] Aldrin, benzidine, 3,3-dichlorobenzidine, and heptachlor were not detected in any source waters, however their MRLs are greater than the Ocean Plan objective. Therefore, no percentages are presented Table 4 as no compliance conclusions can be drawn for these constituents. This is a typical occurrence for ocean discharges since the MRL is higher than the ocean plan objective for some constituents.

Table 4.11-20
Predicted Concentrations of Ocean Plan Constituents at the Edge of the ZID

Constituent	Units	Ocean Plan Objective	Predicted concentrations of Ocean Plan constituents at the Edge of ZID by Discharge Scenario				
			1	2	3	4	5
Ammonia (as N) - Daily Max	ug/L	2,400	375	413	454	648	483
Acute Toxicity[a]	TUa	0.3					
Chronic Toxicity[a]	TUc	1					
Phenolic Compounds (non-chlorinated)	ug/L	30	0.53	0.58	0.64	0.91	0.68
Chlorinated Phenolics	ug/L	1	<0.13	<0.14	<0.04	<0.07	<0.10
Endosulfan	ug/L	0.009	0.00037	0.00040	0.00045	0.00064	0.00047
Endrin	ug/L	0.002	6.0E-07	6.7E-07	7.3E-07	1.0E-06	7.8E-07
HCH (Hexachlorocyclohexane)	ug/L	0.004	0.00046	0.00050	0.00055	0.00079	0.00059
Radioactivity (Gross Beta)[a]	pci/L	0.0					
Radioactivity (Gross Alpha)[a]	pci/L	0.0					
Objectives for protection of human health - non-carcinogens							
Acrolein	ug/L	220	0.07	0.08	0.08	0.1	0.09
Antimony	ug/L	1200	0.0060	0.0066	0.0073	0.010	0.0078
Bis (2-chloroethoxy) methane	ug/L	4.4	<0.03	<0.03	<0.002	<0.007	<0.02
Bis (2-chloroisopropyl) ether	ug/L	1200	<0.03	<0.03	<0.002	<0.007	<0.02
Chlorobenzene	ug/L	570	<0.003	<0.004	<0.001	<0.002	<0.002
Chromium (III)	ug/L	190000	0.058	0.064	0.082	0.116	0.082
Di-n-butyl phthalate	ug/L	3500	<0.04	<0.05	<0.003	<0.01	<0.03
Dichlorobenzenes	ug/L	5100	0.01	0.01	0.01	0.02	0.02
Diethyl phthalate	ug/L	33000	<0.03	<0.04	<0.003	<0.008	<0.02
Dimethyl phthalate	ug/L	820000	<0.01	<0.01	<0.001	<0.004	<0.008
4,6-dinitro-2-methylphenol	ug/L	220	<0.1	<0.1	<0.01	<0.04	<0.08
2,4-Dinitrophenol	ug/L	4.0	<0.08	<0.09	<0.01	<0.03	<0.06
Ethylbenzene	ug/L	4100	<0.003	<0.004	<0.001	<0.002	<0.002
Fluoranthene	ug/L	15	<0.003	<0.004	<0.0003	<0.001	<0.002
Hexachlorocyclopentadiene	ug/L	58	<0.003	<0.003	<0.0002	<0.001	<0.002
Nitrobenzene	ug/L	4.9	<0.01	<0.02	<0.002	<0.005	<0.01
Thallium	ug/L	2	0.005	0.006	0.006	0.009	0.007
Toluene	ug/L	85000	<0.003	<0.004	<0.001	<0.002	<0.002
Tributyltin	ug/L	0.0014	<0.0003	<0.0004	<0.00004	<0.0001	<0.0002
1,1,1-Trichloroethane	ug/L	540000	<0.003	<0.004	<0.001	<0.002	<0.002
Objectives for protection of human health - carcinogens							
Acrylonitrile	ug/L	0.10	0.02	0.02	0.02	0.03	0.03
Aldrin[b]	ug/L	0.000022	<0.00005	<0.00005	<0.00002	<0.00003	<0.00004
Benzene	ug/L	5.9	<0.003	<0.004	<0.001	<0.002	<0.002
Benzidine[b]	ug/L	0.000069	<0.1	<0.1	<0.004	<0.02	<0.08
Beryllium	ug/L	0.033	0.005	0.005	0.001	0.002	0.003
Bis(2-chloroethyl)ether	ug/L	0.045	<0.03	<0.03	<0.002	<0.007	<0.02
Bis(2-ethyl-hexyl)phthalate	ug/L	3.5	0.60	0.66	0.72	1.03	0.77
Carbon tetrachloride	ug/L	0.90	0.004	0.004	0.005	0.007	0.005
Chlordane	ug/L	0.000023	5.6E-06	6.2E-06	6.8E-06	9.7E-06	7.2E-06
Chlorodibromomethane	ug/L	8.6	0.02	0.02	0.02	0.03	0.02
Chloroform	ug/L	130	0.3	0.3	0.4	0.5	0.4
DDT	ug/L	0.00017	1.6E-05	1.8E-05	6.4E-05	1.1E-04	4.7E-05
1,4-Dichlorobenzene	ug/L	18	0.01	0.01	0.01	0.02	0.02
3,3-Dichlorobenzidine[b]	ug/L	0.0081	<0.1	<0.1	<0.01	<0.03	<0.1
1,2-Dichloroethane	ug/L	28	<0.003	<0.004	<0.001	<0.002	<0.002
1,1-Dichloroethylene	ug/L	0.9	0.003	0.004	0.001	0.002	0.002
Dichlorobromomethane	ug/L	6.2	0.02	0.02	0.02	0.03	0.03
Dichloromethane (methylenechloride)	ug/L	450	0.005	0.01	0.01	0.01	0.01
1,3-dichloropropene	ug/L	8.9	0.004	0.005	0.01	0.01	0.01

Table 4.11-20
Predicted Concentrations of Ocean Plan Constituents at the Edge of the ZID

Constituent	Units	Ocean Plan Objective	Predicted concentrations of Ocean Plan constituents at the Edge of ZID by Discharge Scenario				
			1	2	3	4	5
Dieldrin	ug/L	0.00004	4.0E-06	4.5E-06	6.1E-06	1.3E-05	5.9E-06
2,4-Dinitrotoluene	ug/L	2.6	<0.01	<0.01	<0.001	<0.003	<0.01
1,2-Diphenylhydrazine (azobenzene)	ug/L	0.16	<0.03	<0.03	<0.002	<0.01	<0.02
Halomethanes	ug/L	130	0.011	0.012	0.013	0.019	0.014
Heptachlor[b]	ug/L	0.00005	<0.0001	<0.0001	<0.00002	<0.00003	<0.00005
Heptachlor Epoxide	ug/L	0.00002	4.5E-07	5.0E-07	5.5E-07	7.8E-07	5.8E-07
Hexachlorobenzene	ug/L	0.00021	6.0E-07	6.6E-07	7.2E-07	1.0E-06	7.7E-07
Hexachlorobutadiene	ug/L	14	6.9E-08	7.6E-08	8.3E-08	1.2E-07	8.9E-08
Hexachloroethane	ug/L	2.5	<0.01	<0.02	<0.001	<0.004	<0.01
Isophorone	ug/L	730	<0.003	<0.004	<0.001	<0.002	<0.002
N-Nitrosodimethylamine	ug/L	7.3	0.001	0.001	0.0003	0.0005	0.001
N-Nitrosodi-N-Propylamine	ug/L	0.38	0.0005	0.001	0.00005	0.0001	0.0003
N-Nitrosodiphenylamine	ug/L	2.5	<0.01	<0.02	<0.002	<0.01	<0.01
PAHs	ug/L	0.0088	0.00041	0.00045	0.00049	0.00070	0.00052
PCBs	ug/L	0.000019	5.20E-06	5.72E-06	6.29E-06	8.98E-06	6.70E-06
TCDD Equivalents	ug/L	3.9E-09	1.18E-09	1.30E-09	1.42E-09	2.03E-09	1.52E-09
1,1,2,2-Tetrachloroethane	ug/L	2.3	<0.003	<0.004	<0.001	<0.002	<0.002
Tetrachloroethylene	ug/L	2.0	<0.003	<0.004	<0.001	<0.002	<0.002
Toxaphene	ug/L	2.1E-04	5.43E-05	5.97E-05	6.57E-05	9.38E-05	6.99E-05
Trichloroethylene	ug/L	27	<0.003	<0.004	<0.001	<0.002	<0.002
1,1,2-Trichloroethane	ug/L	9.4	<0.003	<0.004	<0.001	<0.002	<0.002
2,4,6-Trichlorophenol	ug/L	0.29	<0.01	<0.02	<0.002	<0.01	<0.01
Vinyl chloride	ug/L	36	<0.003	<0.004	<0.001	<0.002	<0.002

[a] Calculating flow-weighted averages for toxicity (acute and chronic) and radioactivity (gross beta and gross alpha) is not appropriate based the nature of the constituent. These constituents were measured individually for the secondary effluent and reverse osmosis concentrate, and these individual concentrations would comply with the Ocean Plan objectives.
[b] All observed values from all data sources were below the MRL, and the flow-weighted average of the MRLs is higher than the Ocean Plan objective. No compliance conclusions can be drawn for these constituents.

Table 4.11-21
Predicted Concentrations of all Ocean Plan Constituents, Expressed as Percent of Ocean Plan Objective

Constituent	Units	Ocean Plan Objective	Estimated Percentage of Ocean Plan Objective at the Edge of ZID by Discharge Scenario [c]				
			1	2	3	4	5
Objectives for protection of marine aquatic life							
Arsenic	ug/L	8	41%	41%	38%	38%	40%
Cadmium	ug/L	1	1%	1%	1%	2%	1%
Chromium (Hexavalent)	ug/L	2	1%	1%	2%	3%	2%
Copper	ug/L	3	73%	73%	75%	78%	75%
Lead	ug/L	2	0.3%	0.3%	0.4%	0.5%	0.4%
Mercury	ug/L	0.04	14%	14%	15%	16%	15%
Nickel	ug/L	5	2%	2%	2%	3%	3%
Selenium	ug/L	15	0.3%	0.4%	0.5%	0.7%	0.5%
Silver	ug/L	0.7	<24%	<24%	<23%	<23%	<24%
Zinc	ug/L	20	42%	42%	42%	43%	42%
Cyanide (MBAS data)	ug/L	1	61%	66%	26%	44%	50%
Cyanide	ug/L	1	6%	6%	7%	10%	8%
Total Chlorine Residual	ug/L	2	–	–	–	–	–
Ammonia (as N) - 6-mo median	ug/L	600	46%	51%	56%	80%	60%
Ammonia (as N) - Daily Max	ug/L	2,400	16%	17%	19%	27%	20%
Acute Toxicity[a]	TUa	0.3					
Chronic Toxicity[a]	TUc	1					
Phenolic Compounds (non-chlorinated)	ug/L	30	2%	2%	2%	3%	2%
Chlorinated Phenolics	ug/L	1	<13%	<14%	<4%	<7%	<10%
Endosulfan	ug/L	0.009	4%	4%	5%	7%	5%
Endrin	ug/L	0.002	0.03%	0.03%	0.04%	0.05%	0.04%
HCH (Hexachlorocyclohexane)	ug/L	0.004	11%	13%	14%	20%	15%
Radioactivity (Gross Beta)[a]	pci/L	0.0					
Radioactivity (Gross Alpha)[a]	pci/L	0.0					
Objectives for protection of human health - noncarcinogens							
Acrolein	ug/L	220	0.03%	0.03%	0.04%	0.05%	0.04%
Antimony	ug/L	1200	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Bis (2-chloroethoxy) methane	ug/L	4.4	<0.61%	<0.67%	<0.06%	<0.17%	<0.39%
Bis (2-chloroisopropyl) ether	ug/L	1200	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Chlorobenzene	ug/L	570	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Chromium (III)	ug/L	190000	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Di-n-butyl phthalate	ug/L	3500	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Dichlorobenzenes	ug/L	5100	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Diethyl phthalate	ug/L	33000	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Dimethyl phthalate	ug/L	820000	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
4,6-dinitro-2-methylphenol	ug/L	220	<0.06%	<0.06%	<0.01%	<0.02%	<0.04%
2,4-Dinitrophenol	ug/L	4.0	<2.10%	<2.30%	<0.28%	<0.68%	<1.38%
Ethylbenzene	ug/L	4100	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Fluoranthene	ug/L	15	<0.02%	<0.02%	<0.01%	<0.01%	<0.01%
Hexachlorocyclopentadiene	ug/L	58	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Nitrobenzene	ug/L	4.9	<0.30%	<0.33%	<0.04%	<0.10%	<0.20%
Thallium	ug/L	2	0.27%	0.29%	0.32%	0.46%	0.34%
Toluene	ug/L	85000	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Tributyltin	ug/L	0.0014	<23%	<25%	<3%	<8%	<15%
1,1,1-Trichloroethane	ug/L	540000	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Objectives for protection of human health - carcinogens							
Acrylonitrile	ug/L	0.10	20%	21%	24%	34%	25%
Aldrin[b]	ug/L	0.000022	–	–	–	–	–
Benzene	ug/L	5.9	<0.06%	<0.06%	<0.02%	<0.03%	<0.04%

Table 4.11-21
Predicted Concentrations of all Ocean Plan Constituents, Expressed as Percent of Ocean Plan Objective

Constituent	Units	Ocean Plan Objective	Estimated Percentage of Ocean Plan Objective at the Edge of ZID by Discharge Scenario [c]				
			1	2	3	4	5
Benzidine[b]	ug/L	0.000069	–	–	–	–	–
Beryllium	ug/L	0.033	14%	15%	3%	5%	9%
Bis(2-chloroethyl)ether	ug/L	0.045	<60%	<66%	<6%	<16%	<38%
Bis(2-ethyl-hexyl)phthalate	ug/L	3.5	17%	19%	21%	29%	22%
Carbon tetrachloride	ug/L	0.90	0.4%	0.5%	0.5%	0.7%	0.6%
Chlordane	ug/L	0.000023	24%	27%	30%	42%	32%
Chlorodibromomethane	ug/L	8.6	0.2%	0.2%	0.3%	0.4%	0.3%
Chloroform	ug/L	130	0.2%	0.3%	0.3%	0.4%	0.3%
DDT	ug/L	0.00017	9%	10%	37%	62%	27%
1,4-Dichlorobenzene	ug/L	18	0.1%	0.1%	0.1%	0.1%	0.1%
3,3-Dichlorobenzidine[b]	ug/L	0.0081	–	–	–	–	–
1,2-Dichloroethane	ug/L	28	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
1,1-Dichloroethylene	ug/L	0.9	0.4%	0.4%	0.1%	0.2%	0.3%
Dichlorobromomethane	ug/L	6.2	0.3%	0.4%	0.4%	0.6%	0.4%
Dichloromethane (methylenechloride)	ug/L	450	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
1,3-dichloropropene	ug/L	8.9	0.05%	0.05%	0.06%	0.08%	0.06%
Dieldrin	ug/L	0.00004	10%	11%	15%	34%	15%
2,4-Dinitrotoluene	ug/L	2.6	<0.5%	<0.5%	<0.02%	<0.1%	<0.3%
1,2-Diphenylhydrazine (azobenzene)	ug/L	0.16	<17%	<18%	<2%	<5%	<11%
Halomethanes	ug/L	130	0.01%	0.01%	0.01%	0.01%	0.01%
Heptachlor[b]	ug/L	0.00005	–	–	<38%	<70%	–
Heptachlor Epoxide	ug/L	0.00002	2%	2%	3%	4%	3%
Hexachlorobenzene	ug/L	0.00021	0.3%	0.3%	0.3%	0.5%	0.4%
Hexachlorobutadiene	ug/L	14	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Hexachloroethane	ug/L	2.5	<0.6%	<0.6%	<0.1%	<0.2%	<0.4%
Isophorone	ug/L	730	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
N-Nitrosodimethylamine	ug/L	7.3	0.01%	0.01%	<0.01%	0.01%	0.01%
N-Nitrosodi-N-Propylamine	ug/L	0.38	0.13%	0.14%	0.01%	0.04%	0.08%
N-Nitrosodiphenylamine	ug/L	2.5	<0.6%	<0.7%	<0.1%	<0.2%	<0.4%
PAHs	ug/L	0.0088	5%	5%	6%	8%	6%
PCBs	ug/L	0.000019	27%	30%	33%	47%	35%
TCDD Equivalents	ug/L	3.9E-09	30%	33%	37%	52%	39%
1,1,2,2-Tetrachloroethane	ug/L	2.3	<0.1%	<0.2%	<0.04%	<0.1%	<0.1%
Tetrachloroethylene	ug/L	2.0	<0.2%	<0.2%	<0.05%	<0.1%	<0.1%
Toxaphene	ug/L	2.1E-04	26%	28%	31%	45%	33%
Trichloroethylene	ug/L	27	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
1,1,2-Trichloroethane	ug/L	9.4	<0.04%	<0.04%	<0.01%	<0.02%	<0.03%
2,4,6-Trichlorophenol	ug/L	0.29	<5%	<6%	<1%	<2%	<3%
Vinyl chloride	ug/L	36	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%

[a] Calculating flow-weighted averages for toxicity (acute and chronic) and radioactivity (gross beta and gross alpha) is not appropriate based the nature of the constituent. These constituents were measured individually for the secondary effluent and reverse osmosis concentrate, and these individual concentrations would comply with the Ocean Plan objectives.

[b] All observed values from all data sources were below the MRL, and the flow-weighted average of the MRLs is higher than the Ocean Plan objective. No compliance conclusions can be drawn for these constituents.

[c] Note that if the percentage as determined by using the MRL was less than 0.01 percent, then a minimum value is shown as "<0.01%" (*e.g.*, if the MRL indicated the value was <0.000001%, for simplicity, it is displayed as <0.01%).

All Other Project Components

None of the other project components have the potential to adversely affect marine water quality; in fact, beneficial impacts to marine water quality are anticipated as described in Impact HS-4, above.

Impact Conclusions

The Proposed Project would comply with the Ocean Plan objectives established to protect marine life and human health. Trussell Tech used a conservative approach to estimate the water qualities of the Regional Treatment Plant secondary effluent, reverse osmosis concentrate, and hauled brine waste for the Proposed Project. These water quality data were then combined for various discharge scenarios, and a concentration at the edge of the ZID was calculated for each constituent and scenario. Compliance assessments could not be made for selected constituents, as noted, due to analytical limitations, but this is a typical occurrence for these Ocean Plan constituents. Based on the data, assumptions, modeling, and analytical methodology presented in the Trussell Tech technical memorandum, the Proposed Project would comply with the Ocean Plan objectives and the Proposed Project would have a less-than-significant impact on water quality in the Monterey Bay and Pacific Ocean.

In the larger Monterey Bay and Pacific Ocean, the Proposed Project would provide a beneficial impact due to pollutant load reductions that would occur due to diversions of waters of marginal quality to the Regional Treatment Plant for treatment and disposal. A portion of the pollutants in the new source waters would be removed from the wastewater streams through the treatment processes (sedimentation and filtration prior to the reverse osmosis system) and disposed as solids to the adjacent landfill where they would no longer adversely affect surface water quality. Those pollutants removed would no longer be discharged to the environment and thus, the water quality in the Salinas River Lagoon, Moss Landing Harbor/Elkhorn Slough, and the Monterey Bay/Pacific Ocean would be improved.

Impact HS-6: Operational Drainage Pattern Alterations. The Proposed Project would alter existing drainage patterns of the component sites by increasing impervious surfaces, but would not substantially increase the rate or amount of runoff such that it would: (1) cause erosion or siltation on- or off-site, (2) cause flooding on- or offsite, or (3) exceed the existing storm drainage system capacity. (Criteria b, c, and d) (Less than Significant)

Source Water Storage and Diversion Sites

All of the proposed Source Water Storage and Diversion sites that increase impervious surfaces have the potential to alter drainage patterns and increase in stormwater runoff. The Proposed Project would be subject to the post-construction stormwater management requirements of the applicable municipal stormwater permit, General Construction Stormwater Permit, and other WDRs that require projects to implement post-construction stormwater BMPs (and low impact development measures) into the final site designs and construction.

New diversion structures, pipelines, and pump stations would be constructed in primarily unpaved areas for the various source water diversion and storage sites; however, only approximately 200 square feet of new impervious surfaces for pump stations and diversion structure pads would be added at the diversion sites (not including pipelines). In all cases, the surrounding areas would remain unpaved and rainwater falling on the facilities would be allowed to infiltrate into the ground in accordance with State and local permits. Rainwater would sheet flow onsite to unpaved areas. Therefore, the additional impervious surfaces to be added at the Source Water Storage and Diversion sites would have a less-than-significant impact relative to alteration of drainage patterns and increased runoff.

Treatment Facilities at the Regional Treatment Plant

The proposed Treatment Facilities at the Regional Treatment Plant (including the AWT Facility and the Salinas Valley Reclamation Plant modifications) would include structures that would result in the construction of about 3.5 acres of new impervious surfaces that would restrict rainfall from infiltrating into the subsurface, altering drainage patterns and potentially increasing runoff. However, rainwater falling on these structures would be routed to the unpaved surrounding area that will remain unpaved. Design plans include on-site retention of storm water (see **Figure 2-27**); rainwater would be disposed to an on-site stormwater retention basin with appropriate energy dissipation (i.e., rock rip-rap) in accordance with State and local permits. Therefore, the additional impervious surfaces for the Treatment Facilities at the Regional Treatment Plant would not cause erosion or siltation on- or off-site, cause flooding on- or offsite, or exceed the existing storm drainage system capacity, and therefore, would have a less-than-significant impact due to alteration of drainage patterns or creating runoff.

Product Water Conveyance System Pipelines and Pump Station

The Product Water Conveyance pipelines would be constructed mostly within existing paved rights of-way and would disturb a relatively narrow width of land (10 to 15 feet) in unpaved areas. The areas of ground surface disturbance would be restored to pre-construction conditions. Therefore, the pipelines would not substantially alter drainage patterns or create substantial runoff. Upon completion of construction, the pipelines would not cause erosion or siltation on- or off-site, cause flooding on- or offsite, or exceed the existing storm drainage system capacity. Therefore, the Product Water Conveyance pipelines would have a less-than-significant impact due to alteration of drainage patterns or creating runoff.

The 2,000-square-foot Booster Pump Station would be built on one of two optional sites (depending on the pipe alignment selected), the RUWAP and the Coastal. For the RUWAP site, the new facilities would be located on an existing paved site, resulting in no new or additional impervious surfaces. For the Coastal site, the new pump station would be constructed in an unpaved area. The surrounding area would remain unpaved, providing a route for rainwater falling on the pump station to infiltrate back into the ground including energy dissipation. Design plans include on-site retention of storm water (see **Figure 2-31**); therefore, rainwater would be disposed to an on-site stormwater retention basin with appropriate energy dissipation (i.e., rock rip-rap). In both cases, the Booster Pump Station would not substantially alter drainage patterns or create substantial runoff. Upon completion of construction, the Booster Pump Station would not cause erosion or siltation on- or off-site, cause flooding on- or offsite, or exceed the existing storm drainage system capacity. Therefore, the Product Water Conveyance pipelines and Booster Pump Station (both alignment options) would have a less-than-significant impact due to alteration of drainage patterns or creating runoff.

Injection Well Facilities

Each well cluster would include electrical and motor control systems that would be housed in an approximately 400 square-foot building. The addition of the four buildings and surrounding parking and concrete/asphalt area would result in the addition of impervious surfaces. The new well clusters at the Injection Well Facilities site are proposed to be located on existing unpaved areas that would be paved under the Proposed Project. In addition, a paved driveway would be constructed to provide vehicular access to each site. The surrounding area would remain unpaved providing a route for rainwater falling on the pavement to infiltrate back into the ground. Design plans include on-site retention of storm water (see **Figure 2-35**); therefore, rainwater would remain on-site through percolation back to the groundwater basin. Based on this information, the new impervious surfaces would not substantially alter drainage patterns or create substantial runoff. Upon completion of construction, the Injection Well Facilities would not cause erosion or siltation on- or off-site, cause flooding on- or offsite, or exceed the existing storm drainage system capacity. Therefore, the Injection Well Facilities would have a less-than-significant impact due to alteration of drainage patterns or creating runoff.

CalAm Distribution System Pipelines

The CalAm Distribution System pipelines would be constructed mostly within existing paved rights-of way and would disturb a relatively narrow width of land (10 to 15 feet). Therefore the pipelines would not substantially alter drainage patterns or create substantial runoff. Upon completion of construction, the pipelines would not cause erosion or siltation on- or off-site, cause flooding on- or offsite, or exceed the existing storm drainage system capacity. Therefore, the CalAm Distribution System pipelines would have a less-than-significant impact due to alteration of drainage patterns or creating runoff.

Impact Conclusion

The Proposed Project would be subject to the post-construction stormwater management requirements of the state and local permits and the project proponent and its contractors would be required to implement post-construction stormwater BMPs in site designs and construction. With adherence to the post-construction requirements, the Proposed Project would result in a less-than-significant impact associated with new impervious surfaces resulting in alteration of drainage patterns or creation of substantial runoff and no mitigation measures would be required.

Impact HS-7: <u>Operational Carmel River Flows</u>. Proposed Project operations would result in reduced pumping of the Carmel River alluvial aquifer resulting in increased flows in Carmel River that would benefit habitat for aquatic and terrestrial species. (Criteria b, c, and d) (Beneficial)

All Project Components

The primary objective of the Proposed Project is to provide replacement water to California American Water Company (CalAm) thereby enabling CalAm to reduce its diversions from the Carmel River system by this same amount. Reduction of diversions in the Carmel River would have a beneficial impact on river flows (including fisheries and other aquatic and terrestrial habitat and species that benefit from the Carmel River flows). The Proposed Project would have net beneficial effects on special-status species and sensitive habitats in the Carmel River system. As described in **Chapter 2, Project Description** (see **Section 2.3.2.4)**, the State Water Resources Control Board has required CalAm to find a new source of water to replace diversions over and above the entitled 3,376 acre-feet per year (AFY) from the Carmel River and reduce pumping from the river by 20% from historic levels (SWRCB, 1995b). The Proposed Project would assist CalAm in meeting the requirements of the State Board. Project implementation would reduce pumping of river sub-flows from the Carmel River by 3,500 AFY compared to existing conditions thus returning equivalent amount of flows to the Carmel River.

Reducing diversions of river water would result in associated benefits to habitat and improved conditions for aquatic and terrestrial species; see discussion of fisheries benefits in **Section 4.4, Biological Resource: Fisheries** and benefits to other terrestrial and aquatic species and habitat in **Section 4.5, Biological Resource: Terrestrial**, including stability/health of the riparian corridor. The CalAm diversions would be reduced by 3,500 AFY because the Proposed Project includes improvements that would enable CalAm Monterey District main system to deliver the new supplies of extracted groundwater to customers. The average CalAm water production from the Carmel River system (for the last nine completed water years) was 8,995 AFY as shown in **Table 2-8** in **Chapter 2, Project Description**. The Proposed Project would reduce Carmel River extractions to 5,489 AFY.[18] Although the habitat and stability/health of the riparian corridor would be improved, resulting increased flows in the river could be a significant impact if the flows would cause adverse effects such as flooding and/or stream bank instability; therefore, these issues are address in the following sections.

Flooding

Under existing conditions, flooding along the lower Carmel River occurs during significant storm events. Flooding of low-lying properties and some structures along the lower Carmel River can begin when flow in the river exceeds 7,000 cfs at Carmel Valley village. The estimated peak 100-year event flows is 22,700 cfs at the USGS gaging station (River Mile 3.2[19]). A flow of approximately 9,500 cfs is considered close to a 10-year event. Historically, most of the losses from flooding recorded by Monterey County were estimated to result from storm events in 1995 and 1998. These storms were

A reduction in CalAm diversions of Carmel River water would have no noticeable impact on river flows and associated flooding during significant storm events. The maximum instantaneous pumping capacity of CalAm wells reported in the lower reach of the Carmel River is approximately 33 cfs, which represents approximately 0.15% of the estimated peak flow in a 100-year flood (Hampson, 2008). Based on these considerations, reduced CalAm River diversions would not affect the magnitude of peak flood flows.

Stream Bank Stability/Erosion/Water Quality

Under existing conditions, the lower reach of the Carmel River is a potentially unstable system that varies between a narrow, stable channel and a wide shifting channel. CalAm diversions have led to a loss of continuous corridors of healthy riparian habitat, which has exposed some of the stream banks to erosive forces during winter flows. (Hampson, 2008).

Streamside vegetation depends directly on access to adequate levels of surface and groundwater to become established and to maintain its health and vigor. Diversions along the river during the low flow season reduce the amount of water available to sustain healthy streamside vegetation and can result in reduced vigor and/or mortality and loss of diversity of the vegetation (Hampson, 2008).

Reducing CalAm Carmel River diversions would help in restoring the streamside vegetation (Hampson, 2008). Therefore, the impact from increased flows in the Carmel River, on stream erosion, bank stability, and water quality would be beneficial.

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[18] The average water production from the Carmel River system (for the last five completed water years) was 7,817 AFY as shown in **Table 2-8** in **Chapter 2, Project Description**. Using this average, the Proposed Project would reduce Carmel River extractions to 4,317 AFY.
[19] River miles are measured upstream from the mouth of a river.

Impact HS-8: Operational Risks due to Location within 100-Year Flood Area. Portions of the Proposed Project would be located within a 100-year flood hazard area but would not impede or redirect flood flows. (Criterion g) (Less than Significant)

All Proposed Project Components

The Source Water Diversion and Storage sites within the Salinas Valley would be located in the 100-year flood hazard area associated with the Salinas River and Reclamation Ditch watersheds. Some small portions of the proposed Product Water Conveyance pipelines (both the Coastal and RUWAP alignments) would cross through small localized flood areas, but would be located entirely underground. The Treatment Facilities at the Regional Treatment Plant and the Injection Well Facilities would not be located within a 100-year flood hazard area. In the City of Monterey near Del Monte Beach, the Lake El Estero Diversion site and the CalAm Distribution System: Monterey Pipeline would be located within a 100-year flood hazard area but would also both be located entirely underground. Design of the project components would take these hazards into consideration. Damage to, temporary inundation of, or temporary exposure of the proposed new water supply infrastructure due to flooding or tsunami is not expected to result in a significant risk of loss of life or property as documented further below (Ninyo & Moore, 2014).

Table 2-20 in **Chapter 2, Project Description**, provides the permanent footprint and maximum height of new above-ground facilities for the Proposed Project components located in areas designated as 100-year flood hazard areas. The following discusses the physical facilities and associated risks for those facilities proposed to be located in a 100-year flood hazard area:

The proposed Salinas Pump Station Diversion site would be below ground therefore would not impede or redirect flood flows. In addition, this component would not pose a significant risk of loss or injury to structures because only new wet wells, pipelines and valves would be built at the site and thus, this component would not be substantially harmed due to temporary inundation by a storm event. In addition, this component would not pose a significant risk of loss injury, or death to people because the facilities are controlled by automated systems and no new permanent employees would be working at the site.

The proposed Salinas Treatment Facility Storage and Recovery component site, except the aeration lagoon, are located within FEMA 100-year flood zone that is associated with potential flooding on the Salinas River. Floodplain AE is defined as the base flood plain where flood plain elevations are provided and there is a 1% chance of expecting a flood each year. Two below-ground pumps with elevated electrical controls (i.e., small boxes located up to 10 feet above ground) would be built; however the electrical controls would be so small as to avoid impacts of impeding or redirecting flood flows and would not necessitate the need to revise the flood maps. (Schaaf & Wheeler, 2015a) The ponds themselves would potentially be damaged by flood flows and thus the City and/or others that may be using the ponds at the time may be required to rebuild or reconstruct all or part of the Salinas Treatment Facility in the event of a 100-year flood.

The proposed Reclamation Ditch and Tembladero Slough Diversions would be new physical facilities within the channel of the man-made drainage ditches. The proposed project components would increase impervious areas by a small amount (less than 1,000 square feet each) at the Davis Road and Castroville sites. The Proposed Project would not substantially alter the existing drainage patterns of any of the proposed project sites and would not resulting in any changes to flooding conditions on- or off-site by impeding or redirecting flood flows. The proposed diversion pump stations at Davis Road and Castroville would include inlet structures in the channel bottom. These inlets must include a screen to exclude fish and trash, and must be configured to not alter the conveyance capacity of the Reclamation Ditch and Tembladero Slough. Above-ground structures on the channel bank would be located within a 100-year flood hazard area, but will not impede or reduce flood flows because they are relatively small (less than 100 square feet and up to ten feet tall) and would be located at sites that currently contain other above-ground structures of much larger size and profile, most notably the roadway bridge abutments immediately upstream. These components would not necessitate the need to revise the flood maps (Schaaf & Wheeler, 2015b).

The proposed Blanco Drain Diversion (including the pump station and pipeline) would be located in the 100-year flood hazard area. The new pump station would not alter the channel cross-section, nor the conveyance capacity of the Blanco Drain. The pump station would not impede or reduce flood flows because they are low profile (less than five feet above ground)[20] and small in surface area (less than 500 square-feet of vertical structures). The Blanco Drain Diversion pump station would be located at a site that currently contains similarly sized above-ground structures. This component would not necessitate the need to revise the flood maps.

Impact Conclusion

No habitable structures or above-ground structures that would impede or redirect flood flows would be constructed within any 100-year flood hazard zones. The project would not place habitable structures in a 100-year flood zone, create above-ground structures that could impede or redirect flood flows, or expose new structures or people to significant risks of loss, injury or death related to inundation by floods. Therefore, the Proposed Project would have a less-than-significant impact related to flood risks associated with the siting of facilities within a 100-year flood hazard area and no mitigation measures would be required.

Impact HS-9: <u>Operational Risks due to Flooding due to Levee/Dam Failure, or Coastal Inundation</u>. During operations, some Proposed Project facilities may be exposed to flooding due to failure of a levee or dam, sea level rise, and storm surges/tides related to climate change, but this exposure would not pose a substantial nor significant risk of loss, injury, or death. (Criterion h) (Less than Significant)

All Proposed Project Components – Flooding due to Levee/Dam Failure

There are no levees within the hydrology and water quality study area or near Proposed Project components. Dams that are located in the Proposed Project study area include Nacimiento and San Antonio Dams in the Salinas River Watershed. In the unlikely event of failure of a dam, the downstream areas that would be in the path of the flood flows would be confined to the 500-year floodplain of the Salinas River. The Proposed Project facilities within that area are the Salinas Pump Station, Salinas Treatment Facility Storage and Recovery, Tembladero Slough, and Blanco Drain Diversion sites. However, these component sites are not at risk of loss due to inundation because they would only include diversion structures, wet wells, pumps, and pipelines that would not be damaged by temporary inundation, with the exception of electrical automation controls (SCADA). Therefore, the Proposed Project would not expose people or structures to substantial risk

[20] Note: Electrical controls would be elevated up to 10-feet above ground in a small control box, and would be so small as to avoid impacts of impeding or redirecting flood flows

from flooding related to a dam failure. The Proposed Project would have a less-than-significant impact associated with potential flooding from levee or dam failure. Proposed Project changes to runoff and drainage and other changes to flow in surface water bodies that may expose people or structures to flooding are addressed in more detail previously in Impacts HS-6, HS-7, and HS- 8. Proposed Project impacts related to inundation by seiche, tsunami and mudflow are addressed in HS-10.

Sea Level Rise and Storm Surges/Tides Related to Climate Change

The analysis of sea level rise in the project area used a projection of 15 inches by 2040 and 28 inches by 2060, relative to existing conditions in 2010. These projections are based on a 2012 study by the National Research Council. As sea level rises, higher mean sea level will make it possible for wave run-up to reach the dune more frequently, undercutting at the dune toe and causing increased erosion (ESA/PWA, 2014).

Sea level rise impacts were analyzed based on a Technical Memorandum prepared by ESA PWA for the Monterey Peninsula Water Supply Project (ESA/PWA, 2014). This analysis evaluated historic shoreline change trends in order to project future erosion. Shoreline change data was compiled from a variety of sources. Sand mining operations and rip embayments were included in the analysis as significant factors affecting shoreline change. Future erosion was analyzed at six locations within the Proposed Project area. Coastal erosion hazard zones were developed, representing an area where erosion (caused by coastal processes) has the potential to occur over a certain time period. This does not mean that the entire hazard zone is eroded away; rather, any area within this zone is at risk of damage due to erosion during a major storm event. The coastal hazard zones were developed based on three factors: historic erosion, additional erosion due to sea level rise, and the potential erosion impact caused by a large storm wave event (i.e., 100-year).

Portions of the proposed CalAm Distribution System: Monterey Pipeline in Monterey would be located in areas that would be subject to flooding and coastal erosion from sea level rise and storm tides as shown on **Figure 4.8-6** and described in **Sections 4.8.2.3** and **4.8.4.4**. Within **Section 4.8.4.4**, the impact due to coastal erosion related to the CalAm Distribution System: Monterey Pipeline was found to be significant and mitigation was provided in that section (see Impact GS-5). However, once constructed, the pipelines would be located underground and would not impede or redirect flood flows, nor be subject to a significant risk of flood damage from sea level rise. The CalAm Distribution System: Monterey Pipeline and Lake El Estero would have a less-than-significant impact related to flood risks from sea level rise.

In the City of Monterey, the dune erosion envelopes are projected to extend inland 65 feet by 2060, with another 110 feet possible with a 100-year storm event. The Lake El Estero Diversion Site is outside of this 100-year storm event dune erosion envelope and would not be at risk of flooding due to sea level rise or storm surges and tides. Coastal erosion is addressed in more detail in **Section 4.8, Geology, Soils, and Seismicity**.

Therefore, the Proposed Project would not expose people or structures to risk from flooding due to sea level rise and storm surges or tides. The impact would be a less than significant and no mitigation measures would be required.

Impact Conclusion

During operations, some Proposed Project facilities (Salinas Pump Station, Salinas Treatment Facility Storage and Recovery, Tembladero Slough, and Blanco Drain Diversion sites) may be exposed to flooding due to failure of a levee or dam. In addition, the CalAm Distribution System: Monterey Pipeline and the Lake El Estero Source Water

Diversion sites may be exposed to sea level rise, and storm surges/tides related to climate change. Flooding due to failure of a levee or dam, sea level rise, nor storm surges/tides would pose a substantial or significant risk of loss, injury, or death. The Proposed Project would result in a less than-significant impact related to flooding due to failure of a levee or dam, sea level rise, and climate-related storm surges/tides, and no mitigation measures would be required.

Impact HS-10: Operational Seiche, Tsunami, or Mudflow Risk. The Proposed Project operations would not expose people or structures to substantial risk from flooding due to a seiche, tsunami, or mudflow. (Criterion i) (Less than Significant)

The Proposed Project would have no effect on the frequency or probability of seiches (i.e., earthquake-induced oscillating waves in an enclosed water body), because the Proposed Project would not create new enclosed water bodies or affect the frequency of earthquakes. Further, the Proposed Project does not include the construction of habitable structures near any isolated bodies of water subject to inundation by seiche. No mudflows have been mapped at the Proposed Project component sites, and mudflows are extremely rare throughout the Proposed Project area (Monterey County, 2008). In addition, there would be no new development on slopes greater than 30%. Other types of slope instability issues are discussed in **Section 4.8, Geology, Soils, and Seismicity**. Therefore, the Proposed Project would have a less-than-significant impact related to risks due to inundation by seiche or mudflow and no mitigation measures would be required.

The Proposed Project encompasses coastal areas in Monterey County that could be subject to tsunamis. Tsunamis are generally caused by earthquakes, but can also be caused by a volcanic eruption or landslide. Damage caused by tsunamis is typically confined to low-lying coastal areas. The underground facilities, including all of the pipelines, would not likely be damaged by a tsunami.

A majority of the coastline along Monterey Bay is mapped within a tsunami inundation area, which includes the locations of the following project components: portions of the proposed CalAm Distribution System: Monterey Pipeline, and the areas within and around the proposed Lake El Estero Diversion site, and the Tembladero Slough and Blanco Drain Diversion sites. None of the other project components are within the mapped tsunami inundation areas. Water supply infrastructure such as the source water diversions and potable water pipelines are designed to withstand temporary inundation due to tsunami, seiche, storm surges, and flood flows. Damage to, temporary inundation of, or temporary exposure of the proposed new water supply infrastructure due to flooding or tsunami is not expected to result in a significant risk of loss, injury or death (Ninyo & Moore, 2014). The Proposed Project would have a less-than-significant impact related to tsunami risks and no mitigation measures would be required.

4.11.4.5 Cumulative Impacts and Mitigation Measures

Cumulative Impact: Inland Surface Waters

The geographic scope for cumulative impact analysis on hydrology and water quality of inland surface water includes the watersheds of the surface water bodies that would receive surface flows that originate or interact with other surface water (in the case of flooding and inundation) at the Proposed Project sites, including the following:

- Salinas River between the City's stormwater outfall pipeline just east of the Davis Road bridge over the Salinas River and the Salinas River lagoon,

- Reclamation Ditch below the Davis Road overcrossing downstream to its confluence with the Tembladero Slough,
- Tembladero Slough from its confluence with the Reclamation Ditch to the confluence with the Old Salinas River channel
- Old Salinas River Channel between the Old Salinas River Channel gated outlet and the Potrero Tide Gate near Moss Landing Harbor
- Moss Landing Harbor, Monterey Bay and Pacific Ocean

Based on the list of cumulative projects provided on **Table 4.1-2** (see **Section 4.1**), there are numerous other proposed or planned developments within the watershed areas potentially affected by the Proposed Project, including the proposed MPWSP (the small, 6.4 mgd desalination plant) (also referred to as the CalAm Facilities of the MPWSP Variant per the MPWSP EIR).

The discussion of cumulative impacts is organized to address the combined impacts of the Proposed Project plus the MPWSP (with the 6.4 mgd desalination plant) and then to address the overall combined impacts of the Proposed Project and all relevant past, present and probable future projects:

- *Combined Impacts of Proposed Project Plus MPWSP (with 6.4 mgd Desalination Plant):* The CalAm MPWSP includes: a seawater intake system; a source water pipeline; a desalination plant and appurtenant facilities; desalinated water conveyance facilities, including pipelines, pump stations, a terminal reservoir; and an expanded ASR system, including two additional injection/extraction wells (ASR-5 and ASR-6 Wells), a new ASR Pump Station, and conveyance pipelines to convey between the well. The CalAm Distribution Pipelines (Transfer and Monterey) would be constructed for either the MPWSP or GWR projects. The estimated construction schedule would overlap for approximately 18 months, from mid-summer 2016 to the end of 2017. The cumulative impact analysis in this EIR anticipates that the Proposed Project could be combined with a version of the MPSWP that includes a 6.4 mgd desalination plant. Similarly, the MPSWP EIR is evaluating a “Variant” project that includes the proposed CalAm Facilities (with the 6.4 mgd desalination plant) and the Proposed Project. The impacts of the Variant are considered to be cumulative impacts in this EIR. The CalAm and GWR Facilities that comprise the MPSWP Variant are shown in **Appendix Y**.
- *Overall Cumulative Projects*: This impact analysis is based on the list of cumulative projects provided on **Table 4.1-2** (see **Section 4.1**). The overall cumulative impacts analysis considers the degree to which all relevant past, present and probable future projects (including the MPWSP (with the 6.4 mgd desalination plant)) could result in impacts that combine with the impacts of the Proposed Project.

Combined Impacts of Proposed Project Plus MPWSP with 6.4 mgd Desal Plant

Combined Construction Impacts

Table 4.11-6, above provides a summary of impacts of the GWR Facilities for construction-related impacts of hydrology and water quality, including surface water quality impacts due to discharges (HS-1), and surface water quality impacts due to earthmoving, drainage alterations, and use of hazardous chemicals (HS-2). These impacts were found to be less-than-significant with compliance with the requirements of state and local agencies and professional engineering standards during construction.

The MPSWP would have similar impacts from construction-related discharges due to well drilling, development, and testing, and dewatering of shallow groundwater during excavations.

The CalAm Desalinated Water Pipeline (or Transmission Main) component of the MPWSP with 6.4 mgd Desalination Plant would be constructed in a similar location as the segments of the Proposed Project's Product Water Conveyance Coastal Alignment pipeline along the Transportation Agency's rail line corridor. The Transmission Main that would be located near and parallel to the Coastal alignment option for the GWR Product Water Conveyance pipeline would be between the Del Monte Boulevard crossing of the Monterey Peninsula interceptor (north of Marina) and the intersection of Divarty Road and Highway 1 near the northwestern border of the City of Seaside.

The construction of the two pipelines would be in proximity to each other, but would not be located within the same alignment trenches. The two projects would not add to each other's impacts on surface water quality due to dewatering shallow groundwaters when excavating, earthmoving, drainage alterations, and use of hazardous chemicals. Both projects would be required to comply with local and state regulatory and permitting requirements include avoiding polluted discharges to surface water bodies, and the projects' individual surface water impacts at well sites would not add to each other's surface water impacts because the well sites would not be within the same watershed area and both would be subject to local and state regulatory and permitting requirements.

Combined Operational Impacts

Proposed Project operational impacts to hydrology and surface water were also found to be less than significant, including the following:

- Surface Water Quality Impacts due to Well Maintenance Discharges (HS-3)
- Marine Water Quality Impacts due to Ocean Discharges (HS-5)
- Drainage Pattern Alterations (HS-6)
- Risks due to Location within 100-Year Flood Area (HS-8)
- Operational Risks due to Flooding due to Levee/Dam Failure, or Coastal Inundation (HS-9)
- Operational Seiche, Tsunami, or Mudflow Risk (HS-10)

Based on the Proposed Project objectives, implementation of the Proposed Project would beneficially impact the Carmel River system, including conditions due to erosion, bank stability, and water quality. Regarding hydrologic changes due to source water diversions, the Proposed Project has the potential to result in erosion and bank instability due to rapid water level fluctuations when operating the diversion pumps at the Reclamation Ditch Diversion site. Implementation of Mitigation Measure HS-4 would reduce the impact to a less-than-significant level by requiring appropriate management of diversion pumps to avoid rapid water level fluctuations downstream of the Reclamation Ditch Diversion site.

Both the Proposed Project and the MPSWP would incrementally benefit the hydrology and water quality conditions in the Carmel River system by providing replacement supplies in accordance with the State Water Resources Control Board Cease and Desist Order. The combined projects (GWR Project and the MPWSP with 6.4 mgd desalination plant) would provide for all the replacement water that the State Board required of CalAm. The MPWSP (with 6.4 mgd desalination) does not propose diversions from surface waters, therefore would not add to the potentially significant operational surface water quality impacts due to source water diversions.

Both the Proposed Project and the MPSWP would have similar and less-than-significant impacts to surface water quality impacts due to well maintenance discharges and drainage pattern alterations due to the requirements for both projects to comply with local and state regulatory programs to control discharges and runoff to prevent water quality changes by retaining discharges and runoff on site with appropriate BMPs and low impact development standards included in the relevant permits. The impacts of each project from risks of exposure of people or structures to flooding due to levee failure, coastal inundation and seiche, tsunami or mudflow risks would not be additive.

Overall Cumulative Impacts. This impact analysis is based on the list of cumulative projects provided on **Table 4.1-2** (Also see **Figure 4.1-2** in **Section 4.1**). The overall cumulative impacts analysis considers the degree to which all relevant past, present and probable future projects could result in impacts that combine with the impacts of the Proposed Project.

Because of the localized nature of the anticipated individual project impacts, the projects listed in **Table 4.1-2** would not combine with those of the Proposed Project to cause or contribute to potential cumulative surface water hydrology and water quality impacts. Construction of all projects would be subject to applicable City and County construction and grading ordinances, local permit requirements and state waste discharge requirements (NPDES permits). Thus, there would be no significant construction-related cumulative impacts of the Proposed Project combined with all other projects related to surface water hydrology and water quality beyond the impacts of individual components of each project.

Cumulative Impact Conclusion: Inland Surface Waters

There would be no significant cumulative construction or operational impacts to inland (and indirect marine) surface water quality to which the Proposed Project would contribute. Construction of the MPWSP Transmission Pipeline and GWR Product Water Conveyance Pipeline Coastal Alignment may have overlapping or close construction schedules, however compliance with the permitting requirements of local and state agencies related to stormwater water quality and drainage would ensure combined impacts would not be significant.

Ocean Discharge Impacts on Marine Water Quality - Combined Analysis

The geographic scope for cumulative impact analysis on marine water quality includes the area near the MRWPCA ocean outfall diffusers (the marine study area shown in **Figure 4.13-1**). Based on the list of cumulative projects provided on **Table 4.1-2, Project Considered for Cumulative Analysis (listed by primary geographic area in which project is located)** (see **Section 4.1, Introduction**), no cumulative projects have been identified that would result in impacts to this area, except for the MPWSP (with the 6.4-mgd Desalination Plant) (also referred to as the CalAm facilities of the MPWSP Variant).[21] The discussion of cumulative impacts is organized to address the combined impacts of the Proposed Project plus the MPWSP (with the

[21] Although in the future, Marina Coast Water District may propose to use the MRWPCA ocean outfall for the disposal of desalination brine; the currently approved program and project is called the Desalination component of the Regional Urban Water Augmentation Project (a portion of the Hybrid Alternative) that does not include discharge of brine through the MRWPCA outfall, but instead would discharge brine subsurface in the vicinity of Reservation Road and Marina State Beach (Marina Coast Water District, 2004).

6.4 mgd Desalination Plant) and then to address the overall combined impacts of the Proposed Project and all relevant past, present and probable future projects:

- *Combined Impacts of Proposed Project Plus MPSWP (with 6.4-mgd Desalination Plant)*: The CalAm MPWSP includes a subsurface seawater intake system; a source water pipeline; a desalination plant and appurtenant facilities; desalinated water conveyance facilities, including pipelines, pump stations, a terminal reservoir; and an expanded ASR system, including two additional injection/extraction wells (ASR-5 and ASR-6 Wells), a new ASR Pump Station, and conveyance pipelines. The CalAm Distribution Pipelines (Transfer and Monterey) would be constructed for either the MPWSP or GWR Project. The cumulative impact analysis in this EIR anticipates that the Proposed Project could be implemented with a version of the MPWSP that includes a 6.4 mgd desalination plant. Similarly, the MPSWP EIR is evaluating a "Variant" project that includes the proposed CalAm Facilities (with the 6.4 mgd desalination plant) and the Proposed Project. The impacts of the Variant are considered to be cumulative impacts in this EIR. The CalAm and GWR Facilities that comprise the MPSWP Variant are shown in **Appendix Y**.
- *Overall Cumulative Projects*: This impact analysis is based on the list of cumulative projects provided on **Table 4.1-2** (see **Section 4.1**). The overall cumulative impacts analysis considers the degree to which all relevant past, present and probable future projects (including the MPSWP (with the 6.4 mgd desalination plant)) could result in impacts that combine with the impacts of the Proposed Project.

The only other projects that may add with the Proposed Project's marine water quality impacts would be projects that would also change the ocean environment in the immediate vicinity of the outfall. As documented above, the Proposed Project ocean discharges would meet all Ocean Plan objectives (i.e., concentrations of the constituents in the ocean at the edge of the zone of initial dilution would be less than the Ocean Plan objectives) and thus, would have a less-than-significant impact on marine water quality.

Combined Impacts of Proposed Project Plus MPSWP (with 6.4 mgd Desalination Plant). In addition to conducting the Proposed Project's technical analysis of the Ocean Plan compliance, Trussell Technologies also prepared a parallel analysis of the Ocean Plan compliance issues (and thus the impacts on marine water quality and biological resources) for the MPWSP (with 6.4 mgd Desalination Plant) CalAm desalination plant combined with the Proposed Project. That analysis is provided in **Appendix V, Ocean Plan Compliance Assessment for the Monterey Peninsula Water Supply Project and Project Variant** and **Appendix U-2 ,Update to Ocean Plan Compliance Assessment Reports** (herein referred to together as the MPWSP/Variant Ocean Plan Assessment) (Trussell Technologies, 2015b and 2015c).

The purpose of the MPWSP/Variant Ocean Plan Assessment was to assess the ability of the MPWSP (with the larger, 9.6 mgd desalination plant) and of the MPSWP (with the small, 6.4 mgd desalination plant) plus the Proposed Project (the "Variant") to comply with the Ocean Plan objectives using the same methodology and approach described above for the Proposed Project. For this assessment, Trussell Technologies also used a conservative approach to estimate the water qualities of the secondary effluent, GWR concentrate, desalination brine, and hauled brine for these projects. The water quality data were then combined for various discharge scenarios, and a concentration at the edge of the ZID was calculated for each constituent and scenario. Compliance assessments could not be made for selected constituents, as noted, due to analytical limitations, but this is a typical occurrence for these types of Ocean Plan constituents.

Based on the data, assumptions, modeling, and analytical methodology presented in the MPWSP/Variant Ocean Plan Assessment, the MPSWP (with the 6.4 mgd desalination plant) combined with the Proposed Project would result in a significant cumulative impact due to potential exceedances of the Ocean Plan objectives at the edge of the ZID. Implementation of the MPSWP (with the 6.4-mgd Desalination Plant) and the Proposed Project would require mitigation measures to reduce the impact to a less-than-significant level to comply with the Ocean Plan objectives under some discharge scenarios. Specifically, three types of exceedances were identified:

(1) PCBs, which are present in relatively high concentrations in the worst-case ocean water samples, were predicted to exceed the Ocean Plan objectives in several scenarios for the discharges from GWR Project combined with the MPWSP 6.4 mgd desalination plant at times when the desalination brine from the MPSWP represents a relatively large fraction (approximately 40% or more) of the total discharge water,

(2) Ammonia, which is consistently present at a relatively high concentration in secondary effluent from the Regional Treatment Plant, was predicted to potentially exceed the Ocean Plan objective for scenarios where both the desalination brine and a moderate secondary effluent flow from the Regional Treatment Plant are discharged. The exceedance would also potentially occur when the discharge contains the GWR reverse osmosis concentrate and moderate to no (approximately 6 mgd or less) discharge of secondary effluent flow from the Regional Treatment Plant.

(3) Chlordane, DDT, TCDD equivalents, and toxaphene (along with PCBs and Ammonia), were predicted to exceed the Ocean Plan objective for scenarios where the combined discharge would consist of desalination brine and GWR reverse osmosis concentrate with either moderate to no flow (approximately 6 mgd or less) of secondary effluent.

The Proposed Project would not result in a considerable contribution to the significant cumulative impact pertaining to discharge of PCBs. The MPSWP standing alone would cause this significant impact, due to PCBs in existing in ocean water, which would be concentrated at levels above background ocean water in the desalination plant brine.

The Proposed Project would contribute to the significant cumulative impact pertaining to the discharge of ammonia. The exceedance would be a result of the combination of ammonia present in the secondary effluent and GWR concentrate combined with high salinity of the desalination brine[22]. Ammonia is not expected to exceed the Ocean Plan objective when the discharge consists of secondary effluent and/or GWR reverse osmosis concentration without desalination brine, or when the desalination brine is combined with approximately 6 mgd or more of secondary effluent, because in these cases there would be sufficient mixing in the ZID

[22] The desalination brine has a relatively high salinity (approximately 57,500 mg/L of TDS), compared to ambient seawater (33,000 to 34,000 mg/L of TDS), such that when discharged on its own, the denser brine would sink and experience relatively less mixing with ocean water and thus less dilution in the ZID (approximately 10 times less). The secondary effluent (approximately 1,000 mg/L of TDS) and GWR reverse osmosis concentrate (approximately 5,000 mg/L of TDS) are relatively light and would rise when discharged. In the combined discharge, the secondary effluent and GWR reverse osmosis concentrate would dilute the salinity of the desalination brine and thus reduce the density. With sufficient dilution, the combined discharge would be less dense than the ambient ocean water, resulting in a rising plume with more dilution in the ZID.

to adequately dilute the discharge. Similarly, no exceedance is expected when the discharge contains desalination brine with less than approximately 3 mgd of secondary effluent flow and no GWR reverse osmosis concentrate, due to the lower ammonia loading. This potential ammonia exceedance would occur for the MPSWP when desalination brine is combined with 3 to 6 mgd of secondary effluent or when combined with GWR reverse osmosis concentrate and 6 mgd or less of secondary effluent. The largest potential exceedance of ammonia is expected at times when the combined discharge consists of desalination brine and GWR reverse osmosis concentrate with no secondary effluent flow.

The Proposed Project also would contribute to a significant cumulative impact pertaining to the discharge of chlordane, DDT, and TCDD equivalents to a similar degree as it does to ammonia, where the exceedance would be a result of constituents in the secondary effluent and ocean water and inadequate dilution in the ZID due to the density of the desalination brine. Because these constituents would potentially not meet the Ocean Plan water quality objectives at the edge of the ZID in some combined discharge conditions, the Proposed Project would have a considerable contribution to a significant cumulative water quality impact. Implementation of Mitigation Measure HS-C would be required to reduce the cumulative impact to a less than significant level.

Cumulative Marine Water Quality Impact Conclusion

The water quality impact has been studied for multiple discharge scenarios resulting from the operation of the GWR Project with the MPWSP with the 6.4 mgd desalination plant. The water quality analysis used the best available information and the impact conclusion is based on modeled constituents in the discharge streams and water quality data collected from Monterey Bay under CCLEAN to represent source water entering the MPWSP Desalination Plant. **Table 4.11-22** summarizes the exceedances of water quality objectives for constituents at the edge of the ZID from combined discharges composed of brine from the MPWSP with 6.4 mgd desalination project, GWR concentrate, and secondary effluent:

Table 4.11-22
Potential Water Quality Objectives Exceedances at the Edge of the ZID

Combined Discharge [a]	Desalination Brine	Secondary Effluent	GWR Concentrate	Potential Exceedances
Desalination brine only	X			PCBs
Desalination brine combined with 3-6 mgd of secondary effluent	X	X		PCBs and ammonia
Desalination brine combined with 0-3 mgd or 6-14 mgd of secondary effluent	X	X		PCBs
Desalination brine combined with greater than 14 mgd of secondary effluent	X	X	X	None
Desalination brine combined with GWR concentrate and 0-6 mgd of secondary effluent	X	X	X	Ammonia, chlordane, DDT, PCBs, TCDD Equivalents, toxaphene
Desalination brine combined with GWR concentrate and 6-14 mgd of secondary effluent	X	X	X	PCBs
Desalination brine combined with GWR concentrate and 14 mgd of secondary effluent	X	X	X	None
GWR concentrate combined with secondary effluent		X	X	None
GWR concentrate only			X	None
Secondary effluent only		X		None

[a] Indicated secondary effluent flow values are approximate estimations.

Based on the water quality analyses, the desalination brine-only, desalination brine-and-secondary effluent (at 3 to 6 mgd of flow), and blended discharges (with less than 14 mgd of secondary effluent) would result in a significant impact to marine water quality, which would be reduced to less-than-significant level through implementation of **Mitigation Measure HS-C**. The mitigation would involve employing one or more of the design features and/or operational measures listed below prior to operating the MPWSP desalination plant. The design features and operational measures include short-term storage and release of brine from the MPWSP desalination plant, treatment of the MPWSP source water and/or brine discharge(s), and biologically active filtration at the Regional Treatment Plant. These operational changes or measures along with the additional analysis of the constituents in MPWSP source waters would be incorporated into the NPDES permit issued by the Regional Water Quality Control Board as part of the process of amending the MRWPCA NPDES Permit (R3-2014-0013). The Proposed GWR Project when implemented in combination with the MPWSP with 6.4 mgd desalination plant would result in a less-than-significant cumulative impact to marine water quality with implementation of Mitigation Measure HS-C, below.

Mitigation Measure HS-C: Implement Measures to Avoid Exceedances over Water Quality Objectives at the Edge of the Zone of Initial Dilution (ZID).

As part of the amendment process to modify the existing MRWPCA NPDES Permit (Order No. R3-2014-0013, NPDES Permit No. CA0048551) per 40 Code of Regulations Part 122.62, it would be necessary to conduct an extensive assessment in accordance with requirements to be specified by the RWQCB. It is expected that the assessment would include, at a minimum, an evaluation of the minimum probable initial dilution at the point of discharge based on likely discharge scenarios and any concomitant impacts on water quality and beneficial uses per the Ocean Plan. Prior to operation of the MPSWP desalination plant, the discharger(s) will be required to test the MPSWP source water in accordance with protocols approved by the RWQCB. If the water quality assessment indicates that the water at the edge of the ZID will exceed the Ocean Plan water quality objectives, the MRWPCA will not accept the desalination brine discharge at its outfall, and the following design features and/or operational measures shall be employed, individually or in combination, to reduce the concentration of constituents to below the Ocean Plan water quality objectives at the edge of the ZID:

- Additional pre-treatment of MPWSP source water at the Desalination Plant: Feasible methods to remove PCBs and other organic compounds from the MPWSP source water at the desalination plant include additional filtration or use of granular activated carbon (GAC). GAC acts as a very strong sorbent and can effectively remove PCBs and other organic compounds from the desalination plant source water (Luthy, Richard G., 2015). Indirect impacts of implementation of this portion of the mitigation measure are discussed in the following section.
- Treatment of discharge at the Desalination Plant: Feasible methods to remove residual compounds from the discharge to comply with water quality objectives at the edge of the ZID are use of GAC (similar to that under the additional pre-treatment of MPWSP source water) and advanced oxidation with ultraviolet light with concurrent addition of hydrogen peroxide. The method of using advanced oxidation with ultraviolet light with concurrent addition of hydrogen peroxide is used for the destruction of a variety of environmental contaminants such as synthetic organic compounds, volatile organic compounds, pesticides, pharmaceuticals and personal care products, and disinfection byproducts. This process is energy intensive, but requires a relatively small construction footprint. Indirect impacts of implementation of this portion of the mitigation measure are discussed in the following section
- Short-term storage and release of brine at the Desalination Plant: When sufficient quantities of treated wastewater from the Regional Treatment Plant to prevent an exceedance of Ocean Plan objectives at the edge of the ZID are not available, brine from the desalination plant would be temporarily stored at the MPWSP site in the brine storage basin,[23] and discharged (pumped) in pulse flows (up to the capacity of the existing outfall), such that the flow rate allows the discharge to achieve a dilution level that meets Ocean Plan water quality objectives at the edge of the ZID. Indirect impacts of implementation of this portion of the mitigation measure are discussed in the following section

[23] A detailed description of the brine storage facility at the desalination plant site will be available in the MPWSP EIR Chapter 3, Project Description, scheduled for availability to the public at the end of April.

- Biologically Active Filtration at the Regional Treatment Plant: As part of the proposed AWT Facility at the Regional Treatment Plant, the GWR Project includes the potential for use of upflow biologically active filtration following 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 a media support system. Ancillary systems would include an alkalinity addition system for pH control, backwash waste water basin (also used for membrane filtration backwash waste water), backwash pumps, an air compressor and supply system for air scour, an air compressor and supply system for process air, and a wash water basin to facilitate filter backwashing (the wash water basin may be combined with the membrane filtration flow equalization basin). This biologically active filtration system may be needed to meet Ocean Plan water quality objectives at the edge of the ZID (if and/or when discharges from the Proposed Project are combined with discharges from the MPWSP with 6.4 mgd desalination plant). This optional component of the Proposed Project is described in **Chapter 2, Project Description** (see Section 2.8.1.3), would become a required process if the MPWSP with 6.4 mgd desalination project is in operation and the other components of the mitigation do not achieve Ocean Plan compliance. The impacts of implementation of this portion of the mitigation measure are discussed in Sections 4.2 through 4.18 as a component of the AWT Facility (within the "Treatment Facilities at the Regional Treatment Plant" component of the Proposed Project).

Effects of Implementation of Mitigation Measure HS-C

Potential impacts associated with implementation of Mitigation Measure HS-C (Implement Measures to Avoid Exceedances of Water Quality Objectives at the Edge of the ZID) are discussed below. These impacts would be associated with the potential new facilities to be constructed at the MPSWP desalination plant, which could include a GAC facility, advanced oxidation system, as well as any storage and any pumping facilities that may be installed at the MPWSP desalination plant site as part of Mitigation Measure HS-C. Installation and operation of the potential Biologically Active Filtration System at the Regional Treatment Plant would not result in any adverse impacts beyond those already addressed in this EIR because the Biologically Active Filtration System has been evaluated as a potential component of the Proposed Project.

Granular Activated Carbon (GAC)

Treatment of the desalination plant source water or brine could potentially be provided by GAC filter-adsorbers within the footprint of the proposed MPWSP desalination plant. Operation of the GAC system would generate spent GAC, which would be considered hazardous waste. Handling and disposal of the waste generated would be subject to federal and state hazardous waste regulations (discussed in Section 4.9, Hazards and Hazardous Materials). Thus, handling, transportation, and disposal of the spent GAC material generated at the MPWSP desalination plant would be subject to, and would adhere to, the regulations intended to protect environmental and public health and ensure safety. Therefore, the impact would be less than significant.

Operating the GAC adsorption system also would result in an increase in energy use by the MPSWP, in particular if there were additional pumping necessary. The increase in greenhouse gas emissions due to increased energy use from the MPWSP would contribute to the MPSWP's significant and unavoidable impact.

Maintenance of the GAC system would involve removing and replacing the GAC, which would require that the spent GAC be transported to a permitted disposal site and replacement GAC would be transported to the desalination plant site. These traffic and transportation impacts and other impacts of this transportation / traffic generation (air quality, noise, and energy demand) would increase the adverse impacts of the MPSWP.

Advanced Oxidation for PCBs Removal

The advanced oxidation system would likely include a building with a liquid hydrogen peroxide chemical storage and feed system. The building would be installed as part of the construction activities associated with the MPWSP. The advanced oxidation process would generate minimal byproducts and no residuals compounds or liquid or solid waste.

Implementing the advanced oxidation system would result in an increase in energy use by the MPSWP. It is anticipated that operation of the advanced oxidation system would thus increase the energy use at the proposed desalination plant. The increase in greenhouse gas emissions due to increased energy use from the MPWSP with 6.4 mgd desalination plant would contribute to the MPSWP's significant and unavoidable impact.

The advanced oxidation system would require a liquid hydrogen peroxide chemical storage and feed system onsite at the MPSWP desalination plant. The impact from routine transport, use, or disposal of hazardous materials during facility operations is discussed under in Section 4.9, Hazards and Hazardous Materials.

Storage and Pumping to Release Brine at a Higher Discharge Rate

The MPWSP proposes a 3-mgd storage tank. It is expected that this component of the measure may need to be implemented in combination with one or more of the measures above to achieve compliance with Ocean Plan objectives and to reduce the cumulative impact to a less than significant level. Operation of the pumps required to discharge the MPSWP desalination plant brine at a higher flow rate than has been proposed by the MPSWP and would require increased energy use by the MPSWP. Such increased energy use would result in an increase in greenhouse gas emissions, which would contribute to the MPSWP's significant and unavoidable impact. The implementation of this mitigation measure component would thus also result in increased impacts identified above for the prior components, but perhaps a smaller increase in impacts.

Overall Cumulative Projects. No other cumulative projects would change the marine water quality conditions in the area in the immediate vicinity of the MRWPCA ocean outfall, and thus, there would be no cumulative significant impacts besides those described above for the MPSWP (with the 6.4 mgd desalination plant) combined with the Proposed Project.

As discussed previously, the Proposed Project would also reduce pollutant loads to the marine environment due to diversion and treatment of surface waters (or waters that are disposed directly or indirectly to surface waters) that currently flow to the Monterey Bay. The quantitative analysis of these beneficial impacts is provided in detail above. Any amount of reduction in pollutant loads on the ocean would result in a benefit to marine water qualiy due to reductions in exposure of marine biological species to pollutants. Thus, if you consider a larger geographic area of the marine environment than only the immediate vicinity of the ocean outfall, the Proposed Project would result in beneficial cumulative impacts.

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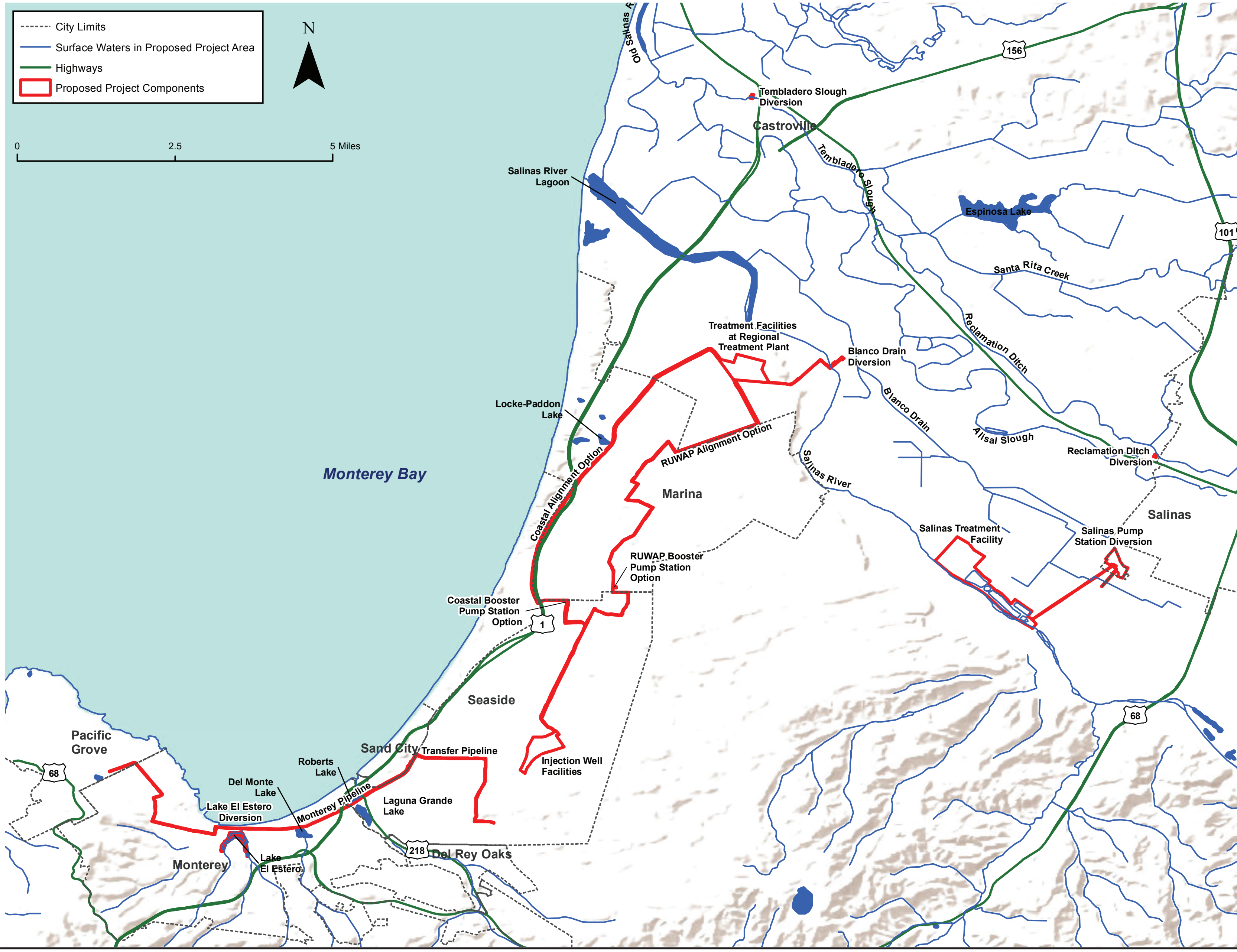


Surface Waters in Proposed Project Area

DD&A

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
4.11-1

Source: Schaaf & Wheeler, 2014b

Salinas River Watershed

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure 4.11-2

Lagoon closed to the ocean (left) and open (right). Arrow indicates gated outlet to Old Salinas River.

Source: Schaaf and Wheeler, 2014b

DD&A

Salinas River Lagoon and Gated Outlet to Old Salinas River Channel

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
4.11-3

Source: City of Salinas Stormwater Master Plan, CDM, 2004

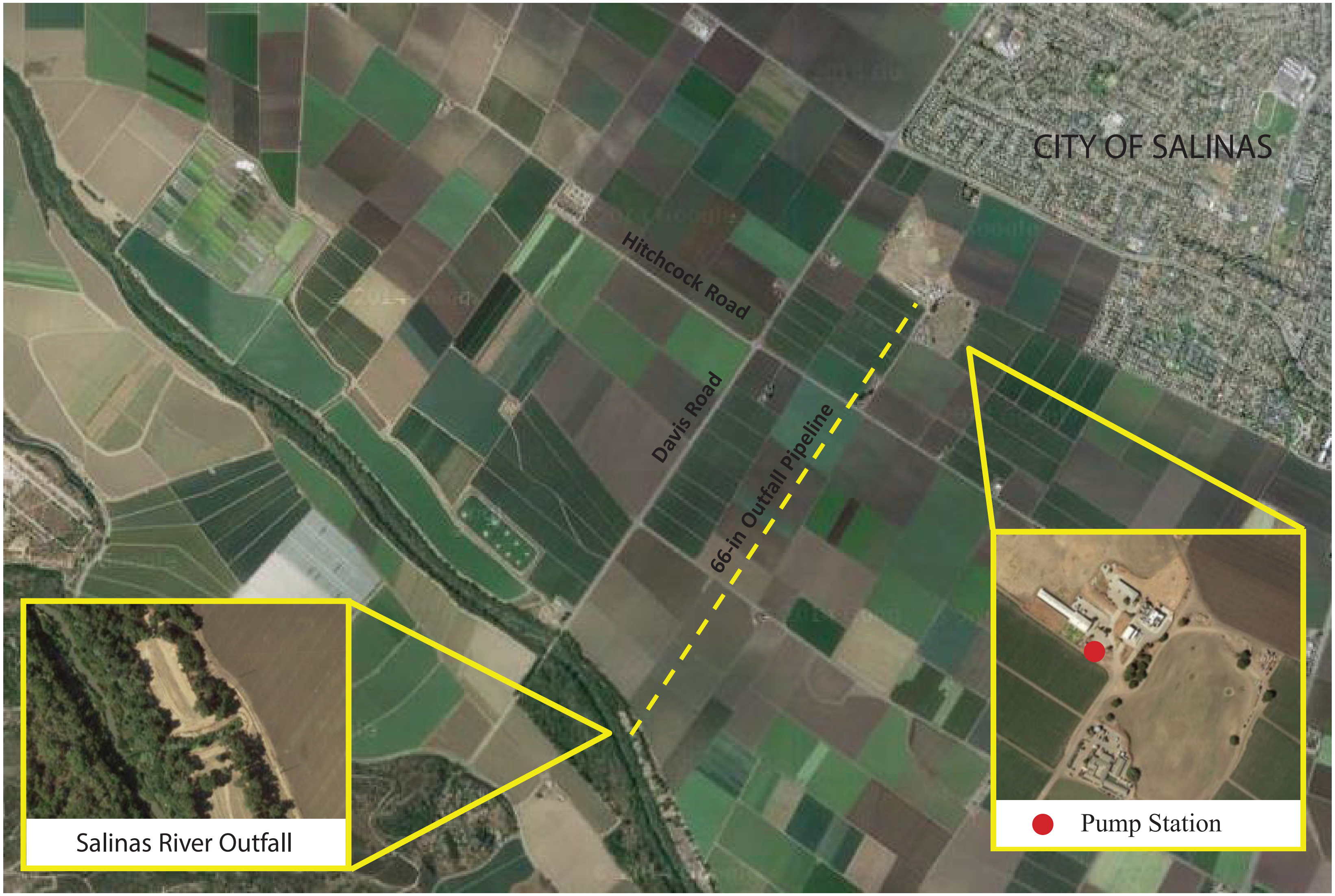
DD&A

City of Salinas Urban Stormwater Watersheds

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
4.11-4



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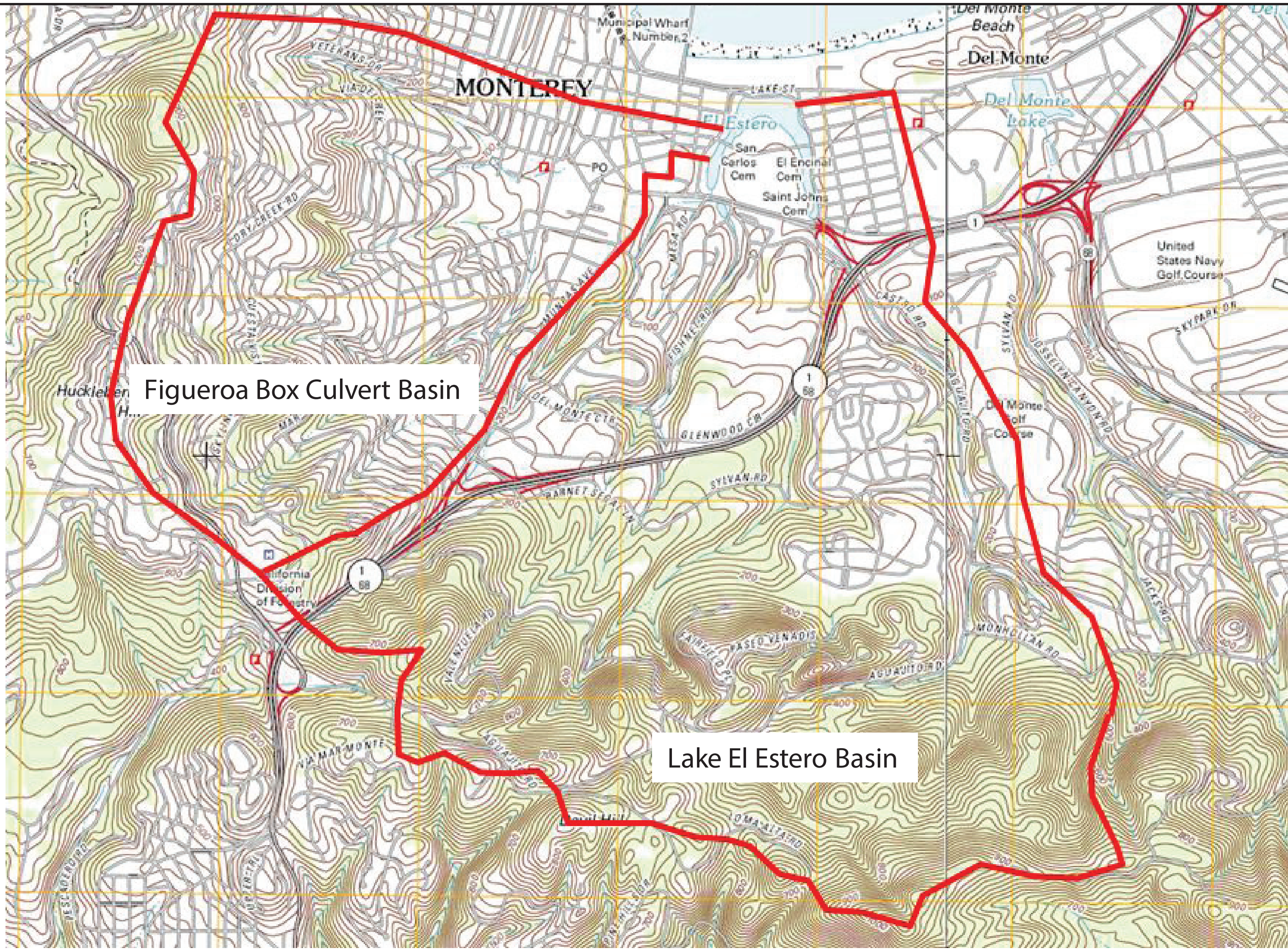
Source: Schaaf and Wheeler, 2014b

Salinas Stormwater Pump Station and Outfall Locations

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
4.11-5



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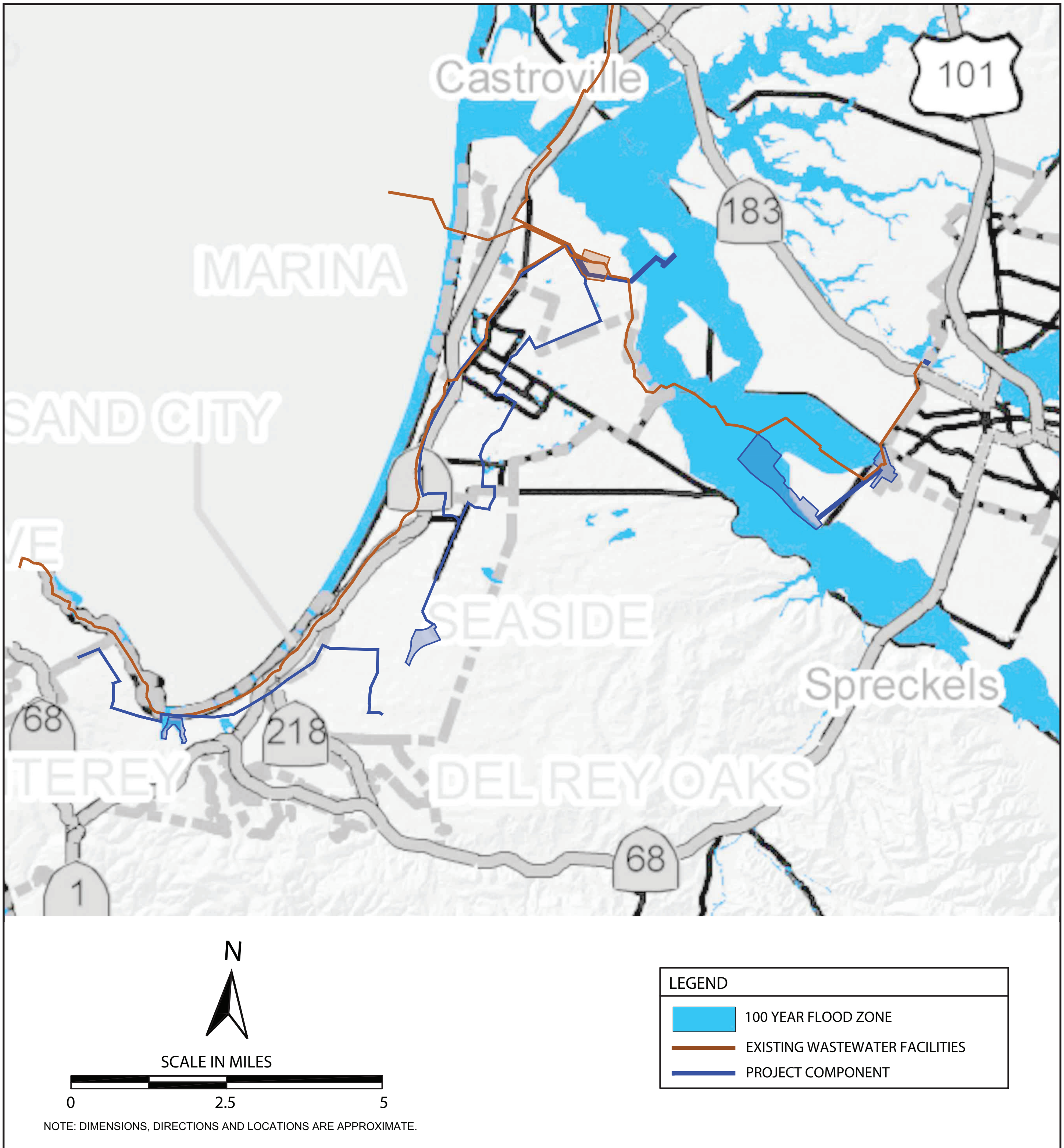
Source: Schaaf and Wheeler, 2014a

Lake El Estero Drainage Basins

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
4.11-6



Source: Ninyo & Moore, 2015

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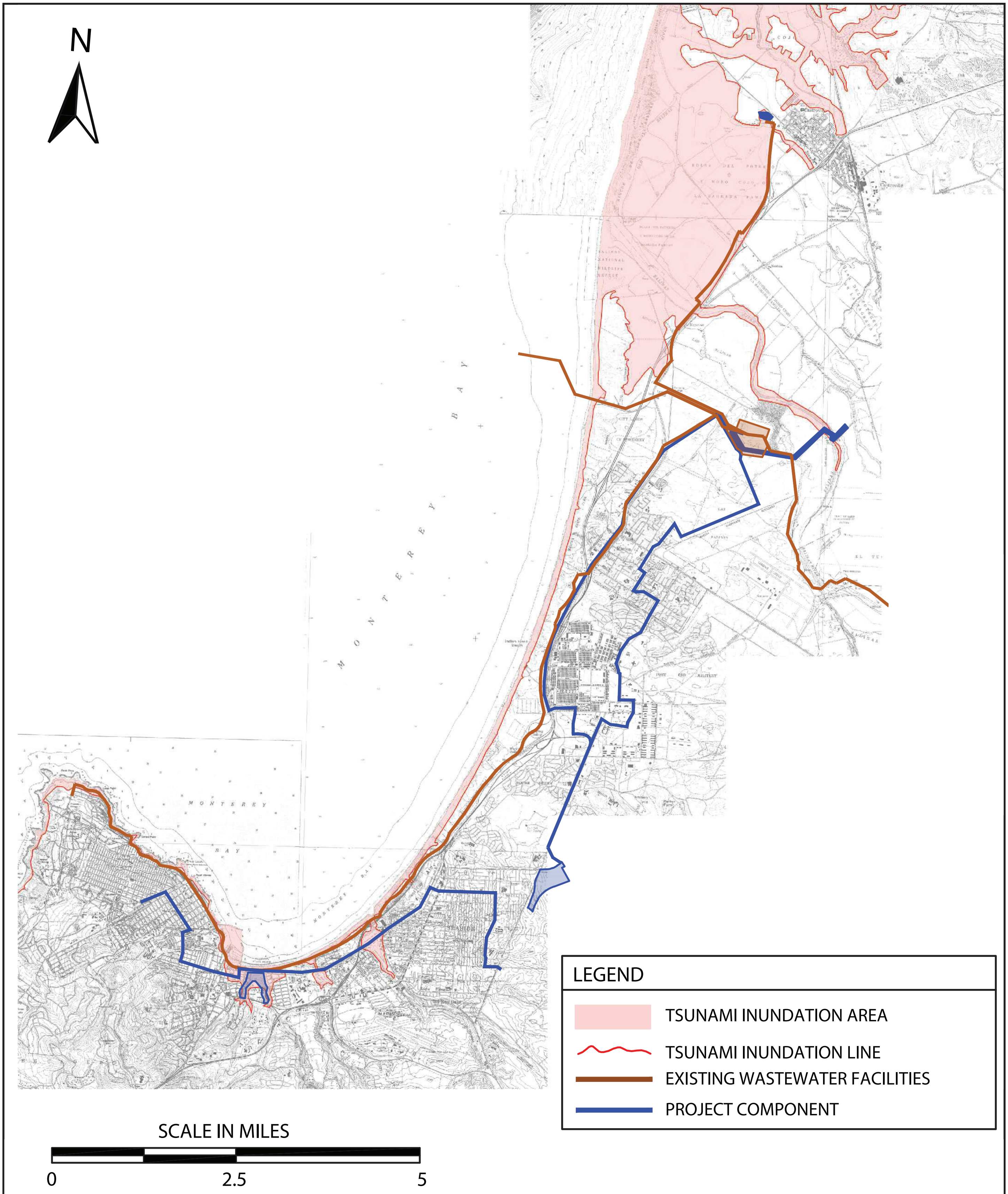
100-Year Flood Zones in the Proposed Project Area

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
4.11-7



NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Source: Ninyo & Moore, 2015

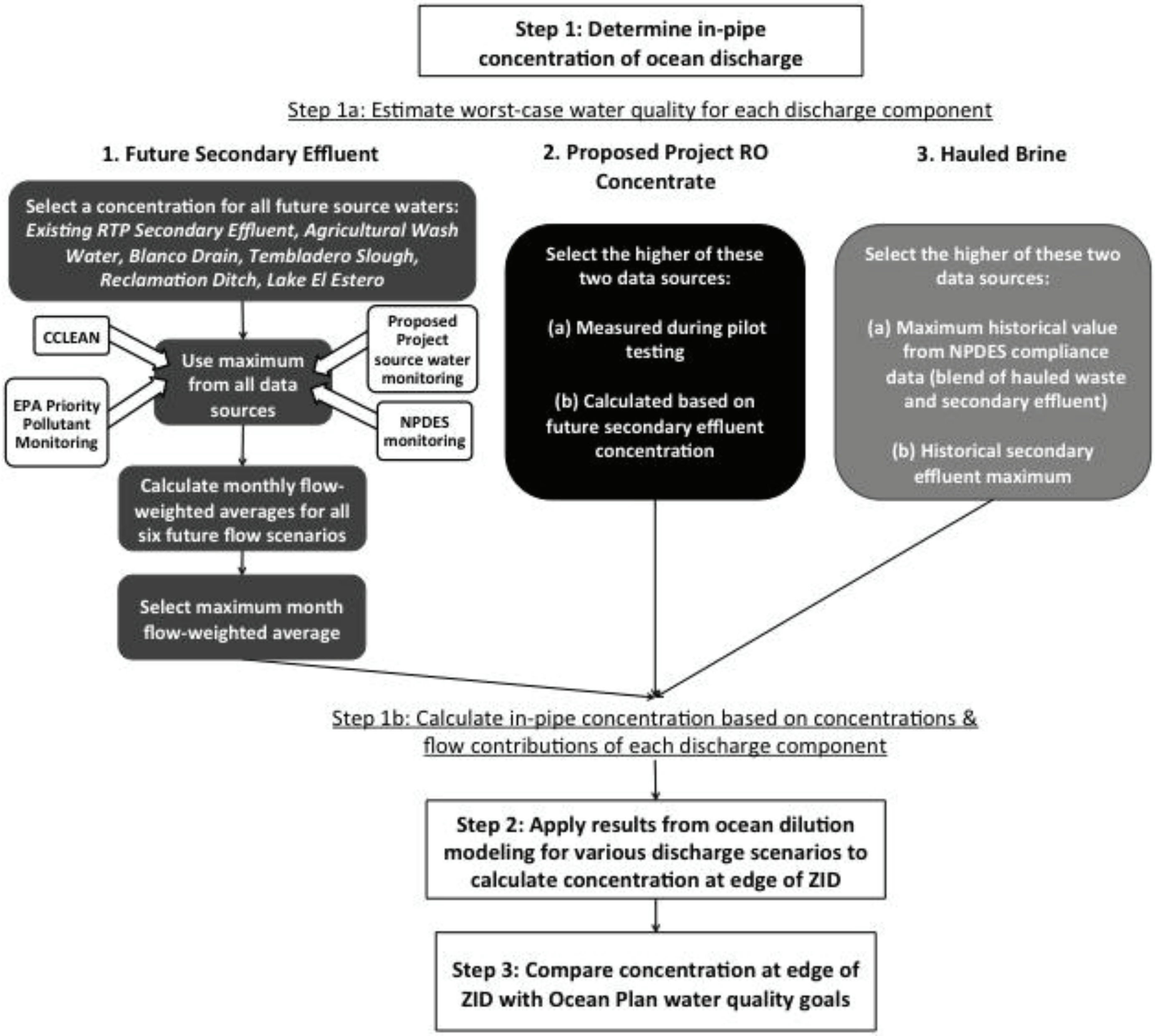
DD&A

Tsunami Inundation Areas in the Proposed Project Area

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
4.11-8



DD&A

California Ocean Plan Compliance Methodology

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
4.11-9

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