4.3 Surface Water Hydrology and Water Quality

Sections

Figures

Tables

This section analyzes the potential for the Monterey Peninsula Water Supply Project (MPWSP, also referred to herein as the proposed project) to adversely affect surface water hydrology and water quality in inland freshwater bodies and in the Monterey Bay. This section describes project impacts related to flooding. Impacts to groundwater resources are evaluated in Section 4.4, Groundwater Resources. The secondary effects of potential project-related changes in ocean water quality on marine resources are evaluated in Section 4.5, Marine Biological Resources. Impacts related to coastal erosion are evaluated in Section 4.2, Geology, Soils, and Seismicity.

4.3.1 Setting

4.3.1.1 Climate and Topography

The project area includes unincorporated areas of Monterey County and the cities of Marina, Sand City, Seaside, Monterey, and Pacific Grove. The climate in the project area is moderate throughout the year with warm, dry summers and cool, moist winters. The average temperature is approximately 60 degrees Fahrenheit (°F) (Monterey County, 2008). Rainfall occurs primarily between November and April. Average annual rainfall in the county is approximately 18 inches.

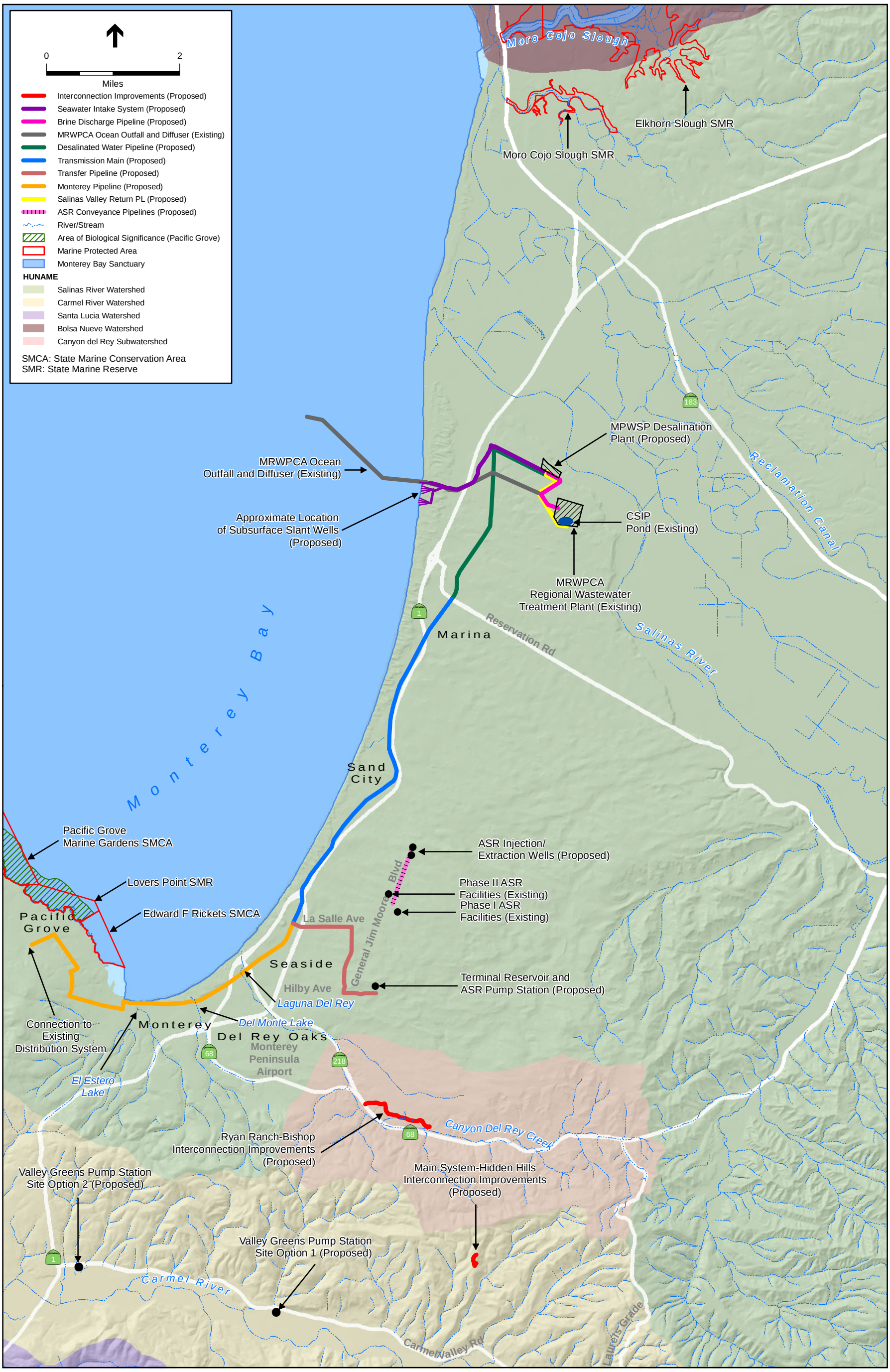
The project area lies within the southern portion of the Coast Ranges province. The topography in this province is dominated by a rugged coastline and the Diablo, Gabilan, and Santa Lucia mountain ranges with peaks of up to 5,844 feet above mean sea level (msl). Elevations in the project area range from approximately 10 feet above msl in the CEMEX active mining area to roughly 300 feet above msl along General Jim Moore Boulevard in Seaside. The topography of the project area results in part from the gently to moderately rolling sand dunes that are present along the coastal areas in the north to the city of Monterey in the south. Active, wind-blown dunes generally extend less than a 0.5-mile inland, and older, more stabilized dunes extend up to 4 miles inland.

4.3.1.2 Regional Surface Water Hydrology

The project area is located in the Salinas River and Carmel River watersheds (see **Figure 4.3-1**), which are discussed below. The headwaters of the Salinas and Carmel Rivers, the primary watercourses in the region, originate in the Santa Lucia and Gabilan Mountains (Monterey County, 2008). In general, the overall drainage pattern in the county is from southeast to northwest. The Salinas River drains into Monterey Bay and the Carmel River drains into Carmel Bay. A third major watershed in the region, the Pajaro River watershed, lies north of the project area and includes the Elkhorn Slough sub-watershed. The Pajaro River enters Monterey Bay at the northern tip of Monterey County. The Pajaro River Watershed lies north of and outside of the project area and is not discussed further.

Salinas River Watershed

With the exception of the Main System-Hidden Hills Interconnection Improvements and the Valley Greens Pump Station (both site options), all of the proposed project facilities would be located in the Salinas River watershed. The Salinas River drains approximately 3,950 square miles and has the largest drainage area in Monterey County. The Salinas River watershed is bounded by the Santa Lucia Mountains to the west and the Gabilan Mountains to the east (Monterey County, 2008). Historically, the Salinas River joined with Elkhorn Slough in Moss Landing prior to discharging into Monterey Bay; this river segment is now referred to as the Old Salinas River. Today, the Salinas River drains directly into Monterey Bay approximately 4 miles south of Moss Landing (CCoWS, 2006). In the project area, within the Salinas River watershed, the Canyon del Rey sub-watershed extends east of Monterey and Seaside (see **Figure 4.3-1**). The Canyon del Rey sub-watershed covers approximately 13.8 square miles and is located along the Seaside/Del Rey Oaks/Highway 68 corridor (Monterey County, 2010b). Canyon Del Rey Creek discharges seasonally to Monterey Bay via Laguna del Rey.



SOURCE: DWR, 2004; SWRCB, 2005; NOAA, 2012

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Figure 4.3-1

Surface Water Resources in the Project Area

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Average annual flows to the ocean from the Salinas River are around 282,000 acre-feet per year, most of which occurs from November through March. This period corresponds to the months of peak seasonal rainfall and coincides with a seasonal drop in irrigation in the valley (Monterey County, 2008). The Salinas River hydrology during the dry season is largely determined by water releases from the Nacimiento and San Antonio reservoirs. During spring and summer, operation of the two reservoirs regulates flow to minimize ocean outflow and maximize groundwater recharge through the Salinas River bed (Kozlowski et al., 2004). Water from the reservoirs[1] is used for groundwater recharge and managed so that the flows reach the lower Salinas River and percolate without being lost to the ocean (Kozlowski et al., 2004).

Carmel River Watershed

The Carmel River watershed covers an area of 255 square miles. From its headwaters in the Santa Lucia Mountains, the Carmel River flows for 36 miles eventually draining into Carmel Bay just south of the city of Carmel-by-the-Sea (Monterey County, 2010b). 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 Main System-Hidden Hills Interconnection Improvements and both site options of the Valley Greens Pump Station would lie within the Carmel River watershed.

Monterey Bay

The Monterey Bay is a bay of the Pacific Ocean on California's Central Coast extending between the cities of Santa Cruz and the Monterey Peninsula. The shoreline of Monterey Bay is composed primarily of less resistant sand dune and sedimentary deposits that form the ancient sand dune terraces and provide the opportunity for farmland around the communities of Watsonville, Castroville, Marina, Sand City, and Seaside.

The primary freshwater input to Monterey Bay is through Salinas River and Carmel River but other water bodies such as the Moro Cojo Slough feed into the Monterey Bay (see **Figure 4.3-1**). Beneath the Monterey Bay, the Monterey Submarine Canyon begins at Moss Landing and extends 95 miles west into the Pacific Ocean.

4.3.1.3 Surface Water Quality

The quality of surface water is primarily a function of land uses in the project area. Pollutants and sediments are transported in watersheds by stormwater runoff that reaches streams, rivers, storm drains, and reservoirs. Local land uses influence the quality of the surface water through point source discharges (i.e., discrete discharges such as an outfall) and nonpoint source discharges (e.g., storm runoff). Some of the most prominent water quality problems in the project area are erosion and sedimentation, pollutants in urban runoff, nitrate contamination, and inorganic and secondary constituents (Monterey County, 2010b). Surface water quality for the two primary watersheds in the project area and Monterey Bay is described below.

[1] This does not include the modifications to the Nacimiento Dam spillway and operation of the rubber dam associated with the Salinas Valley Water Project.

Salinas River and Carmel River Watersheds

Urban runoff has the potential to directly affect water quality in the Salinas River and in Monterey Bay (Monterey County, 2008). As further discussed in Section 4.3.2.1, below, the lower Salinas River water quality is impaired by pesticides and nutrients. Relatively less urbanization has occurred in the Carmel River watershed as compared to the Salinas River watershed. However, because most of the urban uses are close to the river, they present the potential for direct impacts on surface water quality. According to a Carmel River Watershed Conservancy[2] monitoring report (2004), excess sediment in the Carmel River occurs due to various land uses and road designs.

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, and that are anticipated to be regulated in the future, by the State Water Resources Control Board (SWRCB) and the Central Coast Regional Water Quality Control Board (RWQCB) (see Regulatory Framework, below, for additional information regarding water quality regulations). The ocean climate that affects water quality in Monterey Bay is also described. This EIR considers the reported ambient constituent levels to be the baseline concentrations; these are used later in this section to assess the proposed project's impacts on water quality.

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[3] when upwelling[4] is strong. 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). Bograd and Lynn (2003) compared near-shore salinity and temperatures in Monterey Bay during two periods: 1950-1976 and 1977-1999. The difference in near-shore salinities between the periods was approximately 0.2 parts per thousand (ppt) or psu[5] and the difference in near-shore temperatures was approximately 1.4 °F.

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). The *Water Quality Control Plan for Ocean Waters of California* (or Ocean Plan, discussed below in Section 4.3.2.2) sets the water quality objective for DO at 5 mg/L.

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2 The Carmel River Watershed Conservancy monitors the health of the Carmel River watershed resources including creeks, streams, and wildlife habitat.
3 Unit used to measure salinity in terms of the concentration of dissolved salts in water.
4 Upwelling is the process by which the warmer water at the ocean surface is pushed away by wind and replaced by colder, denser water that rises up from the subsurface.
5 The unit ppt is equivalent to psu.

Other Constituents

The waters of Monterey Bay contain numerous legacy pesticides[6] such as organochlorine pesticides. Dieldrin and dichloro-diphenyl-trichloroethane (DDT) as well as chemical products in current use such as organophosphate pesticides, polynuclear aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) are found in Monterey Bay. The largest source of contaminants is agricultural runoff into the San Lorenzo, Pajaro, Salinas, and Carmel Rivers. Seasonal data collected by the Central Coast Long-term Environmental Assessment Network[7] (CCLEAN) between 2001 and 2010 indicate numerous instances where water quality criteria and human health alert levels in Monterey Bay were exceeded due to presence of contaminants (CCLEAN, 2011). Nearshore waters of Monterey Bay have exceeded the Ocean Plan objective for PCBs, dieldrin and DDTs for the protection of human health in 23, 5 and 2 samples out of 34, respectively. PCBs at the North Monterey Bay site have increased significantly since 2006 and annual average concentrations across all samples have increased exponentially (CCLEAN, 2014). Annual data reported 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)[8] for most of the years between 2004 and 2013.

Monterey Bay also receives point source discharges from pipelines and other structures. These permitted discharges are subject to prohibitions and water quality requirements established by the Central Coast RWQCB such as effluent limitations, periodic monitoring, annual reporting, and other requirements designed to protect the overall water quality of Monterey Bay. In the project area, 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 Monterey Regional Water Pollution Control Agency (MRWPCA) Regional Wastewater Treatment Plant located on Charles Benson Road in Marina. Another permitted point discharge in Monterey Bay is located 7 miles north of the project area in Moss Landing and is operated by Dynegy.[9]

Monterey Bay Ocean Climate

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: (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

6 Legacy pesticides are persistent pesticides that have been banned from use but are still commonly found in the environment.

7 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).

8 This objective for protection of human health is listed in the Ocean Plan and is discussed further in Section 4.3.2.1, State Regulatory Framework, below.

9 Based on *Waste Discharge Requirements Order No. 00-041 NPDES No. CA0006254* issued to Duke Energy North America Moss Landing Power Plant (RWQCB, 2000).

mid-February. These three individual seasons overlap extensively and do not recur with exact consistency. For further information on ocean climate seasons see **Appendix D1**.

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 up Monterey Submarine Canyon. 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 (SWRCB, 2012a).

The third factor, physical features, refers to regional bathymetry[10] 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 percent 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.

4.3.1.4 Flooding

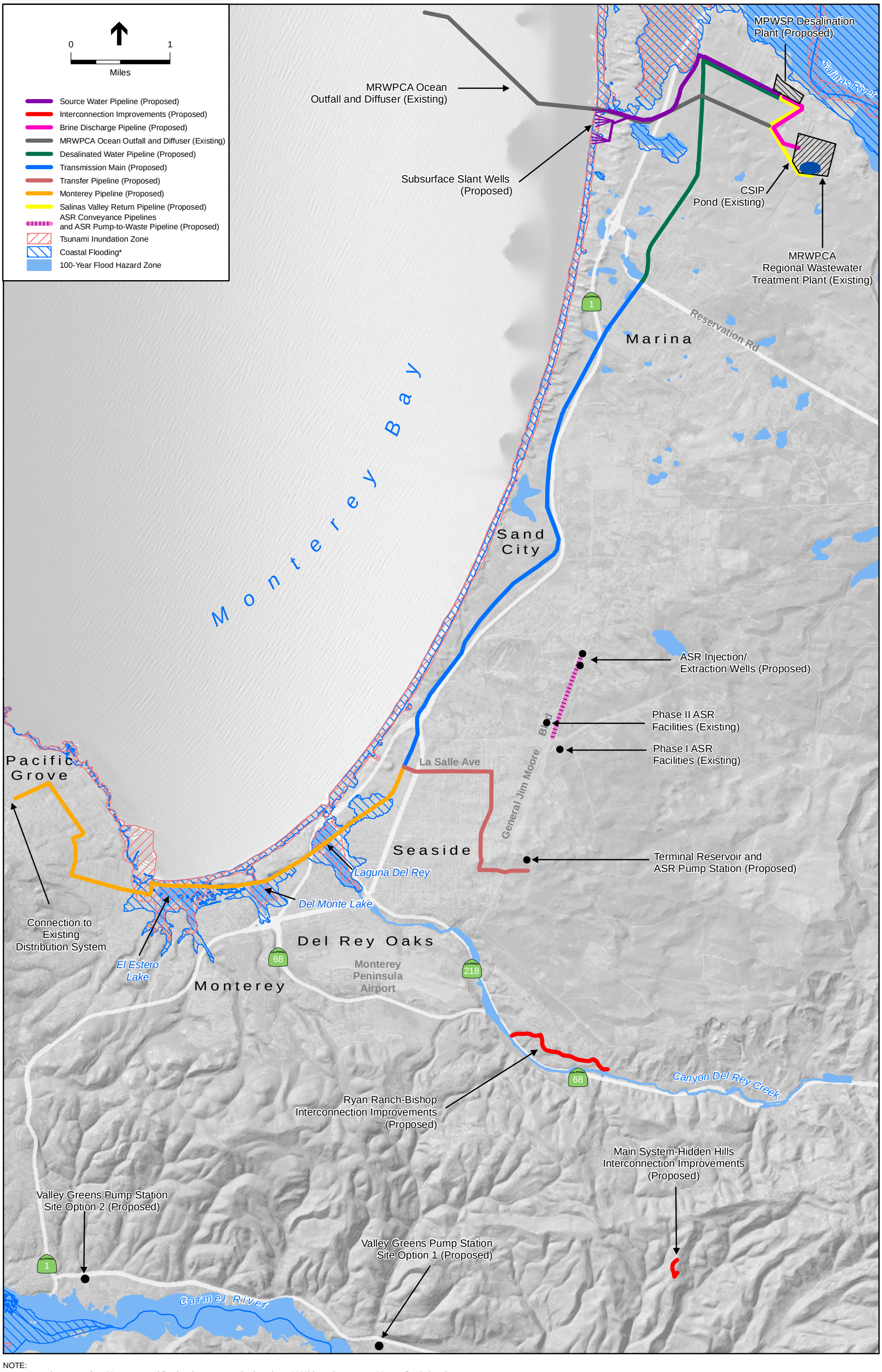
Flooding can occur when excessive precipitation generates stormwater runoff that exceeds the carrying capacity of the drainage system. Flooding can also occur due to dam or levee failure, tsunamis, and/or sea level rise.

Flood Hazard Zones

The Federal Emergency Management Agency (FEMA) delineates regional flooding hazard areas in Monterey County as part of the National Flood Insurance Program. Official Flood Insurance Rate Maps (FIRMs) for the project area indicate areas that have a 1 percent chance of flooding in any given year (100-year flood hazard zone). The 100-year flood hazard zones along the coast experience flooding coincident with high tide events typically combined with a wintertime storm surge. Significant flood events occurred in Monterey County in January 1995, March 1995, and February 1998 (MCWRA, 2013). During these events, major water bodies, including the Salinas River and Carmel River, experienced flooding and Monterey County was declared a federal disaster area.

In Seaside, Del Monte Boulevard from Playa Avenue to La Salle Avenue (near the proposed Transmission Main alignment) has experienced flooding conditions (City of Seaside, 2004a). Portions of the proposed Source Water Pipeline in Marina and the Monterey Pipeline in Seaside and Monterey are sited within a FEMA 100-year flood hazard zone. None of the other proposed facilities would be located within designated flood hazard areas (see **Figure 4.3-2**).

[10] National Oceanic and Atmospheric Administration (2014) refers to bathymetry as the ocean's depth relative to sea level, although it has come to mean "submarine topography," or the depths and shapes of underwater terrain.



NOTE:
*Represents the extent of a 100-year coastal flood under current projections (year 2000) based on FEMA 100-year flood elevations.

SOURCE: FEMA, 2009; Pacific Institute, 2009; CGS, 2009

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Figure 4.3-2

Flood Hazards in the Project Area

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Dam or Levee Failures

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 (Monterey District). However, the storage capacity of both dams has been reduced to less than 2 percent by the gradual accumulation of sediment over the years of operation. Removal of San Clemente Dam is currently underway (CCoWS, 2009; DWR, 2012; CalAm, 2013). Nacimiento and San Antonio Dams are owned and operated by the Monterey County Water Resources Agency (MCWRA).

The four dams are regulated by the design and operational requirements established by the California Division of Safety of Dams (DSOD) and are administered by Monterey County. 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 prepared by the Monterey County Office of Emergency Services (Monterey County, 2007). 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 (California Office of Emergency Services, 2011). Based on the County-wide dam inundation map, none of the proposed facilities would be located within a dam inundation zone (Monterey County, 2010b).

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 (Monterey County, 2007).

Tsunami Hazards

A tsunami is a large wave or series of waves generated by an earthquake, volcanic eruption, or coastal landslide. Tsunami damage is typically confined to low-lying coastal areas. The United States Geologic Survey (USGS) evaluated the potential community exposure to tsunami hazards along the California coastline, including Monterey Bay (Wood et. al., 2013). The report estimated the maximum onshore wave run-up[11] from a tsunami would reach an elevation of 18.37 feet[12] in the city of Monterey. This degree of run-up would inundate a large portion of the city. Seaside and the unincorporated areas near the mouth of the Salinas River could also be subject to large areas of inundation (see **Figure 4.3-2**). Following the tsunami in Japan in 2011, the maximum wave height at Monterey Harbor was recorded at 2.4 feet (Monterey County, 2014).

11 *Wave run-up* refers to the maximum vertical extent of a wave up rush on a beach or a structure.
12 The maximum onshore run-up elevation presented in the 2013 USGS report (Wood et. al., 2013) is based on modeled scenarios (for distant sources) and past events (for local sources).

The Monterey County Office of Emergency Services (OES) 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 (OES, 2010). According to the *Tsunami Incident Response Plan* prepared by the Monterey County OES and incorporated cities in the county, a locally generated tsunami may occur if a large enough earthquake occurs in or near Monterey Bay (OES, 2007). 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, though still relatively unlikely compared to other hazards, is from a distant event, where there would be more than one hour to respond to a tsunami warning. The Tsunami Incident Response Plan lists individual response areas along the Monterey County and outlines the response agencies, evacuation routes, routes to avoid, safe areas, and special considerations for neighboring areas.

Coastal Flooding and Sea Level Rise

Coastal flooding can occur when there is a short- or long-duration increase in sea level during a period of extreme precipitation and runoff. Wave run-up along the coastal areas of Monterey County also contributes to coastal flooding. Wave run-up may cause coastal erosion by directly impacting coastal bluffs, dislodging material, and redistributing it to the foreshore and near-shore. Storms in the Pacific Ocean in the months of November through February, in conjunction with high tides and strong winds, can cause significant wave run-up. In addition to intense offshore storms, seismically-induced waves (i.e., tsunamis) can cause coastal flooding and although rare, can occur at any time of the year.

Coastal flooding can be exacerbated by the physical characteristics of the continental shelf and shoreline. As part of the California Coastal Analysis and Mapping Project, FEMA is conducting the Open Pacific Study, a detailed coastal engineering analysis and mapping of the Pacific Coast of California. The results of the study will be used to remap the coastal flood risk and wave hazards for the California coastline, including Monterey County (FEMA, 2013).

Sea level rise at a global level is a phenomenon generally attributed to global climate change. Climate change is expected to result in more extreme weather events, both heavier precipitation events that can lead to flooding as well as more extended drought periods. According to a report by the Intergovernmental Panel on Climate Change (IPCC), the global average sea level rose at an average rate of 1.8 millimeters (0.07 inch) per year over 1961 to 2003 and at an average rate of about 3.1 millimeters (0.12 inch) per year from 1993 to 2003 (IPCC, 2007).The more recent Assessment Report predicts mean sea level to rise by 7 meters (23 feet) globally by 2099 (IPCC, 2014).[13]

The National Research Council estimates sea level in California to rise by 4.6 to 24 inches by 2050 and 17 to 66 inches by 2100 (NRC, 2012). The Pacific Institute report (2009) predicts that sea level rise along the California coast could increase by 55 inches by 2100. This projection may be an underestimation because the climate models used did not account for ice-melt from Antarctica and Greenland (Pacific Institute, 2009). Based on monthly mean sea level data from 1973 to 2006, the

[13] Assuming near-complete loss of the Greenland ice sheet would occur over a millennium or more (IPCC, 2014; p.12).

mean sea level in Monterey Bay is increasing by approximately 1.35 millimeters (0.053 inches) per year (NOAA, 2013a). Sea level rise will likely increase the rate of coastal erosion and related coastal hazards (see Section 4.2, Geology, Soils, and Seismicity, and Section 4.4, Groundwater Resources, for more information regarding coastal erosion and coastal hazards). As shown in **Figure 4.3-3**, within the project area, portions of the proposed Source Water Pipeline and the subsurface slant wells in Marina, and portions of the proposed Monterey Pipeline in Monterey and Seaside, would lie in areas that would be subject to coastal flooding and sea level rise.

4.3.2 Regulatory Framework

4.3.2.1 Federal Regulations

Clean Water Act

Under the Clean Water Act (CWA) of 1977, the United States Environmental Protection Agency (USEPA) seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters by implementing water quality regulations. The National Pollutant Discharge Elimination System (NPDES) permit program under section 402(p) of the CWA controls water pollution by regulating sources that discharge pollutants into waters of the United States. The USEPA has delegated authority of issuing NPDES permits in California to the California State Water Resources Control Board, which has nine regional boards. The Central Coast RWQCB regulates water quality in the project area.

Section 303(d) List of Impaired Water Bodies and Total Maximum Daily Loads

Section 303(d) of the CWA requires that each State identify water bodies or segments of water bodies that are "impaired" (i.e., do not meet one or more of the water quality standards established by the state, even after point sources of pollution have been equipped with the minimum required levels of pollution control technology). Inclusion of a water body on the Section 303(d) List of Impaired Water Bodies triggers development of a Total Maximum Daily Load (TMDL) for that water body and a plan to control the associated pollutant/stressor on the list. The TMDL is the maximum amount of a pollutant/stressor that a water body can assimilate and still meet the water quality standards. Typically, a TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources.

Table 4.3-1 lists the impaired water bodies in the project area, including the pollutants that cause the impairments, and the potential sources of the pollutants.

National Marine Sanctuaries Act

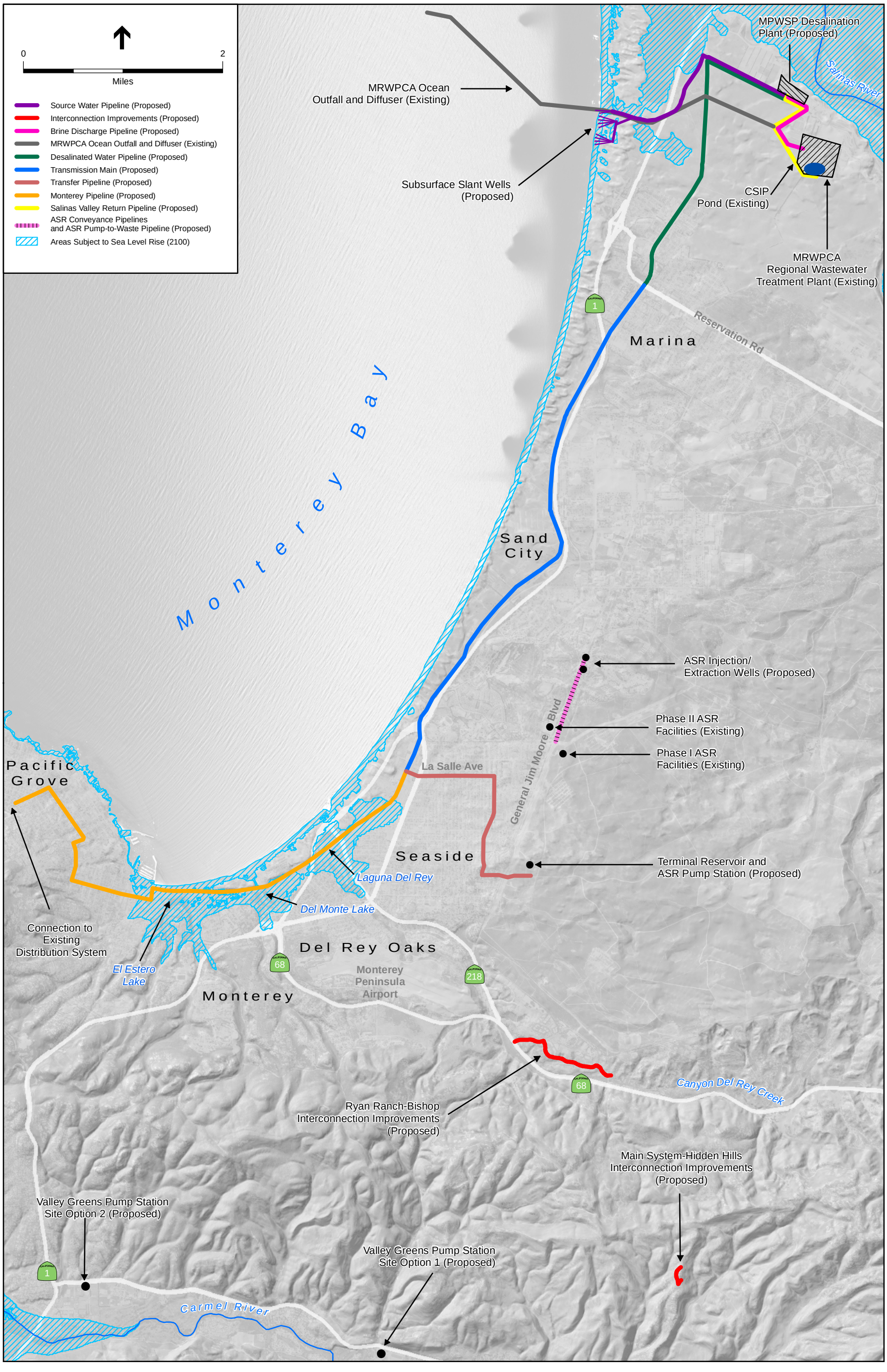
The National Marine Sanctuaries Act authorizes the U.S. Secretary of Commerce to designate and protect areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, or aesthetic qualities as national marine sanctuaries. The primary objective of the National Marine Sanctuaries Act is to protect marine resources, such as coral reefs, sunken historical vessels or unique habitats. Day-to-day management of national marine sanctuaries has been delegated to the National Oceanic

TABLE 4.3-1
303(d) LIST OF IMPAIRED WATER BODIES IN THE PROJECT VICINITY

Impaired Water Bodies	Pollutants	Potential Source Category
Salinas Reclamation Canal	Ammonia (unionized), chlorpyrifos, diazinon, copper, nitrates	Agriculture, urban runoff
	Fecal coliform	Agriculture, urban runoff, natural sources
	Low dissolved oxygen, sediment toxicity, turbidity, unknown toxicity, pH	Agriculture, urban runoff, habitat modification
	Pesticides	Agriculture, industrial wastewater, unspecified nonpoint source
	Priority organics	Agriculture, industrial wastewater, unspecified nonpoint source, urban runoff, unknown source
Lower Salinas River (Estuary to near Gonzales Road crossing)	Chlordane, PCBs, sodium, total dissolved solids (TDS), toxaphene, pH, dieldrin, DDD, electrical conductivity	Unknown source
	Chlorpyrifos, diazinon, nitrate, turbidity, unknown toxicity	Agriculture, urban runoff
	Chloride	Agriculture, urban runoff, natural sources
	Enterococcus	Agriculture, urban runoff, natural sources, unpermitted discharges, miscellaneous
	E. coli	Natural sources, miscellaneous
	Fecal coliform	Agriculture, urban runoff, natural sources, miscellaneous
	Pesticides	Construction/ land development, agriculture, urban runoff, unspecified point source
Salinas River (Middle from near Gonzales Road crossing to confluence with Nacimiento River)	E. coli	Agriculture, urban runoff, natural sources, construction/ land development
	Fecal coliform, pH	Agriculture, urban runoff, natural sources
	Pesticides	Agriculture, unspecified nonpoint source
	Water temperature, turbidity, unknown toxicity	Agriculture, urban runoff
Salinas River Lagoon (North)	Nutrients	Unspecified nonpoint source
	Pesticides	Agriculture
Monterey Bay Harbor	Metals	Resource extraction
	Sediment toxicity	Unknown source

SOURCE: RWQCB, 2010.

and Atmospheric Administration (NOAA) Office of National Marine Sanctuaries. Monterey Bay borders the project area (see **Figure 4.3-1**) along the coast and forms a part of the Monterey Bay National Marine Sanctuary (MBNMS), a federally protected marine area located along California's central coast. Stretching from Marin to Cambria, the MBNMS encompasses a shoreline length of 276 miles and 6,094 square miles of ocean. The MBNMS is part of a system of 13 National Marine Sanctuaries administered by NOAA.



SOURCE: Pacific Institute, 2009

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Figure 4.3-3

Areas Subject to Sea Level Rise in the Project Area

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Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972 provides for management of the nation's coastal resources, including the Great Lakes, and balances economic development with environmental conservation. In 1990, Congress passed the Coastal Zone Act Reauthorization Amendments (CZARA) to address nonpoint source pollution problems in coastal waters. The California Coastal Commission has jurisdiction for CZMA implementation throughout the state.[14]

Section 6217 of CZARA and Section 319 of the CWA require California and 28 other states to develop coastal nonpoint source pollution control programs that incorporate required management measures to reduce or prevent polluted runoff to coastal waters from specific sources. Management measures are defined in Section 6217 of the CZARA as economically achievable measures to control the addition of pollutants to coastal waters, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. These management measures are incorporated by states into their coastal nonpoint source pollution programs (USEPA, 1993). (See Section 4.3.2.2, below, for additional discussion of how the CZMA is regulated at the state level.)

Executive Order 11988 and National Flood Insurance Program

Under Executive Order 11988, FEMA is responsible for management of floodplain areas defined as the lowland and relatively flat areas adjoining inland and coastal waters subject to a one percent or greater chance of flooding in any given year. Also, FEMA administers the National Flood Insurance Program, which requires that local governments covered by federal flood insurance enforce a floodplain management ordinance that specifies minimum requirements for any construction within the 100-year flood zone (one percent chance of occurring in a given year). FEMA prepares Flood Insurance Rate Maps (FIRMs) that that indicate areas prone to flooding. MCWRA is responsible for issuing permits within designated flood zones in the project area. Local municipalities are responsible for permitting development on floodplains within their jurisdictions.

4.3.2.2 State Regulations

Porter-Cologne Water Quality Control Act

The Porter-Cologne Act (Division 7 of the California Water Code) provides the basis for water quality regulation within California and 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 California SWRCB 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 CWA, which establishes effluent limitations and water quality requirements for discharges to waters of the state. The Basin Plan for the Central Coast and the NPDES permits are discussed further below.

[14] Except within the San Francisco Bay-Delta where the Bay Conservation and Development Commission has authority for implementation of CZMA within its jurisdictional area.

California Toxics Rule

Under the California Toxics Rule (CTR), the USEPA has proposed water quality criteria for priority toxic pollutants for inland surface waters, enclosed bays, and estuaries. These federally promulgated criteria create water quality standards for California waters. The CTR satisfies CWA requirements and protects public health and the environment. The USEPA and the SWRCB have the authority to enforce these standards, which are incorporated into the NPDES permits (discussed in the local regulatory section) that regulate existing discharges in the project area.

California Coastal Act

The California Coastal Act, established in 1976, defines the "coastal zone" as the area of the state that extends generally 3,000 feet inland and three statute miles seaward (California Resources Agency, 1997). The California Coastal Act includes policies intended to protect water quality and established the California Coastal Commission. Almost all development within the coastal zone requires a coastal development permit from the California Coastal Commission or a local agency with a certified Local Coastal Program.

Monterey County and the cities of Marina, Sand City, Seaside, and Pacific Grove have adopted Local Coastal Programs to implement the California Coastal Act. By adopting a Local Coastal Program, the local jurisdiction assumes the authority and responsibility to implement the California Coastal Act. The City of Monterey does not have a certified local coastal program but has obtained certification of coastal land use plans for four of its five coastal zone subareas.[15] The California Coastal Commission retains jurisdiction for issuance of Coastal Development Permits within the city's coastal zone and the California Coastal Act remains the standard of review for Coastal Development Permit applications; the City's certified land use plan policies serve as guidance, where applicable. Refer to Section 4.8, Land Use, Land Use Planning, and Recreation for details on all the applicable Local Coastal Programs policies and regulations.

State Marine Sanctuary Regulations

As discussed in Section 4.3.1, MBNMS is one of the 13 National Marine Sanctuaries administered by NOAA. NOAA entered into a Memorandum of Agreement with the State of California, USEPA, and the Association of Monterey Bay Area Governments, which includes the following water quality regulations applicable to State waters within the MBNMS (MBNMS, 2013a):

- NPDES permits issued by the State of California under Section 13377 of the California Water Code;
- 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 in the MBNMS in coordination with the State permit program. The MBNMS Superintendent

[15] The four coastal zone subareas include Cannery Row, Del Monte Beach, the Harbor, and Skyline. The Laguna Grande/Roberts Lake Coastal Land Use Plan remains to be certified.

develops and follows a management plan that ensures protection of these resources, provides for research and education, and facilitates recreational and commercial uses, which are compatible with the primary goal of resource protection. The MBNMS also implements the Water Quality Protection Program to enhance and protect the chemical, physical, and biological integrity of the sanctuary. The program is a partnership of 27 local, state, and federal government agencies and calls for education, funding, monitoring, and development of treatment facilities and assessment programs to protect water quality (MBNMS, 2013b).

Within the MBNMS, there are three conservation areas (shown in **Figure 4.3-1**): Pacific Grove State Marine Conservation Area, Edward F. Ricketts State Marine Conservation Area, and Lovers Point State Marine Reserve, designated as such under the Marine Life Protection Act and administered by the California Department of Fish and Wildlife, further discussed in Section 4.5, Marine Resources.

Ocean Plan

The *Water Quality Control Plan for Ocean Waters of California* (or Ocean Plan) adopted by the SWRCB in October 2012 and effective August 2013 (2012b) 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 establishes effluent quality requirements and management principles for specific waste discharges. The water quality requirements and objectives are incorporated into NPDES permits for ocean discharges, such as the *Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant* (Order No. R3-2014-0013, NPDES Permit No. CA0048551) for discharges of treated wastewater from the MPWPCA Regional Wastewater Treatment Plant to Monterey Bay (MRWPCA's NPDES permit is discussed in more detail below).

The 2012 Ocean Plan includes the following provisions that are applicable to the proposed project:

- 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 prohibits discharges into the ocean including Areas of Special Biological Significance (ASBS). ASBS are designated by the SWRCB and require protection of species or biological communities to the extent that alteration of natural water quality is undesirable (see **Table 4.3-2**). **Table 4.3-2** below lists the water bodies in the project area that are designated as ASBS along with other beneficial uses identified by the Central Coast RWQCB for water bodies in the project vicinity. In the Monterey region, Old Salinas River Estuary, Pacific Grove, Carmel Bay, and Point Lobos are designated as ASBS and are located near Monterey Bay (SWRCB, 2013a), of which Monterey Bay and Carmel Bay lie in the project vicinity.

TABLE 4.3-2
DESIGNATED BENEFICIAL USES OF SURFACE WATER BODIES IN THE PROJECT VICINITY

Water Bodies	Beneficial Uses																			
	MUN	AGR	GWR	IND	COMM	SHELL	COLD	EST	MIGR	RARE	SPWN	BIOL	WARM	WILD	REC-1	REC-2	NAV	MAR	FRSH	ASBS
Salinas Reclamation Canal					X								X	X	X	X				
Tembladero Slough					X	X		X		X	X		X	X	X	X				
Old Salinas River Estuary					X	X	X	X	X	X	X	X	X	X	X	X				
Salinas River Lagoon (North)					X	X	X	X	X	X	X	X	X	X	X	X				
Pacific Ocean (Monterey Bay)				X	X	X			X	X	X			X	X	X	X	X		X
Carmel River	X	X	X	X	X		X		X	X	X	X	X	X	X	X			X	
Carmel River Estuary			X		X	X	X	X	X	X	X	X		X	X	X				
Carmel Bay				X	X	X				X					X	X		X		X

ACRONYMS:

MUN – Municipal and Domestic Supply
AGR – Agricultural Supply
GWR – Groundwater Recharge
IND – Industrial Service Supply
COMM – Ocean, Commercial, and Sport Fishing
SHELL – Shellfish Harvesting
COLD – Cold Freshwater Habitat
MIGR – Migration of Aquatic Organisms,
EST – Estuarine Habitat
REC-2 – Non-Contact Water Recreation
RARE – Preservation of Rare and Endangered Species
WILD – Wildlife Habitat
FRSH – Freshwater Replenishment
ASBS – Areas of Special Biological Significance
NAV – Navigation
REC-1 – Water Contact Recreation
WARM – Warm Freshwater Habitat
SPWN – Spawning, Reproduction, and/or Early Development
BIOL – Preservation of biological Habitats of Special Significance

SOURCE: RWQCB, 2011b; 2014.

To protect the beneficial uses of the surface water bodies shown in **Table 4.3-2**, the Ocean Plan establishes water quality objectives for bacterial, physical, chemical, biological, and radioactive constituents listed in **Table 4.3-3**.

The 2012 Ocean Plan allows for a mixing zone or a zone of initial dilution (ZID) where receiving water is allowed to exceed a water quality objective or receiving water limit (SWRCB, 2012b). A discharge is generally required to meet the relevant water quality standards at the edge of the ZID (Flow Science, Inc., 2014).

The size of the ZID is defined in the Ocean Plan (2012) as the point where initial dilution is achieved. In general, the ZID is defined by the physical characteristics of a discharge, and is limited to the area where the waste undergoes turbulent mixing (SWRCB, 2015). The federal definition of a ZID refers to a mixing zone as follows: “Mixing zone means the zone extending from the sea’s surface to seabed and extending laterally to a distance of 100 meters in all directions from the discharge point(s) or to the boundary of the ZID as calculated by a plume model approved by the director, whichever is greater, unless the director determines that the more restrictive mixing zone or another definition of the mixing zone is more appropriate for a specific discharge” (SWRCB, 2012b).

TABLE 4.3-3
WATER QUALITY OBJECTIVES IN THE 2012 OCEAN PLAN

Water Quality Objectives for Protection of Marine Life				
		Limiting Concentrations		
	Units of Measurement	**6-month Median**	**Daily Maximum**	**Instantaneous Maximum**
Arsenic	µg/L	8	32	80
Cadmium	µg/L	1	4	10
Chromium (Hexavalent)	µg/L	2	8	20
Copper	µg/L	3	12	30
Lead	µg/L	2	8	20
Mercury	µg/L	0.04	0.16	0.4
Nickel	µg/L	5	20	50
Selenium	µg/L	15	60	150.
Silver	µg/L	0.7	2.8	7
Zinc	µg/L	20	80	200
Cyanide	µg/L	1	4	10
Total Chlorine Residual	µg/L	2	8.0	60
Ammonia (expressed as Nitrogen)	µg/L	600	2400	6000
Acute Toxicity	TUa	N/A	0.3	N/A
Chronic Toxicity	TUc	N/A	1	N/A
Phenolic Compounds (non-chlorinated)	µg/L	30	120	300
Chlorinated Phenolics	µg/L	1	4	10
Endosulfan	µg/L	0.009	0.018	0.027
Endrin	µg/L	0.002	0.004	0.006
HCH	µg/L	0.004	0.008	0.012
Radioactivity	Not to exceed limits specified in Tile 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, Section 30253 of the California Code of Regulations.			

Water Quality Objectives for Protection of Human Health-Noncarcinogens		
	30-day Average (micrograms per liter or µg/L)	
Chemical	**Decimal Notation**	**Scientific Notation**
acrolein	220	2.2×10^{2}
antimony	1,200	1.2×10^{3}
bis(2-chloroethoxy) methane	4.4	4.4×10^{0}
bis(2-chloroisopropyl) ether	1,200	1.2×10^{3}
chlorobenzene	570	5.7×10^{2}
chromium (III)	190,000	1.9×10^{5}
di-n-butyl phthalate	3,500	3.5×10^{3}
dichlorobenzenes	5,100	5.1×10^{3}
diethyl phthalate	33,000	3.3×10^{4}
dimethyl phthalate	820,000	8.2×10^{5}
4,6-dinitro-2-methylphenol	220	2.2×10^{2}
2,4-dinitrophenol	4.0	4.0×10^{0}
ethylbenzene	4,100	4.1×10^{3}
fluoranthene	15	1.5×10^{1}
hexachlorocyclopentadiene	58	5.8×10^{1}
nitrobenzene	4.9	4.9×10^{0}
thallium	2	$2. \times 10^{0}$
toluene	85,000	8.5×10^{4}
tributyltin	0.0014	1.4×10^{-3}
1,1,1-trichloroethane	540,000	5.4×10^{5}

TABLE 4.3-3 (Continued)
WATER QUALITY OBJECTIVES IN THE 2012 OCEAN PLAN

Chemical	30-day Average (micrograms per liter or µg/L)	
	Decimal Notation	Scientific Notation
Water Quality Objectives for Protection of Human Health-Carcinogens		
acrylonitrile	0.10	1.0×10^{-1}
aldrin	0.000022	2.2×10^{-5}
benzene	5.9	5.9×10^{0}
benzidine	0.000069	6.9×10^{-5}
beryllium	0.033	3.3×10^{-2}
bis(2-chloroethyl) ether	0.045	4.5×10^{-2}
bis(2-ethylhexyl) phthalate	3.5	3.5×10^{0}
carbon tetrachloride	0.90	9.0×10^{-1}
chlordane	0.000023	2.3×10^{-5}
chlorodibromomethane	8.6	8.6×10^{0}
chloroform	130	1.3×10^{2}
DDT	0.00017	1.7×10^{-4}
1,4-dichlorobenzene	18	1.8×10^{1}
3.3'-dichlorobenzidine	0.0081	8.1×10^{-3}
1,2-dichloroethane	28	2.8×10^{1}
1,1-dichlorethylene	0.9	9×10^{-1}
dichlorobromomethane	6.2	6.2×10^{0}
dichloromethane	450	4.5×10^{2}
1,3-dichloropropene	8.9	8.9×10^{0}
dieldrin	0.00004	4.0×10^{-5}
2,4-dinitrotoluene	2.6	2.6×10^{0}
1,2-diphenylhydrazine	0.16	1.6×10^{-1}
halomethanes	130	1.3×10^{2}
heptachlor	0.00005	5×10^{-5}
heptachlor epoxide	0.00002	2×10^{-5}
hexachlorobenzene	0.00021	2.1×10^{-4}
hexachlorobutadiene	14	1.4×10^{1}
hexachloroethane	2.5	2.5×10^{0}
isophorone	730	7.3×10^{2}
N-nitrosodimethylamine	7.3	7.3×10^{0}
N-nitrosodi-N-propylamine	0.38	3.8×10^{-1}
N-nitrosodiphenylamine	2.5	2.5×10^{0}
Polyaromatic hydrocarbons (PAHs)	0.0088	8.8×10^{-3}
Polychlorinated biphenyls (PCBs)	0.000019	1.9×10^{-5}
TCDD equivalents	0.0000000039	3.9×10^{-9}
1,1,2,2-tetrachloroethane	2.3	2.3×10^{0}
tetrachloroethylene	2.0	2.0×10^{0}
toxaphene	0.00021	2.1×10^{-4}
trichloroethylene	27	2.7×10^{1}
1,1,2-trichloroethane	9.4	9.4×10^{0}
2,4,6-trichlorophenol	0.29	2.9×10^{-1}
vinyl chloride	36	3.6×10^{1}

SOURCE: SWRCB, 2012b.

The ZID is the zone immediately adjacent to the discharge where momentum and buoyancy-driven mixing produces rapid dilution of the discharge (Flow Science, Inc., 2014; SWRCB, 2012a). The mixing and dilution are also affected by the density of the effluent that is discharged. **Figure 4.3-4 (a)** illustrates the likely trajectories of a brine or an effluent plume from a horizontal discharge. As the effluent travels away from the discharge port, it entrains ambient seawater, which increases the diameter of the plume and decreases the plume concentration. The edge of the ZID depends on the discharge plume.

If the brine density is lower than the ambient salinity, it rises and becomes a buoyant plume **(Figure 4.3-4 (b))**. Here, the ZID may end at the point where the effluent plume reaches the water surface or attains a depth level where the density of the diluted effluent plume becomes the same as the density of ambient water (i.e., the "trap" level). The brine plume spreads within and beyond the trap level and forms a rising plume.

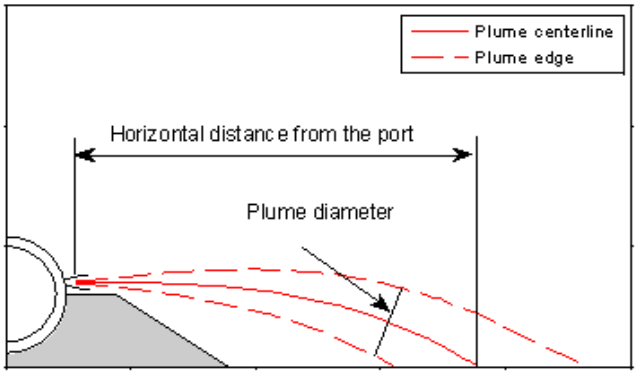
If the brine density is greater than the ambient salinity, it sinks and becomes a negatively buoyant plume **(Figure 4.3-4 (c))**. Here, the ZID may end at the point where the discharge plume impacts the seafloor. Typically, constituent concentrations are permitted to exceed water quality standards within the ZID, which is limited in size. Thus, in the case of MPWSP, the Ocean Plan water quality objectives would apply to the edge of the ZID (Flows Science, Inc., 2014 in **Appendix D2**).

In addition to establishing water quality objectives, the Ocean Plan lays out the implementation provisions with an equation to derive constituent concentrations that are compared with the water quality objectives. The constituent concentrations are calculated using the background concentrations of the constituents as one of the factors.[16] The Ocean Plan provides the background concentrations in *Table 3* (*page 14*; SWRCB, 2012b). The background concentrations are provided for only five constituents: arsenic, copper, mercury, silver, and zinc; and for other constituents it is assumed to be zero. These background seawater concentrations are thus generically prescribed for the entire coast of California and in the case of MPWSP, these may not necessarily accurately reflect the ambient concentrations near the MPWSP project area in Monterey Bay.

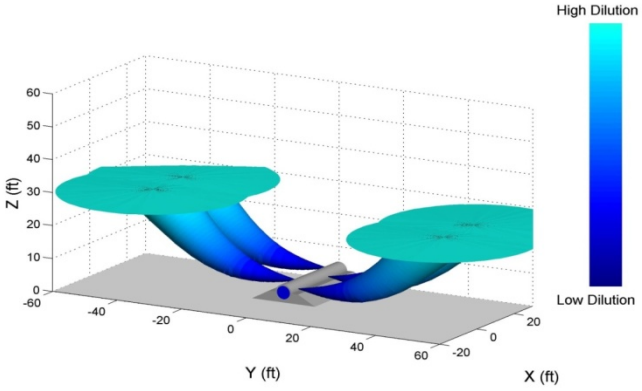
As discussed under Other Constituents in Section 4.3.1.3, Surface Water Quality above, near-shore water quality in Monterey Bay is monitored under CCLEAN. The CCLEAN program design includes some, and not all constituents that are regulated by the Ocean Plan (listed in **Table 4.3-3**).[17]A review of the most recent monitoring data reported under CCLEAN for the past 5 years (2008-2013) indicates exceedances of maximum concentrations of several constituents over the water quality objectives listed in **Table 4.3-4**. **Table 4.3-4** below provides the average and

[16] The calculation also uses the constituent concentrations and dilution factor estimated for the discharge that is studied.

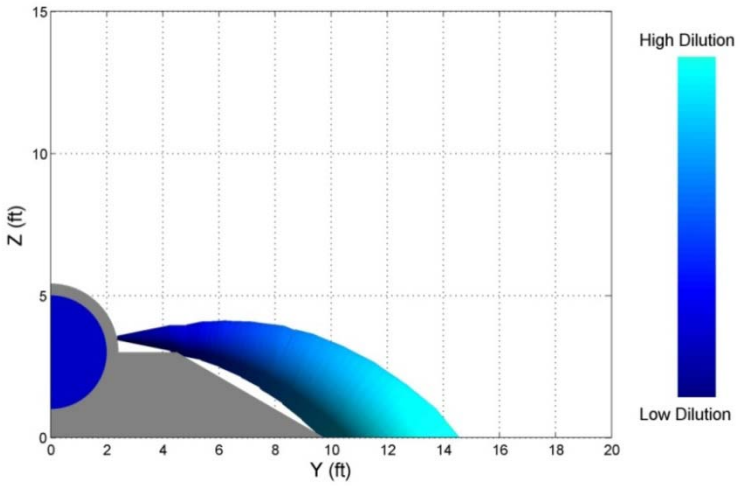
[17] The CCLEAN program was designed to protect ocean beneficial uses that were prioritized in surveys obtained from academic and regulatory agency scientists, recreational and business interests and local governments around Monterey Bay. Potential water quality stressors (or constituents) that could affect those beneficial uses were determined from published scientific articles and other reports, which enabled a program design to determine the sources, loads and effects of contaminants being discharged into the ocean (CCLEAN, 2012).



(a) Trajectory of a Plume Upon Discharge



(b) Illustration of a Rising Plume



(c) Illustration of a Sinking Plume

SOURCE: Flow Science, Inc., 2014 (see Appendix D2)

Figure 4.3-4
Illustrations of the Trajectory and Behavior of a Brine Discharge Plume

TABLE 4.3-4
WATER QUALITY IN MONTEREY BAY
(CONSTITUENT CONCENTRATIONS REPORTED UNDER CCLEAN 2008-2013)

Constituent	Reported Average Concentration	Reported Maximum Concentration	Ocean Plan Water Quality Objectives from Table 4.3-2a
Endosulfan	0.00000525	0.000039	0.009 (6-month median)
Endrin	0.00000025	0.000005	0.002 (6-month median)
HCH	0.0001673	0.000393	0.004 (6-month median)
Fluoranthene	0.00032278	0.00108	15 (6-month median)
Aldrin**	0.000019**	**0.000081****	0.000022 (30-day average)
Chlordane	0.00001935	**0.000114**	0.000023 (30-day average)
DDT	0.0000671	**0.00032**	0.00017 (30-day average)
Dieldrin	0.0000172	**0.000051**	0.00004 (30-day average)
Heptachlor	0.0000004	0.000005	0.00005 (30-day average)
Polyaromatic hydrocarbons (PAHs)	0.00246	0.0069	0.0088 (30-day average)
Polychlorinated biphenyls (PCBs)	**0.000132**	**0.00121**	0.000019 (30-day average)
Toxaphene**	**0.0015****	**0.0032****	0.00021 (30-day average)

* Concentrations higher than the Ocean Plan water quality objectives in Table 4.3-3 are shown in bold.
** Aldrin and toxaphene were not detected and hence they are reported here in the form of average and maximum of the available reporting limits, which exceed the Ocean Plan water quality objective.

SOURCE: Table based on data collected from near-shore Monterey Bay water quality monitoring (2008-2013) under CCLEAN received from Dane Hardin on June 3, 2014.

quality objectives listed in **Table 4.3-3** and notes the exceedances in bold. Aldrin and toxaphene were not detected therefore their respective method reporting limits were used to represent their concentrations.

As shown in **Table 4.3-4**, maximum concentrations detected in Monterey Bay for chlordane, dieldrin, DDT, and both average and maximum concentrations of PCBs currently exceed the Ocean Plan water quality objectives. In the case of aldrin and toxaphene, the average and maximum values of their respective method reporting limits were used to represent their concentrations; the reporting limits were higher than the water quality objectives. In the case of toxaphene, the average value of the range of reporting limits used also exceeded the water quality objectives. In summary, the background concentrations or ambient levels of constituents in Monterey Bay vary with time. Further, not all constituent concentrations are available and the data resolution may vary with the sampling methods (Luthy, 2015), therefore, availability of usable data was also a factor in the water quality analysis for the proposed project. The exceedances in **Table 4.3-4** are used as a conservative estimate using high-resolution data and are considered as baseline or existing water quality conditions in the bay in the impact analysis discussed in Section 4.3.3, Impacts and Mitigation Measures, below.

Point discharges, such as the brine discharge that would occur via the MRWPCA's ocean outfall with implementation of the MPWSP, are characterized in the Ocean Plan as "waste discharges." Currently, none of the Ocean Plan objectives are specifically applicable to waste discharges from desalination facilities. In the case of the proposed project, "the waste materials" would be the brine generated by the MPWSP Desalination Plant that would be discharged via the MRWPCA's ocean outfall.

The Ocean Plan does not currently have a water quality objective for elevated salinity levels in the ocean, nor does it describe how brine discharges are to be regulated and controlled. Currently, the RWQCBs regulate brine discharges from desalination facilities through the issuance of NPDES permits that contain conditions protective of beneficial uses of the receiving waters (SWRCB, 2014; 2015).

The SWRCB has been considering amending the Ocean Plan to address issues related to desalination in the waters of the Pacific Ocean adjacent to the California Coast outside of estuaries, coastal lagoons, and enclosed bays. To inform the amendments, the SWRCB contracted with the Southern California Coastal Water Research Project to evaluate methods of brine disposal and monitoring strategies, which resulted in a technical report on *Management of Brine Discharges to Coastal Waters* (SWRCB, 2012a).

On July 3, 2014, the SWRCB released the proposed Ocean Plan amendment[18] and an update thereafter on March 20, 2015. As part of the amendment, the SWRCB makes recommendations regarding seawater intake systems and brine discharge options, which will be considered for adoption in May 2015. The Ocean Plan amendment contains the following four primary components intended to control potential adverse impacts to marine life associated with desalination facility intakes using seawater as source water and brine discharges (SWRCB, 2014; 2015):

1. Clarify SWRCB's authority over desalination facility intakes and discharges;
2. Provide guidance to the regional water boards regarding the determination required by Water Code section 13142.5, subdivision (b) for the evaluations of the best available site, design, technology, and mitigation measures to minimize the intake and mortality of marine life at new or expanded desalination facilities.
3. A narrative receiving water limitation for salinity applicable to all desalination facilities to ensure that brine discharges to marine waters meet the biological characteristics' narrative water quality objective[19] and do not cause adverse effects to aquatic life beneficial uses.
4. Monitoring and reporting requirements that include effluent monitoring, as well as monitoring of the water column bottom sediments and benthic community health to ensure that the effluent plume is not harming aquatic life beyond the brine mixing zone.

The proposed amendment (SWRCB, 2015) discusses subsurface intake wells, which would be used as the proposed seawater intake system for the MPWSP. The SWRCB (2015) states, "subsurface intakes extract marine water from beneath the ground, filtering the seawater through

18 The amendment has not yet been adopted.
19 The 2012 Ocean Plan Section II. E (biological characteristics water quality objective) requires that, "marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded."

the geological features of the seafloor. Because the water is naturally filtered as it moves through sediments, it generally contains lower levels of contaminants such as suspended solids, silts, organic contaminants, oil, and grease. Similarly, subsurface intakes provide a natural barrier to suspended sediments, … dissolved or suspended organic compounds, …debris, or oil or chemical spills,…. This gives subsurface intakes a significant environmental advantage over surface water intakes compared to surface intakes, which will need mitigation to occur throughout the operational lifetime of the facility". This information is relevant in terms of the water quality or the constituent concentrations found in Monterey Bay where the seawater extracted from the bay through the subsurface intakes would be used as source water for the MPWSP Desalination Plant. The SWRCB acknowledges that slant wells also minimize aboveground shoreline structures and can provide substantially greater length of well screen in the target aquifer, an important advantage when there is limited aquifer thickness (SWRCB, 2015). The SWRCB recommends the option of using subsurface intakes as its preferred technology and allowing surface water intakes where subsurface intakes are found infeasible (SWRCB, 2015).

Concerning brine discharge from a desalination plant, SWRCB (2015) recommends the option to establish statewide requirements for use of the most protective best available brine discharge method feasible after a facility-specific evaluation. This option would require an owner or operator to first evaluate the availability and feasibility of diluting brine by commingling brine with wastewater. If wastewater is unavailable, then multiport diffusers are the next preferred method of brine disposal (SWRCB, 2015). The brine discharge from the MPWSP Desalination Plant is proposed to be discharged through a multiport diffuser of an existing outfall along with the wastewater that is currently discharged through the outfall, if the wastewater is available (see the water quality impact related to the brine discharge in Section 4.3.3, Impacts and Mitigation Measures, below).

In terms of water quality of the brine discharge, because the current Ocean Plan does not specifically discuss discharges from desalination plants, the proposed amendment (SWRCB, 2015) provides a guideline on the impact analysis for this project for salinity and for a suite of constituents that the current Ocean Plan regulates.

Salinity

Based on the studies of effects of brine discharges, the technical report developed by the Southern California Coastal Water Research Project (SWRCB, 2012a) recommended an incremental salinity limit at the mixing zone boundary of no more than 5 percent above the ambient background level. In California waters, this translates to an increase of 1.7 ppt (rounded to 2 ppt) of that occurring naturally in the waters around the discharge at the edge of the ZID. As discussed above, the ZID is defined as the zone immediately adjacent to a discharge where buoyancy-driven and momentum mixing produces rapid dilution of the discharge (SWRCB, 2012a). The SWRCB (2015) recommends a combination of the following two options on setting the salinity limit on brine discharges:

- Establish a narrative receiving water limit for salinity, to be measured no further than 100 meters horizontally from the discharge.

  - Here, the discharge shall not exceed a daily maximum of 2.0 ppt above natural background salinity to be measured no further than 100 meters (328 feet) horizontally from the discharge. There is no vertical limit to this zone;
  - The fixed distance referenced in the initial dilution definition shall be no more than 100 meters (328 feet);
  - In addition, the owner or operator shall develop a dilution factor based on the distance of 100 meters (328 feet) or initial dilution, whichever is smaller;

- Require an owner or operator to establish a facility-specific salinity receiving water limit to be measured no further than 100 meters horizontally from the discharge. Here, the regional water boards would require that each discharger of desalination brine waste examine the effects of that waste on select marine species in Table III-1 of the Ocean Plan and develop a facility-specific receiving water limit for salinity

The brine mixing zone will be defined as the area where the salinity exceeds 2.0 ppt above natural background salinity, or the concentration of salinity approved as part of an alternative receiving water limitation. The brine mixing zone therefore is an allocated impact zone where there may be toxic effects on marine life due to elevated salinity (SWRCB, 2015).

Other Constituents

In addition to salinity, the brine waste discharges can also contain other chemical constituents that may have reasonable potential to exceed an Ocean Plan Water Quality Objective listed in chapter II, Water Quality Objectives Table 1 in the 2012 Ocean Plan (SWRCB, 2015); which are shown in **Table 4.3-3** above. The impact analysis for the brine discharge from the MPWSP Desalination Plant for salinity and the rest of the constituents in Table 1 in the Ocean Plan (2012b) is presented in Section 4.3.3, Impacts and Mitigation Measures below.

Thermal Plan

The *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California* (or Thermal Plan) adopted by the SWRCB in 1995 establishes temperature requirements for existing and new discharges in California coastal waters, interstate waters, enclosed bays, and estuaries. Water quality objectives for existing discharges into coastal waters require that elevated temperature wastes comply with limitations necessary to assure protection of the beneficial uses and ASBSs (see also the discussion of the *Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant* [Order No. R3-2014-0013, NPDES Permit No. CA0048551], below, for discharges of treated wastewater from the Regional Wastewater Treatment Plant to Monterey Bay). The Thermal Plan defines new discharges as "discharges that are not presently taking place" and elevated temperatures wastes as "liquid, solid, or gaseous material including thermal waste[20] discharged at a temperature higher than the natural temperature of receiving water". The Thermal Plan establishes the following standards for all new discharges (SWRCB, 1995):

[20] Cooling water and industrial process water used for the purpose of transporting waste heat.

- The maximum temperature of thermal waste discharges shall not exceed the natural temperature of receiving waters by more than 20°F.
- The discharge of elevated temperature wastes shall not result in increases in the natural water temperature exceeding 4°F at the shoreline, the surface of any ocean substrate, or the ocean surface beyond 1,000 feet from the discharge system. The surface temperature limitation shall be maintained at least 50 percent of the duration of any complete tidal cycle.

During the non-irrigation season, the brine from the MPWSP Desalination Plant could be blended with treated wastewater from the MRPWCA's Regional Wastewater Treatment Plant, if available, prior to discharge via the MRWPCA outfall into Monterey Bay. The temperature requirements above are included in the MRWPCA's NPDES Permit (R3-2014-0013), discussed below, and would apply to brine-only discharges from the MPWSP Desalination Plant (during periods when there is no wastewater available for blending), as well as combined discharges (when the brine would be blended with the treated wastewater).

Anti-Degradation Policy

The SWRCB Anti-Degradation Policy, formally known as the Statement of Policy with Respect to Maintaining High Quality Water in California (SWRCB Resolution No. 68-16), restricts degradation of surface and ground waters. In particular, this policy protects water bodies where existing quality is higher than necessary for the protection of beneficial uses.

Under the Anti-Degradation Policy, any actions that can adversely affect water quality in all surface and ground waters must: (1) be consistent with maximum benefit to the people of California; (2) not unreasonably affect present and anticipated beneficial use of the water; and (3) not result in water quality less than that prescribed in water quality plans and policies. Furthermore, any actions that can adversely affect surface waters are also subject to the federal Anti-Degradation Policy (40 CFR Section 131.12) developed under the CWA. Discharges from the proposed project that could affect surface water quality would be required to comply with the Anti-Degradation Policy, which is included as part of the NPDES permit requirements for point discharges (discussed below).

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 (USEPA, 2012). 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);[21] 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 Old Salinas River Estuary, Salinas River, Carmel Bay, Point Lobos, and Pacific Grove (CCC, 2012).

Central Coast Water Quality Control Plan (Basin Plan)

The *Water Quality Control Plan for the Central Coast* (or Basin Plan) prepared by the Central Coast RWQCB (2011b) identifies the designated beneficial uses of surface waters in the Central Coast region (see **Table 4.3-2**). The Basin Plan establishes quantitative and qualitative water quality objectives for protection of the beneficial uses, and establishes policies to guide the implementation of these water quality objectives. In addition to the water quality objectives in the Ocean Plan (see **Table 4.3-3,** above), the following objectives apply to all ocean waters including Monterey Bay and Carmel Bay:

- Dissolved Oxygen: The mean annual dissolved oxygen concentration shall not be less than 7.0 mg/L, nor shall the minimum dissolved oxygen concentration be reduced below 5.0 mg/L at any time.
- pH: The pH value shall not be depressed below 7.0, nor raised above 8.5.
- Radioactivity: Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life; or result in the accumulation of radionuclides in the food web to an extent which presents a hazard to human, plant, animal, or aquatic life.

The water quality objectives are incorporated in the individual NPDES permits. For example the MRWPCA's NPDES Permit No. CA0048551 (Order No. R3-2014-0013) for discharges of treated wastewater from the Regional Wastewater Treatment Plant to Monterey Bay would be amended to include the brine discharge resulting from the proposed project.

NPDES Construction General Permit

Construction associated with the proposed project would disturb more than one acre of land surface affecting the quality of stormwater discharges into waters of the U.S. The proposed project would therefore be subject to the *NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities* (Order 2009-0009-DWQ, NPDES No. CAS000002) (Construction General Permit) (SWRCB, 2009). The Construction General Permit regulates discharges of pollutants in stormwater associated with construction activity to waters of the U.S. from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface. The permit regulates stormwater discharges associated with construction or demolition activities, such as clearing and excavation; construction of buildings; and linear underground projects (LUP), including installation of water pipelines and other utility lines.

Portions of the proposed project would fall under the Type 1 LUP category if the following conditions are met:

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

a) Construction occurs on unpaved improved roads, including their shoulders or land immediately adjacent to them;

b) The areas disturbed during a single construction day are returned to their preconstruction condition, or to an equivalent condition (i.e., disturbed soils such as those from trench excavation are hauled away, backfilled into the trench, and/or placed in spoils piles and covered with plastic), at the end of that same day;

c) Vegetated areas disturbed by construction activities are stabilized and revegetated at the end of the construction period; and

d) When required, adequate temporary soil stabilization best management practices (BMPs) are installed and maintained until vegetation has reestablished to meet the permit's minimum cover requirements for final stabilization.

The Construction General Permit requires that construction sites be assigned a Risk Level of 1 (low), 2 (medium), or 3 (high), based both on the sediment transport risk at the site and the receiving waters risk during periods of soil exposure (e.g., grading and site stabilization). The sediment risk level reflects the relative amount of sediment that could potentially be discharged to receiving water bodies and is based on the nature of the construction activities and the location of the site relative to receiving water bodies. The receiving waters risk level reflects the risk to the receiving waters from the sediment discharge. The Construction General Permit contains requirements for Risk Levels 1, 2 and 3, and the LUP Type 1, 2, and 3 categories. If a project does not meet any one or more of the aforementioned conditions under the Type 1 LUP category, depending on its location within a sensitive watershed area or floodplain, the level of receiving water risk could be considered low, medium, or high. Depending on the Risk Level, the construction projects could be subject to the following requirements:

- Effluent standards;
- Good site management "housekeeping";
- Non-stormwater management;
- Erosion and sediment controls;
- Run-on and runoff controls;
- Inspection, maintenance, and repair; and
- Monitoring and reporting requirements.

The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes specific BMPs designed to prevent pollutants from contacting stormwater and keep all products of erosion from moving offsite into receiving waters. The SWPPP BMPs are intended to protect surface water quality by preventing the off-site migration of eroded soil and construction-related pollutants from the construction area. Routine inspection of all BMPs is required under the provisions of the Construction General Permit. In addition, the SWPPP is required to contain a visual monitoring program, a chemical monitoring program for non-visible pollutants, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

The SWPPP must be prepared before the construction begins. The SWPPP must contain a site map(s) that delineates the construction work area, existing and proposed buildings, parcel boundaries, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the project area. The SWPPP must list BMPs and

the placement of those BMPs that the applicant would use to protect stormwater runoff. 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. Examples of typical construction BMPs include scheduling or limiting certain activities to dry periods, 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 Construction General Permit also sets post-construction standards (i.e., implementation of BMPs to reduce pollutants in stormwater discharges from the site following construction).

In the project area, the Construction General Permit is implemented and enforced by the Central Coast RWQCB, which administers the stormwater permitting program. Dischargers are required to electronically submit a notice of intent (NOI) and permit registration documents (PRDs) in order to obtain coverage under this Construction General Permit. Dischargers are responsible for notifying the RWQCB of violations or incidents of non-compliance, as well as for submitting annual reports identifying deficiencies of the BMPs and how the deficiencies were corrected.

The permit contains several additional compliance items, including: (1) additional mandatory BMPs to reduce erosion and sedimentation, which may include vegetated swales, setbacks and buffers, rooftop and impervious surface disconnection, bioretention cells, rain gardens, rain cisterns, implementation of pollution/ sediment/spill control plans, training, and other structural and nonstructural actions; (2) sampling and monitoring for non-visible pollutants; (3) effluent monitoring and annual compliance reports; (4) development and adherence to a Rain Event Action Plan; (5) requirements for post-construction; (6) numeric action levels and effluent limits for pH and turbidity; (7) monitoring of soil characteristics onsite; and (8) mandatory training under a specific curriculum.

The proposed project would be required to comply with the permit requirements to control stormwater discharges from the construction sites. To obtain coverage under the Construction General Permit, CalAm would be required to electronically file the NOI along with the PRDs, the SWPPP, risk assessment, site map, signed certification statement, and other compliance-related documents required by the Construction General Permit using the Stormwater Multiple Applications and Report Tracking Systems, along with the appropriate permit fee to SWRCB. The risk assessment and SWPPP must be prepared by a state-qualified SWPPP Developer and implementation of the SWPPP must be overseen by a state-qualified SWPPP Practitioner. A Legally Responsible Person, who is legally authorized to sign and certify PRDs, is responsible for obtaining coverage under the permit.

RWQCB Dewatering Requirements

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 dewatering effluent to the local

stormwater drainage system or to vegetated upland areas are conditionally exempt provided they meet the water quality criteria in the General Waste Discharge Requirements (General WDRs). 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 *General WDRs NPDES General Permit for Discharges with Low Threat to Water Quality* (Order No. R3-2011-0223, NPDES No. CAG993001) (RWQCB, 2011a) 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 the General WDRs include: discharges of dewatering effluent; 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 could be discharged to vegetated upland areas or to the local stormwater drainage system. 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.

Waiver of Waste Discharge Requirements

California Water Code Section 13269 authorizes the Central Coast RWQCB to waive WDRs 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 *General Waiver of WDRs for Specific Types of Discharges* (Resolution R3-2008-0010) (General Waiver) (RWQCB, 2008) contains specific conditions for the specific discharges and is consistent with the Central Coast 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.

Under the MPWSP, 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, 2008). The muds and clay slurry generated during the drilling and development of the subsurface slant wells and the proposed ASR-5 and ASR-6 Wells in the Fitch Park military housing area 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, 2008). Water supply discharges that would occur under the proposed project include all water produced during drilling and development of the subsurface slant wells and ASR-5 and ASR-6 Wells. Under the General Waiver, these discharges would be waived from WDRs and from the requirement of submitting a waste discharge report; however, they would be subject to the following conditions (RWQCB, 2008).

Water Supply Well Drilling Muds:

a) 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.

b) The pH of the discharge shall be between 6.5 and 8.3.

c) The discharge shall not contain oil or grease.

d) 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:

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

b) The discharger shall implement appropriate management practices to preclude discharge to surface waters and surface water drainage courses.

c) 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.

d) The discharge area shall not be located within 100 feet of a stream, body of water, or wetland.

NPDES Municipal Stormwater Permit

The NPDES General Permit for (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 as defined at Title 40 of the Code of Federal Regulations (CFR) Section122.2 (MRSWMP, 2011).

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.[22] The permittees under the small MS4 (Phase II) General Permit[23] 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 (RWQCB, 2013).

The proposed aboveground facilities such as the MPWSP Desalination Plant and Valley Greens Pump Station in unincorporated Monterey County, and the ASR Pump Station, Terminal Reservoir, and ASR injection/extraction well sites in Seaside 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 (City of Monterey, 2011). The Phase II Program contains six Minimum Control Measures (MRSWMP, 2011):

- 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, 2011).

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

[23] 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.

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, 2011).

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 4.3-5** summarizes the new post-construction requirements for different categories of projects, which would include the MPWSP.

TABLE 4.3-5
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.

NPDES Permit for MRWPCA Regional Wastewater Treatment Plant

MRWPCA provides wastewater treatment, disposal, and reclamation services for the cities of Monterey, Pacific Grove, Del Rey Oaks, Sand City, Marina, and Salinas; the Seaside Sanitation District; Castroville, Moss Landing, and Boronda Community Service Districts; and the former Fort Ord military base. Residential, commercial, and industrial wastewater is conveyed to the MRWPCA Regional Wastewater Treatment Plant in Monterey County located 2 miles north of Marina. The MRWPCA Regional Wastewater Treatment Plant has an average dry weather design

treatment capacity of 29.6 million gallons per day (mgd) and peak wet weather design capacity of 75.6 mgd (RWQCB, 2014).

In winter months, secondary treated wastewater from the MRWPCA Regional Wastewater Treatment Plant is discharged to Monterey Bay through a diffuser positioned 11,260 feet offshore at a depth of approximately 100 feet. The diffuser is designed to convey ultimate wet weather flows of 81.2 mgd, which is the permitted rate of discharge through the outfall. The treated wastewater discharge is regulated by the RWQCB (2014) under the *Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant* (Order No. R3-2014-0013, NPDES Permit No. CA0048551). The minimum dilution requirement at the point of discharge is 1:145 (effluent to seawater). The effluent limitations in the permit are consistent with the Basin Plan, Ocean Plan, and Thermal Plan requirements. The permit applies to an area where initial dilution of the discharge is completed and within a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot depth contour, whichever is further from the shoreline. The permit also applies to areas outside this zone designated for water contact recreation use by the Central Coast RWQCB.

In the summer months, up to 29.6 mgd of the secondary treated wastewater from the Regional Wastewater Treatment Plant is conveyed to the Salinas Valley Reclamation Project (SVRP) recycled water plant where it is tertiary treated[24] and subsequently used for irrigation of 12,000 acres of farmland in the northern Salinas Valley. This reclaimed water is distributed to farmland via the Castroville Seawater Intrusion Project (CSIP) distribution system. The SVRP and CSIP reduce the region's dependence on local groundwater, thereby controlling saltwater intrusion. Thus, the varied volumes of wastewater are discharged into the bay through the year in compliance with the water quality limitations in the NPDES Permit.

The NDPES permit incorporates the Ocean Plan water quality objectives established by the SWRCB in order to ensure the protection of the beneficial uses of Monterey Bay. An amendment to this NPDES Permit would be required prior to the implementation of the MPWSP and operation of the MPWSP Desalination Plant. The amendment process for the NPDES Permit (Order No. R3-2014-0013, NPDES Permit No. CA0048551) would require an extensive water quality assessment, which would involve MRWPCA (as the discharger as defined in the current NPDES Permit) and/or CalAm (as a contributor of a new discharge) testing and monitoring the water quality of the discharges, including the testing of the source water drawn from the subsurface water intake wells and piped to the MPWSP Desalination Plant and assessing the resulting water quality of the discharges from the MPWSP Desalination Plant. Any discharge from the operation of the MPWSP Desalination Plant to Monterey Bay through the MRWPCA outfall would be subject to the Amended NPDES Permit.

As per Section 2c of the NPDES Permit, "prior to increasing the volume of brine waste discharged through the ocean outfall beyond 375,000 gallons average daily flow, the Discharger [i.e., MRWPCA] shall submit a brine waste disposal study to the Executive Officer for approval. The study shall include, at a minimum, the following elements: (1) a projection of the brine volume and

[24] Tertiary treatment is an advanced level of treatment provided to secondary treated wastewater prior to use for irrigation under Title 22 regulations.

characteristics, (2) an assessment of the impact of the increased brine volume on permit compliance, (3) an assessment of the impact of the increased brine volume on the minimum probable initial dilution at the point of discharge, (4) a detailed description of the brine waste disposal facilities which are proposed to accommodate the increased brine volume and facilitate blended secondary effluent and brine wastes flow metering and sampling, and (5) a schedule for the design and construction of the new brine disposal facilities."

Section VII B.1 of the NPDES Permit includes the "Reopener Provisions" which states that the [NPDES Permit] Order may be modified in accordance with the requirements set forth at 40 C.F.R. parts 122 and 124, to include appropriate conditions or limits based on newly available information, or to implement any, new State water quality objectives that are approved by the U.S. EPA. As effluent is further characterized through additional monitoring, and if a need for additional effluent limitations becomes apparent after additional effluent characterization, the Order will be reopened to incorporate such limitations."

Further, the NPDES Permit accounts for a potential exceedance of any constituent over the effluent limitation. "An existing effluent limitation for the pollutant shall remain in the permit, otherwise the permit shall include a reopener clause to allow for subsequent modification of the permit to include an effluent limitation if the monitoring establishes that the discharge causes, has the reasonable potential to cause, or contribute to an excursion above a Table 1 water quality objective" (RWQCB, 2014).

In summary, discharge of the brine from the MPWSP Desalination Plant and/or its combination with the existing wastewater discharged through the MRWPCA outfall would be subject to NPDES permit program. As part of the permit amendment process, MRWPCA and CalAm would be required to undergo testing and detailed evaluation of water quality of the discharges along with any measures that may need to be taken in case there were any excursions in the pollutant concentrations.

4.3.2.3 Applicable State, Regional, and Local Land Use Plans and Policies Relevant to Surface Water Hydrology and Water Quality

Table 4.3-6 describes the state, regional, and local land use plans, policies, and regulations pertaining to surface water hydrology and water quality that are relevant to the MPWSP and that were adopted for the purpose of avoiding or mitigating an environmental effect. Also included in **Table 4.3-6** is an analysis of project consistency with such plans, policies, and regulations. Where the analysis concludes the proposed project would not conflict with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes the proposed project may conflict with the applicable plan, policy, or regulation, the reader is referred to Section 4.3.3, Impacts and Mitigation Measures, for additional discussion.

TABLE 4.3-6
APPLICABLE STATE, REGIONAL, AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Goals, Policies, and Programs
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface Slant Wells, Transmission Main, Source Water Pipeline, Desalinated Water Pipeline	***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.	This policy is intended to protect water quality, minimize unnecessary consumption, and provide for future resource needs.	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 Chapter 2, Water Demand, Supplies, and Water Rights for additional information on water use. The issue of groundwater levels is addressed further in Section 4.4, Groundwater Resources. As discussed in Section 4.4, Groundwater Resources, the proposed project would not be expected to 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	Subsurface Slant Wells, Transmission Main, Source Water Pipeline, Desalinated Water Pipeline	***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.	This policy is intended to minimize adverse effects of uncontrolled stormwater runoff.	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 project 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	Subsurface Slant Wells, Transmission Main, Source Water Pipeline, Desalinated Water Pipeline	***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.	This policy is intended to minimize adverse effects of uncontrolled stormwater runoff.	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.

TABLE 4.3-6 (Continued)
APPLICABLE STATE, REGIONAL, AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Goals, Policies, and Programs
City of Marina (coastal zone and inland areas)	Marina Municipal Code	Chapter 15.48 – Flood Damage Prevention	Subsurface Slant Wells, Transmission Main, Source Water Pipeline, Desalinated Water Pipeline	***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.	This section is intended to prevent and reduce damage from floods.	Consistent: Within the city of Marina, portions of the Seawater Intake System and the Source Water Pipeline would be constructed in a 100-year flood hazard area. However, except for the electrical control building and electrical control panel for the Seawater Intake System, the facilities would be placed underground would not 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 Requirement by Type of Subdivision	Subsurface Slant Wells, Transmission Main, Source Water Pipeline, Desalinated Water Pipeline	***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.	This section is intended to control erosion.	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 & inland area)	Marina Municipal Code	Title 8 - Health and Safety	Subsurface Slant Wells, Source Water Pipeline, Desalinated Water Pipeline, Transmission Main	***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.	This section is intended to protect water quality by preventing, controlling, and reducing pollutants (including sediment) from entering stormwater, the storm drain system, and waters of the U.S.	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	Subsurface Slant Wells, Source Water Pipeline, Desalinated Water Pipeline, Transmission Main	***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.	This section is intended to protect water quality by preventing, controlling, and reducing pollutants (including sediment) from entering stormwater, the storm drain system, and waters of the U.S.	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.

TABLE 4.3-6 (Continued)
APPLICABLE STATE, REGIONAL, AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Goals, Policies, and Programs
City of Marina (coastal zone)	Marina Local Coastal Program Land Use Plan	Policy	Subsurface Slant Wells, Source Water Pipeline	**Policy 17.** To insure protection and restoration of ocean's water quality and biological productivity.	This policy is intended to protect ocean 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.
City of Monterey (coastal zone)	California Coastal Act	Marine Environment	Subsurface Slant Wells, MRWPCA Outfall	***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.	This policy is intended to protect the quality and biological productivity of coastal waters.	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 MRWPCA Regional Wastewater 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 4.5, Marine Resources, and 4.6, Terrestrial Biological Resources. As discussed in Sections 4.5, Marine Resources and 4.6, Terrestrial Biological Resources, aquatic biological resource issues would be addressed through implementation of recommended mitigation measures, thereby resolving potential conflicts with applicable biological resources protection policies.
City of Monterey (coastal zone & inland area)	Monterey City Code	Chapter 31.5 - Storm Water Management	Monterey Pipeline	***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.	This section is intended to prevent discharges into the municipal Storm Drain System or waters of the state that could affect water quality.	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 Management	Monterey Pipeline	***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.	This section is intended to prevent pollutants (including sediment) from entering stormwater runoff.	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 zone)	Monterey Harbor Land Use Plan	Natural Marine Resource and Habitat Areas	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); ***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).	This policy is intended to prevent and remove pollutants in water run-off that could degrade soil conditions and water quality.	Consistent: The Monterey Pipeline would be located below ground and 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 construction-related BMPs to prevent stormwater pollutants from leaving the construction sites to protect water quality.

TABLE 4.3-6 (Continued)
APPLICABLE STATE, REGIONAL, AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Goals, Policies, and Programs
City of Monterey (coastal zone)	California Coastal Act	Marine Environment	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.	This policy is intended to protect the quality and biological productivity of coastal waters.	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 MRWPCA Regional Wastewater 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 Sections 4.5, Marine Resources, and 4.6, Terrestrial Biological Resources. As discussed in Sections 4.5, Marine Resources and 4.6, Terrestrial Biological Resources, aquatic biological resource issues would be addressed through implementation of recommended mitigation measures, thereby resolving potential conflicts with applicable biological resources protection policies.
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.	This policy is intended to protect water quality from hazardous materials spills.	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 MPWSP construction or operations.
City of Monterey (coastal zone and inland areas)	Monterey City Code	Chapter 31.5 – Storm Water Management	Monterey Pipeline and Ryan Ranch-Bishop Interconnection Improvements	***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.	This section is intended to protect stormwater quality from pollutants associated with new development.	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 Ryan Ranch-Bishop Interconnection Improvements	***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.	This section is intended to protect people and property from flood hazards.	Consistent: No new habitable development or redevelopment is proposed under the MPWSP 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.

TABLE 4.3-6 (Continued)
APPLICABLE STATE, REGIONAL, AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Goals, Policies, and Programs
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.	This policy is intended to protect marine habitat from any grading, excavation, or construction activity at the shoreline.	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 R3-2008-0010).
City of Monterey (coastal zone)	Del Monte Beach Coastal Land Use Plan	Local Coastal Program, Land Use Plan	Monterey Pipeline	***Policy 15:*** Regional Water Quality Control Board regulations and permit authority, as well as a coastal development permit, shall be required for placement of intake/discharge lines for any future desalinization facilities proposed in the LCP area.	This policy is intended to protect water quality from operation of desalination plants.	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 R3-2008-0010], which requires 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 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.	This policy is intended to protect coastal water quality.	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 R3-2008-0010), 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.	This policy is intended to protect water quality by implementing site design, source control, and treatment control BMPs for all new developments.	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 surfaces.

TABLE 4.3-6 (Continued)
APPLICABLE STATE, REGIONAL, AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Goals, Policies, and Programs
City of Monterey (coastal zone)	Del Monte Beach Coastal Land Use Plan	Local Coastal Program, Land Use Plan	Monterey Pipeline	***Policies Related to Implementation Plan:*** ***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 ***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.	The policies are intended to protect water quality from new development.	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), 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 surfaces.
City of Pacific Grove (inland areas)	Pacific Grove Municipal Code	Chapter 11.97 - Community Floodplain	Monterey Pipeline	***Section 11.97.120 - Standards of construction.*** 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.	This section is intended to protect people and property from flood hazards.	Consistent: No aboveground structures or new habitable developments are proposed under the MPWSP that would lie in a flood-prone area in the city of Pacific Grove.
City of Sand City (coastal zone)	Sand City Municipal Code	Chapter 13.05 –Storm Water Management	Transmission Main, 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.	This guideline is intended to protect and enhance water quality by managing stormwater runoff and discharges.	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 R3-2008-0010]), which require implementation of BMPs and measures to control and minimize stormwater runoff discharges.

TABLE 4.3-6 (Continued)
APPLICABLE STATE, REGIONAL, AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Goals, Policies, and Programs
City of Sand City (coastal zone)	Sand City Local Coastal Land Use Plan	4.Coastal Resource Management	Transmission Main, Transfer Pipeline, Monterey Pipeline	***Section 30231.*** 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.	This section is intended to protect the water quality of the coastal waters and freshwater bodies by controlling wastewater discharges and runoff.	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 R3-2008-0010]), which require implementation of BMPs and measures to control and minimize stormwater runoff and wastewater discharges and protect water quality.
City of Sand City (coastal zone)	Sand City Local Coastal Land Use Plan	4.Coastal Resource Management	Transmission Main, Transfer Pipeline, Monterey Pipeline	***Section 30253.*** New development shall minimize risks to life and property in areas of high geologic, flood, and fire hazard.	This section is intended to protect life and property in areas of high flood 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 under the MPWSP 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	Transmission Main, 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.	This policy is intended to protect coastal and ocean water quality from pollution.	Consistent: The proposed project would be constructed and operated in conformance with the State Construction General Permit and WDRs that require the implementation of specific BMPs and measures to manage stormwater. 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 R3-2008-0010]), 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.	The intent of this policy is to protect public health and property from natural hazards, including fire hazards.	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	Conservation/ Open Space	Transmission Main, Transfer Pipeline, Monterey Pipeline, ASR Pump to Waste Pipeline, ASR Settling Basin, ASR Pump Station, Terminal Reservoir	***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.	This policy is intended to protect surface water quality from pollutants (including sediment) in urban runoff.	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 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 and inland areas)	Seaside General Plan	Conservation/ Open Space	Transmission Main, Transfer Pipeline, Monterey Pipeline, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Settling Basin, ASR Pump Station, Terminal Reservoir	***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.	This policy is intended to protect beneficial uses of creeks, lakes, and adjacent wetlands.	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. Please see

TABLE 4.3-6 (Continued)
APPLICABLE STATE, REGIONAL, AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Goals, Policies, and Programs
						Chapter 2, Water Demand, Supplies, and Water Rights for additional information on water use. The issue of groundwater levels is addressed further in Section 4.4, Groundwater Resources. As discussed in Section 4.4, Groundwater Resources, the proposed project would not be expected to 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. For impacts related to wetlands, please refer to Section 4.6, Terrestrial Biological Resources. As discussed for wetlands in Section 4.6, Terrestrial Biological Resources, for wetlands, the project would have a less than a significant impact with mitigation.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Safety	Transmission Main, Transfer Pipeline, Monterey Pipeline, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Settling Basin, ASR Pump Station, Terminal Reservoir	***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.	This policy is intended to protect people and property from flood hazards.	Consistent: None of the MPWSP components proposed for Seaside would be located in a flood hazard area. With the exception of the Terminal Reservoir and ASR Pump Station, MPWSP components proposed for Seaside would be buried below ground surface and would not present a risk of flood hazard. The Terminal Reservoir and ASR Pump Station are not proposed for 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 Surface management and Discharge Control	Transmission Main, Transfer Pipeline, Monterey Pipeline, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Settling Basin, ASR Pump Station, Terminal Reservoir	***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.	This guideline is intended to manage stormwater quality and control stormwater discharges.	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.
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 8.46 - Health and Safety	Transmission Main, Monterey Pipeline, Transfer Pipeline, ASR Pump to Waste Pipeline, ASR Settling Basin, ASR Pump Station, Terminal Reservoir	***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.	This section is intended to protect surface water quality from pollutants (including sediment) associated with development.	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.

TABLE 4.3-6 (Continued)
APPLICABLE STATE, REGIONAL, AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Goals, Policies, and Programs
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 8.46 - Health and Safety	Transmission Main, Monterey Pipeline, Transfer Pipeline, ASR Pump to Waste Pipeline, ASR Settling Basin, ASR Pump Station, Terminal Reservoir	***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.	This section is intended to protect surface water quality from pollutants (including sediment) associated with development.	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 and 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.	This policy is intended to protect the quality and biological productivity of coastal waters.	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 Section 4.6, Terrestrial Biological Resources. As discussed in Section 4.6, Terrestrial Biological Resources, 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	Conservation	ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Settling Basin, ASR Pump Station, Terminal Reservoir	**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.	This policy is intended to control runoff from new development.	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	Conservation	ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Settling Basin, ASR Pump Station, Terminal Reservoir	**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.	This policy is intended to control runoff from new development.	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.
County of Monterey (inland areas)	Carmel Valley Master Plan	Natural Resources	Valley Greens Pump Station (both site options) and Main System-Hidden Hills Interconnection Improvements	***Policy CV-1.20*** Design ("D") and site control ("S") overlay district designations shall be applied to the Carmel Valley area. Design review for all new development throughout the Valley, including proposals for existing lots of record, utilities, heavy commercial, and visitor accommodations, but excluding minor additions to existing development where those changes are not conspicuous from outside of the property, shall consider the following guidelines: f. Minimize erosion and/or modification of landforms.	This policy is intended to minimize erosion.	Consistent: The proposed project would be constructed and operated in conformance with State Construction General Permit, which requires implementation of BMPs and measures to control and minimize erosion.

TABLE 4.3-6 (Continued)
APPLICABLE STATE, REGIONAL, AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Goals, Policies, and Programs
County of Monterey (inland areas)	Carmel Valley Master Plan	Natural Resources	Valley Greens Pump Station (both site options) and Main System-Hidden Hills Interconnection Improvements	***Policy CV-4.1:*** In order to reduce potential erosion or rapid runoff: a. The amount of land cleared at any one time shall be limited to the area that can be developed during one construction season. b. Motorized vehicles shall be prohibited on the banks or in the bed of the Carmel River, except by permit from the Water Management District or Monterey County. c. Native vegetative cover must be maintained on areas that have the following combination of soils and slope: 1. Santa Lucia shaly clay loam, 30-50% slope (SfF) 2. Santa Lucia-Reliz Association, 30-75% slope (Sg) 3. Cieneba fine gravelly sandy loam, 30-70% slope (CcG) 4. San Andreas fine sandy loam, 30-75% slope (ScG) 5. Sheridan coarse sandy loam, 30-75% slope (SoG) 6. Junipero-Sur complex, 50-85% slope (Jc)	This policy is intended to reduce potential erosion or rapid runoff.	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 reduce erosion and stormwater runoff. The State requirements are incorporated in the municipal stormwater permit.
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 16.08 –Grading	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Valley Greens Pump Station (both site options), Main System-Hidden Hills Interconnection Improvements, Ryan Ranch-Bishop Interconnection Improvements	***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: a. Data regarding the properties, distribution and strength of existing soils b. Recommendations for grading and corrective measures for project design, as appropriate c. An adequate description of the geology of the site and potential hazards. The recommendations from the soil engineering and engineering geology report must be incorporated in the grading plans and construction specifications.	This ordinance is intended to minimize soil erosion, and loss of topsoil, and associated environmental effects.	Consistent: As noted in Chapter 3, Project Description, CalAm would be required to obtain a grading permit prior to project construction. As part of the grading permit review process, CalAm would have to demonstrate conformity with the requirements of the Monterey County Grading Ordinance, including specific provisions designed to minimize soil erosion, loss of topsoil, and associated environmental effects. In addition, the proposed project would be subject to the State Construction General Permit and the Monterey County Erosion Control Ordinance, which also require the implementation of specific construction-related BMPs to minimize erosion and soil loss, and prevent stormwater pollutants from leaving the construction sites.

TABLE 4.3-6 (Continued)
APPLICABLE STATE, REGIONAL, AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Goals, Policies, and Programs
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 16.12 -Erosion Control	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Valley Greens Pump Station (both site options), Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***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.	This ordinance is intended to minimize erosion and soil loss, and associated water quality impacts, among other environmental effects.	Consistent: As noted in Chapter 3, Project Description, CalAm would be required to obtain a grading permit prior to project construction. As part of the grading permit review process, CalAm would have to demonstrate conformity with the requirements of the Monterey County Erosion Control Ordinance, including through preparation of an erosion control plan indicating proposed methods for the control of runoff, erosion, and sediment movement. In addition, the proposed project would be subject to the State Construction General Permit, which also 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 - Development of Floodplains	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Valley Greens Pump Station (both site options), Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***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).	This ordinance is intended to protect people, property, and the environment from the effects of development in flood hazard areas.	Consistent: None of the aboveground MPWSP components proposed for unincorporated Monterey County would be located in a floodplain.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Valley Greens Pump Station (both site options), Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***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.	This policy is intended to protect people, property, and the environment from the effects of development in geologic and hydrologic hazard 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 and NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2008-0010]), which require implementation of BMPs and measures to control and reduce erosion and pollutant discharge, thus both stormwater runoff and quality. 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	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Valley Greens Pump Station (both site options), Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***Policy OS-4.2:*** Direct and indirect discharges of harmful substances into marine waters, rivers or streams shall not exceed state or federal standards.	This policy is intended to protect the quality of marine waters, rivers, and streams.	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 R3-2008-0010], 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 amendment to the NPDES permit for discharging brine from the MPWSP Desalination Plant into Bay through the existing MRWPCA outfall.

TABLE 4.3-6 (Continued)
APPLICABLE STATE, REGIONAL, AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Goals, Policies, and Programs
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Valley Greens Pump Station (both site options), Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***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.	This policy is intended to protect and maintain the quality of coastal waterways and designated ASBSs.	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 R3-2008-0010], 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 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 amendment to the NPDES permit for discharging brine from the MPWSP Desalination Plant into Bay through the existing MRWPCA outfall.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Valley Greens Pump Station (both site options), Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***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.	This policy is intended to protect people and property from flood hazards.	Consistent: No aboveground facilities or developments are proposed under the MPWSP that would be located in 100-year floodplain areas.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Valley Greens Pump Station (both site options), Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***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.	This policy is intended to protect people and property from flood hazards.	Consistent: No aboveground facilities or developments are proposed under the MPWSP that would be located in 100-year floodplain areas.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Valley Greens Pump Station (both site options), Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***Policy S-2.8:*** Alternative project designs and densities to minimize development in the floodplain shall be considered and evaluated.	This policy is intended to protect people and property from flood hazards.	Consistent: No aboveground facilities or developments are proposed under the MPWSP that would be located in 100-year floodplain areas.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Valley Greens Pump Station (both site options), Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***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 Monterey County Water Resources Agency.	This policy is intended avoid potential adverse effects of increased surface runoff from new development.	Consistent: Within the county of Monterey, 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 R3-2008-0010], 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.

TABLE 4.3-6 (Continued)
APPLICABLE STATE, REGIONAL, AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Goals, Policies, and Programs
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Valley Greens Pump Station (both site options), Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***Policy S-3.2:*** Best Management Practices to protect groundwater and surface water quality shall be incorporated into all development.	This policy is intended to protect groundwater and surface water quality from pollutants associated with 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 Section 4.4, Groundwater Resources. As discussed in Section 4.4, Groundwater Resources, groundwater quality issues would be addressed through implementation of recommended mitigation measures, thereby resolving potential conflicts with applicable groundwater quality protection policies.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Valley Greens Pump Station (both site options), Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***Policy S-3.3:*** Drainage facilities to mitigate the post-development peak flow impact of new development shall be installed concurrent with new development	This policy is intended avoid potential adverse effects of increased surface runoff from new development.	Consistent: Within the county of Monterey, the proposed project would be subject to State WDRs set forth in the local 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.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Valley Greens Pump Station (both site options), Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***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 Monterey County Water Resources Agency.	This policy is intended to protect groundwater and surface water quality from pollutants associated with development.	Consistent: Within the county of Monterey, the proposed project would be subject to State WDRs set forth in the local 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.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Valley Greens Pump Station (both site options), Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***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.	This policy is intended to protect surface water quality from pollutants that may be present in stormwater runoff.	Consistent: The proposed project would be subject to State WDRs set forth in the local municipal stormwater permit, which require implementation of 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 flow drainage from the site must match pre-project flows.
County of Monterey (coastal zone)	North County Land Use Plan	Land Use and Development	Source Water Pipeline, Desalinated Water Pipeline	***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.	This policy is intended to provide long-term management and protection of the County's coastal resources.	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 4.15, Cultural Resources, 4.16, Agriculture and Forestry Resources, and 4.6, Terrestrial Biological Resources, respectively, which present additional discussion of the project's conformity with applicable North County Land Use Plan policies governing these resource areas, respectively.
County of Monterey	Fort Ord Reuse Authority Base Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	**Hydrology and Water Quality Policy A-1:** At the project approval stage, the County shall require new development to demonstrate that all measures will be taken to ensure that	The intent of this policy is for new development to demonstrate implementation of measures to minimize	Consistent: There would be no aboveground improvements that would constitute new development and increase in runoff. The proposed pipelines as part

TABLE 4.3-6 (Continued)
APPLICABLE STATE, REGIONAL, AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Goals, Policies, and Programs
				runoff is minimized and infiltration maximized in groundwater recharge areas.	and allow infiltration of the runoff.	of the interconnections would be located underground and the surface along the pipeline alignments would be restored to pre-construction conditions.
County of Monterey	Fort Ord Reuse Authority Base Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	**Hydrology and Water Quality Policy C-2:** At the project approval stage, the County 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.	The intent of this policy is for new development to demonstrate that onsite drainage systems are implemented such that they capture and filter out urban runoff.	Consistent: There would be no aboveground improvements that would constitute new development and increase in runoff. The proposed pipelines as part of the interconnections would be located underground and the surface along the pipeline alignments would be restored to pre-construction conditions.

SOURCE: City of Marina, 2006; City of Monterey 2003; City of Sand City, 1982; City of Seaside, 2004b, 2012; FORA, 1997; Monterey County 1982, 2010a, 2010b.

4.3.3 Impacts and Mitigation Measures

4.3.3.1 Significance Criteria

Appendix G of the CEQA Guidelines recommends the following significance criteria for the evaluation of surface water hydrology and water quality impacts. This EIR assumes implementation of the proposed project would have a significant impact on surface water hydrology and water quality if it would:

- Violate any water quality standards or waste discharge requirements;
- 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;
- 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 increasing the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- 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;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- 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
- Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche,[25] tsunami, or mudflow.

In addition to the above-listed significance criteria from the CEQA Guidelines, the following significance criteria have been developed to capture the full range of project effects and are also used to assess project impacts in Sections 4.3.3.4 and 4.3.3.5, below. The criteria take into account the current water quality conditions and the water quality objectives shown in **Tables 4.3-3** and **4.3-4** above. Implementation of the proposed project would have a significant impact related to surface water hydrology and water quality if it would:

- Exceed the water quality objectives established in the Ocean Plan;
- Exceed a daily maximum of 2.0 ppt above natural background salinity at the edge of the mixing zone[26]; or

[25] A seiche is a rhythmic motion of water in a partially or completely landlocked water body caused by earthquakes, landslides, tsunamis, or local changes in atmospheric pressure.

[26] Mixing zone or the zone of initial dilution is defined as the zone immediately adjacent to a discharge where buoyancy-driven and momentum mixing produces rapid dilution of the discharge.

- Expose people or structures to a significant risk of loss, injury, or death involving coastal flooding from sea level rise.

Based on the nature of the proposed project, there would be no impacts related to the following significance criteria for the reasons described below:

Place Housing within a 100-Year Flood Hazard Zone. The proposed project would not involve construction of new housing or structures for human occupancy within a 100-year flood hazard zone. 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.

Expose People or Structures to Inundation by Seiche or Mudflow. 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 such as the Del Monte Lake, Laguna del Rey, or El Estero Lake in the project area) because the proposed project would not create new enclosed water bodies or affect the frequency of earthquakes. Further, as the proposed project would not include the construction of habitable structures, there would be no impacts related to property loss, injury, or death from a seiche. Due to the relatively flat topography of the project area, project implementation would not expose people or property to increased mudflow hazards. Therefore, no impact related to inundation by seiche or mudflow would result.

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. There are no dams or levees immediately adjacent to the project area. Dams that are located in the region include Los Padres and San Clemente Dams on the Carmel River and Nacimiento and San Antonio Dams on the Salinas River. None of the proposed facilities would lie within the predicted dam inundation zone. Implementation of the proposed project would not affect reservoir operations. Therefore, the proposed project would not expose people or structures to flooding damages due to failure of a dam or levee. There would be no impact associated with potential flooding from levee or dam failure. Relevant flooding-related issues are addressed under Impacts 4.3-8 through 4.3-10 in Section 4.3.3.5, below.

4.3.3.2 Approach to Analysis

This analysis evaluates the proposed project's potential effects on surface water hydrology and water quality during project construction and operations. Construction-related effects on surface water hydrology and water quality relate to direct and indirect impacts that could occur during construction activities, including site preparation and clearing, excavation, dewatering, and demobilization and site restoration. Operational impacts involve long-term effects related to facility siting, operational discharges, and maintenance activities. The impact analysis is organized by construction impacts and operational impacts.

The discussion of construction impacts presented in Section 4.3.3.3, below, is based on conservative assumptions regarding project construction activities, existing site conditions, and the applicable water quality objectives established by the Construction General Permit and the local ordinances.

The discussion of operational impacts presented in Section 4.3.3.4 is based on operational discharges and any potential post-construction or long-term effects from building the new facilities (such as increases in storm runoff from addition of impervious surfaces).

The impact analysis describes if and to what degree the MPWSP would change the existing hydrology, water quality, and flooding conditions described in Section 4.3.1 and how the MPWSP would comply with or exceed any regulatory requirements described in Section 4.3.2. The severity of an impact is determined using the significance criteria identified in Section 4.3.3.1. Impacts to water quality associated with the brine discharge are evaluated against both the current and proposed[27] Ocean Plan water quality objectives in an attempt to ensure consistency with future water quality standards at the time of EIR certification and project approval.

4.3.3.3 Summary of Impacts

Table 4.3-7 summarizes the proposed project's impacts and significance determinations related to surface water hydrology and water quality.

TABLE 4.3-7
SUMMARY OF IMPACTS – SURFACE WATER HYDROLOGY AND WATER QUALITY

Impacts	Significance Determinations
Impact 4.3-1: Degradation of water quality associated with increased soil erosion and inadvertent releases of toxic chemicals during general construction activities.	LS
Impact 4.3-2: Degradation of water quality from construction-related discharges of dewatering effluent from open excavations and water produced during well drilling and development.	LSM
Impact 4.3-3: Degradation of water quality from discharges of treated water and disinfectant from existing and newly installed pipelines during construction.	LS
Impact 4.3-4: Violate water quality standards or waste discharge requirements or degrade water quality as a result of brine discharge from the operation of the MPWSP Desalination Plant.	LSM
Impact 4.3-5: Violate water quality standards or waste discharge requirements or degrade water quality from increased salinity as a result of brine discharge from the operation of the MPWSP Desalination Plant.	LS
Impact 4.3-6: Degradation of water quality due to discharges associated with maintenance of the subsurface slant wells and the ASR injection/extraction wells.	LS
Impact 4.3-7: Alteration of drainage patterns such that there is a resultant increase in erosion, siltation, or the rate or amount of surface runoff.	LS
Impact 4.3-8: Alteration of drainage patterns such that there is an increase in flooding on- or offsite or the capacity of the stormwater drainage system is exceeded.	LS
Impact 4.3-9: Impedance or redirection of flood flows due to the siting of project facilities in a 100-year flood hazard area.	LS
Impact 4.3-10: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to a tsunami.	LS
Impact 4.3-11: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise.	LS

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

[27] Not yet adopted by the SWRCB.

4.3.3.4 Construction Impacts and Mitigation Measures

Impact 4.3-1: Degradation of water quality associated with increased soil erosion and inadvertent releases of toxic chemicals during general construction activities. (*Less than Significant*)

General Construction Activities (Applies to All Project Components)

Project construction activities would involve site clearing and earthmoving activities, excavation and soil stockpiling, and temporary storage and use of chemicals such as fuel. Earthmoving activities associated with project construction would include vegetation removal, grading, excavation, soil stockpiling, and backfilling. Prior to construction mobilization, the contractor(s) would prepare construction work areas and staging areas by removing vegetation and debris, and grading these areas to provide a relatively level surface for the movement of construction equipment.

Soil disturbing activities could result in soil erosion and the migration of soil and sediment in stormwater runoff to downgradient water bodies and storm drains. Sediment from project-related construction activities could degrade the water quality of receiving water bodies such as the Salinas River and Monterey Bay.

As part of project construction, workers would install over 30 miles of pipelines. Most pipeline segments would be installed using conventional open-trench construction methods. Open excavations would also be required for construction of buildings and aboveground structures, including the MPWSP Desalination Plant, ASR Pump Station, ASR-5 and ASR-6 Wells, Valley Greens Pump Station, and Terminal Reservoir. Grading and earthwork would be required for foundations, parking areas, and access road improvements. The combination of all project construction activities would generate an estimated 35,225 cubic yards of excess spoils and construction debris. If not properly managed, stockpiled spoils could be transported offsite during precipitation events and could result in increased sedimentation in downstream receiving waters bodies.

Construction activities could also result in the accidental release of hazardous construction chemicals such as adhesives, solvents, fuels, and petroleum lubricants that, if not managed appropriately, could adhere to soil particles, become mobilized by rain or runoff, and degrade water quality.

Project construction activities would disturb more than one acre of soil, and therefore would be subject to the NPDES Construction General Permit requirements. As required under the Construction General Permit a 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 drilling and related construction activities, would be implemented throughout the duration of construction activities. As discussed in Section 4.3.2, Regulatory Framework, above, 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 water quality during general construction activities.

In addition to the NPDES Construction General Permit requirements, construction contractor(s) would be required to comply with the local City municipal codes and the County code, depending on the construction activities and the pertinent jurisdictions. For example, construction of the subsurface slant wells in the CEMEX active mining area and approximately 0.25 mile (1,320 feet) of the Source Water Pipeline would be subject to the City of Marina Municipal Code, which requires the installation of erosion control measures such as sediment fencing and adequate set back from the shoreline to withstand erosion to the extent that the reasonable economic life of the use

would be guaranteed without need for shoreline protection structures. (Refer to Section 4.2, Geology, Soils, and Seismicity, for a discussion of effects associated with coastal erosion.) Mandatory compliance with the water quality protection requirements of the Construction General Permit and the accompanying regulatory process would ensure that the necessary controls to minimize soil erosion, manage runoff, and protect water quality are in place during general construction activities. Therefore, the water quality impact associated with general construction activities would be less than significant.

Impact Conclusion

For all project facilities, mandatory compliance with NPDES Construction General Permit requirements would involve implementation of erosion and stormwater control measures, which would prevent substantial adverse effects on water quality during construction. The impact to water quality associated with increased soil erosion and sedimentation, and inadvertent releases of toxic chemicals during general construction activities would be less than significant for all project components. No mitigation is necessary.

Mitigation Measures

None required.

Impact 4.3-2: Degradation of water quality from construction-related discharges of dewatering effluent from open excavations and water produced during well drilling and development. (*Less than Significant with Mitigation*)

Discharges of Water Produced during Well Drilling and Development (Subsurface Slant Wells and ASR-5 and ASR-6 Wells)

Construction activities associated with the subsurface slant wells and ASR-5 and ASR-6 Wells would involve: drilling the borehole (well drilling); constructing the well inside the borehole by installing the well casing and well screens and filling the annulus around the casing with a gravel (filter) pack and cement seal (well construction); and then surging water in and out of the well screen openings to clean the borehole and properly settle the gravel pack (well development).

Subsurface Slant Wells. Drilling of the subsurface slant wells would involve the extraction of water, which may contain soil cuttings and formation water (water present at depth in geologic materials). No chemicals or binders would be used during the drilling process. The muds generated during the drilling and development of the subsurface slant wells would fall under the category of "Water Supply Well Drilling Muds" in the General Waiver. The muds would be routed to portable holding tanks to allow sediment to settle out, and then the water would be percolated into the ground in the CEMEX active mining area. The water produced during slant well drilling and development would be considered a "water supply discharge" under the General Waiver of WDRs for Specific Types of Discharges (General Waiver) (RWQCB Resolution R3-2008-0010), discussed above in Section 4.3.2, Regulatory Framework. CalAm would not be required to submit a waste discharge report. However, the following conditions of the General Waiver would apply:

- 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, water body, wetland, or streamside riparian corridor;
- 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; and
- The discharger shall immediately notify the Central Coast RWQCB staff of any discharge to surface waters or surface water drainages. The discharge shall not have chlorine or bromine concentrations that could impact groundwater quality.

Because the disposal of water produced during well drilling and development activities would comply with the conditions of the General Waiver, the impact would be less than significant and no mitigation is necessary.

ASR Injection/Extraction Wells (ASR-5 and ASR-6 Wells). As described in Section 3.5.7 of Chapter 3, Project Description, the ASR injection/extraction wells would be drilled without the use of drilling muds containing bentonite clays. However 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 are commonly used by the well drilling industry 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 ASR-5 and ASR-6 Wells in the Fitch Park military housing area would fall under the category of "Water Supply Well Drilling Muds" in the General Waiver. Water extracted during drilling and development of the ASR-5 and ASR-6 Wells would be placed in portable holding tanks to settle out solids, conveyed to a 1.4-acre natural depression located east of the intersection between San Pablo Avenue and General Jim Moore Boulevard, and subsequently percolated into the ground. This depression was previously used to percolate water produced during the development of the existing ASR-3 and ASR-4 Wells (Phase II wells). Similar to the subsurface slant wells, it is anticipated that discharges of water produced during the drilling and development of the ASR-5 and ASR-6 Wells would be conducted in accordance with the General Waiver. Thus, the same

conditions of the General Waiver described above for the slant wells would also apply to the ASR-5 and ASR-6 Wells.

Adherence to the conditions of the General Waiver would prevent significant adverse effects on water quality from discharges of water produced during drilling and development of the ASR-5 and ASR-6 Wells. The impact would be less than significant.

Dewatering Discharges (All Other Project Facilities)

Dewatering could be required during construction to create a dry work area if surface water or groundwater is encountered in excavations. Project construction activities, particularly open-cut trenching, jack-and-bore, and microtunneling for the installation of pipelines, could intercept shallow or perched groundwater and require temporary localized dewatering to facilitate construction.

Most of the dewatering effluent produced during construction and excavation is considered a low threat and could be discharged to land or the stormwater drainage system provided it complies with the *General WDRs for Discharges with a Low Threat to Water Quality* (Order No. R3-2011-0223, NPDES Permit No. CAG993001) (RWQCB, 2011a). 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 WDRs, CalAm would submit a NOI along with the following materials to the Central Coast RWQCB (2011a):

- 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 WDRs. 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, CalAm would provide analytical data for discharges from similar existing facilities, or information regarding the anticipated discharge characteristics of the proposed facility based on the specific facility design. As part of facility startup, CalAm would submit all analytical results required in Section A of the General WDRs; 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 WDRs, CalAm may submit a Reasonable Potential Analysis[28] consistent with Section 1.3 of the State Implementation Policy or Appendix VI of the Ocean Plan, as applicable.

[28] A Reasonable Potential Analysis is the process for determining whether any of the constituents in a discharge causes, has reasonable potential to cause, or contributes to an exceedance of a water quality standard.

As discussed in Section 4.3.2, Regulatory Framework, and in the bulleted list above, CalAm would be required to test the dewatering effluent for possible pollutants. The analytical constituents for such tests are generally based on the source of the water, the land use history of the construction site, and potential impacts to the quality of the receiving water. If the dewatering effluent meets the water quality requirements of the General WDRs, CalAm's construction contractor(s) would discharge the dewatering effluent to vegetated upland areas or the local storm drain system in accordance with the General WDRs. It is assumed most dewatering effluent would be disposed of in accordance with the General WDRs.

In certain cases, depending on the site-specific conditions and the construction methods, suspended sediment and/or trace amounts of construction-related chemicals (e.g., 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, including hazardous materials from previous spills or leaks. Discharges of contaminated dewatering effluent to vegetated upland areas or the local storm drain system would result in a significant impact. However, the impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.7-2b (Soil and Groundwater Management Plan)**, which requires construction contractors to comply with all relevant environmental regulations and plan for the safe and lawful disposal of contaminated groundwater, when encountered.

Impact Conclusion

The water extracted during drilling and development of the subsurface slant wells and ASR-5 and ASR-6 Wells would be disposed of in accordance with the General Waiver (RWQCB Resolution R3-2008-0010). All discharges of water produced during well drilling and development would occur in compliance with regulatory requirements that are protective of the receiving waters. Therefore, the impact associated with discharges of water produced during drilling and development of the subsurface slant wells and ASR-5 and ASR-6 Wells would be less than significant.

With respect to general construction dewatering, it is anticipated that most dewatering effluent would be disposed of in accordance with the General WDRs (Central Coast RWQCB Order R3-2011-0223). However, discharges of dewatering effluent exceeding the water quality limitations in the General WDRs would result in a significant impact. This impact would be reduced to a less-than-significant level with implementation of the **Mitigation Measure 4.7-2b**. Thus, for all project facilities except the subsurface slant wells and ASR-5 and ASR-6 Wells, the impact associated with discharges of dewatering effluent would be less than significant with implementation of mitigation.

Mitigation Measures

Mitigation Measure 4.7-2b applies to all project components except the subsurface slant wells and the ASR-5 and ASR-6 Wells.

Mitigation Measure 4.7-2b: Soil and Groundwater Management Plan.

(See Section 4.7, Hazards and Hazardous Materials, for the description.)

Impact 4.3-3: Degradation of water quality from discharges of treated water and disinfectant from existing and newly installed pipelines during construction. (*Less than Significant)*

Source Water Pipeline, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Transmission Main, Monterey Pipeline, Transfer Pipeline, ASR Conveyance Pipelines, ASR Pump-to-Waste Pipeline, and the pipelines associated with the Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements

Prior to constructing the connections between existing and new pipelines, segments of existing pipelines would need to be drained and later disinfected prior to being returned to service. Newly installed pipelines (i.e., the Source Water Pipeline, Desalinated Water Pipeline, Salinas Valley Return Pipeline, Brine Discharge Pipeline, Transmission Main, Monterey Pipeline, Transfer Pipeline, ASR Conveyance Pipelines, ASR Pump-to-Waste Pipeline, and the pipelines associated with the Ryan Ranch-Bishop Interconnection Improvements and Main System-Hidden Hills Interconnection Improvements) would also be disinfected before being put into service. It is anticipated that chlorine would be used for disinfection. The treated water generated from the draining of existing pipelines and the effluent generated from disinfection of newly installed pipelines would be discharged to the local storm drainage system. Without proper controls, these discharges could adversely affect water quality in downstream receiving water bodies by increasing turbidity (if discharged directly without appropriate treatment) or due to high chlorine (the primary disinfectant used for drinking water) concentrations. However, the discharges would be subject to the *General WDRs for Discharges with Low Threat to Water Quality* (Order No. R3-2011-0223, NPDES Permit No. CAG993001). The General WDRs require that CalAm neutralize the residual chlorine remaining in disinfection effluent such that detectable chlorine levels are less than 0.02 mg/L, and require that the total dissolved solids be within surface water and groundwater quality objectives (RWQCB, 2011a). Compliance with the General WDRs and the conditions therein would protect water quality in receiving water bodies. Therefore, the impact would be less than significant.

All Other Proposed Facilities

None of the other proposed facilities are anticipated to require flushing and generate disinfection effluent prior to being brought online. Thus, no impact would result.

Impact Conclusion

Adherence to the General WDRs (Order No. R3-2011-0223, NPDES Permit No. CAG993001) would ensure this impact is less than significant for the Source Water Pipeline, Salinas Valley Return Pipeline, Brine Discharge Pipeline, Desalinated Water Pipeline, Transmission Main, Monterey Pipeline, Transfer Pipeline, ASR Conveyance Pipelines, ASR Pump-to-Waste Pipeline, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills

Interconnection Improvements. Construction of all other proposed project facilities would have no impact to water quality associated with discharges of treated water or disinfection effluent.

Mitigation Measures

None required.

4.3.3.5 Operational Impacts and Mitigation Measures

Impact 4.3-4: Violate water quality standards or waste discharge requirements, or degrade water quality as a result of brine discharge from the operation of the MPWSP Desalination Plant. (*Less than Significant with Mitigation*)

Summary – Ocean Plan Water Quality Constituents

This impact discussion assesses the potential operational water quality impacts from point discharges related to the MPWSP, i.e., the discharge of brine generated at the proposed MPWSP Desalination Plant into Monterey Bay through the existing MRWPCA outfall. Treated wastewater from the existing MRWPCA Regional Wastewater Treatment Plant is currently discharged through the MRWPCA outfall. Depending upon the time of the year and the wastewater flows released, the operation of the MPWSP Desalination Plant would result in a brine-only discharge or a combined discharge (brine blended with treated wastewater). The current NPDES Permit (Order No. R3-2014-0013, NPDES Permit No. CA0048551), which regulates the wastewater discharge from the outfall, would be amended before the MPWSP Desalination Plant comes into operation to incorporate the brine-only and combined discharges. Under the Amended NPDES Permit, the discharges would be subject to the Ocean Plan water quality objectives, which would be incorporated into the permit in the form of specific effluent limitations as water quality requirements. The Ocean Plan water quality objectives, therefore were used as significance thresholds to determine the impact significance.

The operational water quality impacts were analyzed by studying whether the brine-only and the combined discharges would exceed the Ocean Plan water quality objectives. The analysis relies upon best available information and uses multiple available data sets for the source water entering the MPWSP Desalination Plant and two comparative methodologies to assess the water quality of the discharges in order to most conservatively assess a representative range of potential impacts. As shown in detail in **Appendices D3** and **D4**, the data analyses demonstrate that using the Monterey Bay water quality data for source water, the brine-only and the combined discharges (with low wastewater flow) would result in a potential exceedance in PCBs over the Ocean Plan water quality objectives. The combined discharge with moderate wastewater flow would result in an exceedance in PCBs as well as ammonia. This would be a significant impact, which would be minimized to a less-than-significant level by implementing **Mitigation Measure 4.3-4 (Implement Protocols to Avoid Exceeding Water Quality Objectives at the Edge of the ZID)**.

As discussed in Section 4.3.1, Setting and **Table 4.3-4**, the ambient PCB level or concentration in Monterey Bay[29] currently exceeds the water quality objective for PCBs set forth in the Ocean Plan. Since water quality data for Monterey Bay was used in the analysis for quality of the source water entering the MPWSP Desalination Plant, and because Monterey Bay water (the source water) data shows an exceedance over the water quality objective for PCBs, concentrating the constituents present in the source water through the desalination process through the generation of brine was found to result in an exceedance over the Ocean Plan water quality objectives for PCBs upon its discharge. However, it is very likely that a fraction of the PCBs in Monterey Bay water are associated with suspended solids or colloids in the aqueous (or the water or liquid) phase. It is reasonable to assume that PCBs associated with colloids or suspended solids will be removed by passage of the seawater through sediment en route to the subsurface intake wells (Luthy, 2015). This analysis however, took a conservative approach and concluded that the impact due to the exceedance in PCBs could be significant and would need mitigation.

The combined discharge with moderate wastewater flow showed an exceedance for ammonia due to lower dilution and a relatively higher concentration of ammonia in higher wastewater flows. This would be a significant impact, which would be minimized by implementing mitigation. **Mitigation Measure 4.3-4 (Implement Protocols to Avoid Exceeding Water Quality Objectives at the Edge of the ZID)** would involve utilizing design features and/or executing operational measures such as achieving a higher dilution through temporarily storing the brine at the MPWSP Desalination Plant site and releasing it in batches at an increased flow rate (which would increase the rate of mixing and dilution with ocean waters) or using treatment methods for the source water and/or brine, if deemed necessary or by releasing the brine along with the wastewater when adequate wastewater flows (greater than ~20 mgd) are available in the case of the combined discharge.

As stated above, the brine and combined discharges would be incorporated into the amended NPDES Permit and subject to the permit requirements. The amendment process will result in revised permit conditions to include such measures and mandatory compliance with the permit. The discharges would be subject to any requirements proposed by the RWQCB as part of the permit amendment process, to ensure that operation of the Desalination Plant would not violate waste discharge requirements defined in the amended NPDES permit upon discharge of the brine. Implementation of **Mitigation Measure 4.3-4 (Implement Protocols to Avoid Exceeding Water Quality Objectives at the Edge of the ZID)** will ensure compliance with the regulatory standards that would protect the beneficial uses and would result in a less-than-significant impact.

MPWSP Desalination Plant Operation and Discharge Scenarios

The MPWSP Desalination Plant would treat the source water at a 42 percent recovery rate to produce 9.5 mgd of desalinated product water. Approximately 14 mgd of brine would be generated, consisting of concentrates from the pretreatment and reverse osmosis (RO) processes as well as waste effluent produced during routine backwashing and operation and maintenance of the

[29] Both average and maximum levels of PCBs based on the data collected under CCLEAN (discussed in Section 4.3.1, Setting, above)

pretreatment filters. The brine generated in the desalination process would be discharged into Monterey Bay through the MRWPCA's existing ocean outfall (see **Figures 3-3** and **3-4** in Chapter 3, Project Description). The outfall consists of an 11,260-foot-long pipeline with a diffuser positioned offshore in Monterey Bay at a depth of approximately 100 feet (RWQCB, 2014). The diffuser has 120 operational ports (See Section 3.4.2.5 in Chapter 3, Project Description, for additional information).

During certain times of the year, the brine would blend with treated wastewater (when available) from the MRWPCA Regional Wastewater Treatment Plant, forming a combined discharge. **Table 4.3-8** shows the monthly projected brine flows from the MPWSP Desalination Plant and the average monthly wastewater flows from MRWPCA.

TABLE 4.3-8
MONTHLY AVERAGE FLOWS OF SECONDARY-TREATED WASTEWATER FROM THE MRWPCA REGIONAL WASTEWATER TREATMENT PLANT (MGD) (1998–2012) AND OF THE ESTIMATED BRINE STREAM UNDER THE MPWSP

Months	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Brine-Only	*13.98*	13.98	13.98	13.98	13.98	13.98	*13.98*	13.98	*13.98*	13.98	13.98	13.98
Treated Wastewater from MRWPCA	*19.78*	18.41	14.68	7.02	2.40	1.89	0.90	1.03	2.79	9.89	17.98	19.27
Combined Discharge (Brine+wastewater)	*33.76*	32.39	28.66	21.00	16.38	15.87	14.88	15.01	16.77	23.87	31.96	33.25

NOTE: Shaded cells represent the seasonal discharge scenarios used in the analysis of operational water quality impacts.

Numbers in *italics* represent the flow rates used in the modeling analysis of salinity (discussed in Impact 4.3-5), the results of which were used to analyze other constituents in the brine and combined discharges (discussed below in this impact analysis). In the case of the combined discharge, the modeling analysis also used low wastewater flow rates of 0.25, 0.5, 1, and 2 mgd and a moderate flow of 9 mgd.

SOURCES: MRWPCA, 2013; Trussell Technologies, 2015 in **Appendix D4.**

As shown in **Table 4.3-8**, the treated wastewater flow varies throughout the year, with the highest flows observed during the non-irrigation season (November through March) and the lowest flows observed during the irrigation season (April through October), when the treated wastewater is processed through the SVRP for tertiary treatment and distributed to irrigators through the CSIP. During the irrigation season, on some days, all of the wastewater flows could be provided to irrigators, and only the project brine would be discharged into Monterey Bay through the outfall. This analysis assumes that the brine would be discharged without dilution during the entire irrigation season (dry months), and that the combined discharge (i.e., the brine blended with treated wastewater) would be released during the non-irrigation season (wet months) only. Using this conservative assumption, the impact analysis focuses on the brine-only discharge that would occur during the entire irrigation season (shaded cells in **Table 4.3-8**) and the combined discharge that would occur during non-irrigation season. For the combined discharge scenario, the data analysis accounted for different wastewater flows ranging from 19.78 mgd in the winter/Davidson season (when higher discharge flows are anticipated) to a range of lower flows

of 0.25, 0.5, 1, and 2 mgd (**Table 4.3-8**) assuming 120 ports open at the diffuser of the MRWPCA outfall.

The combined discharge during the non-irrigation season would be consistent with the recommendations in the SWRCB's technical report on discharges of brine from desalination plants[30] and with the proposed amendments to the Ocean Plan (SWRCB, 2014; 2015) by "co-discharging it with municipal wastewater" and discharging it "through a multiple-port diffuser system" (SWRCB, 2012a). The proposed brine-only discharge during the irrigation season and as well as the combined discharge would also adhere to the panel's recommendation of discharging it through a multiple-port diffuser system.

Approach to Analysis – Ocean Plan Water Quality Constituents

The approach to analyzing potential impacts to water quality is focused on studying whether the brine-only and combined discharges would exceed the water quality objectives established in the Ocean Plan, which are protective of the beneficial uses identified for Monterey Bay. Noncompliance with the water quality objectives could degrade water quality and adversely affect the beneficial uses of the receiving waters in the bay.

As discussed in detail in Section 4.3.2, Regulatory Framework, the Ocean Plan establishes objectives for a wide range of constituents and also forms the basis of effluent quality requirements for waste discharges. For typical wastewater discharges, when released from an outfall, the wastewater and ocean water undergo rapid mixing (see Flow Science, Inc., 2014 in **Appendix D2** for details). The mixing of the discharge with receiving ocean waters is affected by the buoyancy and momentum of the discharge, a process referred to as initial dilution. The Ocean Plan water quality 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 ZID. The ZID is defined as the zone immediately adjacent to a discharge where buoyancy- and momentum-driven mixing produces rapid dilution of the discharge. Therefore, compliance with Ocean Plan objectives at the outer edge of the ZID was used as the threshold for determining water quality impacts. **Table 4.3-3** in Section 4.3.2, Regulatory Framework provides the suite of constituents and their Ocean Plan water quality objectives. The water quality impact was analyzed based on available data for this list of constituents.

Based on published literature on discharges from desalination plants, temperature is a commonly studied parameter, particularly when brine streams from desalination plants combined with power (thermal) plant discharges that have high temperatures (Roberts et al., 2010; Dawoud and Al Mulla, 2012) as well as the anticipated increase in temperature from the distillation and other processes that use high temperatures (Dawoud and Al Mulla, 2012). In this case, the MPWSP Desalination Plant would be an independent facility and would not operate in combination with a thermal or power plant. There would be no heating mechanism or any process that would increase the temperature of the source water as it passes through the treatment units. Therefore, the

[30] The recommendations were made as part of the Southern California Coastal Water Research Project, discussed in Section 4.3.2, Regulatory Framework.

desalination process under the MPWSP is not expected to substantially increase the temperature of the discharged effluent and is not discussed further.

Methodology – Ocean Plan Water Quality Constituents

The impact analysis relies upon best available information. Different available data sets for the source water entering the MPWSP Desalination Plant and different methodologies to assess the water quality of the discharges were used in order to conservatively characterize the likely range of potential impacts. The specific constituent concentrations resulting from the discharges vary with the resolution of the data and the methodology used in **Appendix D3** and **D4**. **Appendix D3** contains the water quality analysis developed for the MPWSP and **Appendix D4** contains the analysis conducted by Trussell Technologies, Inc., (2015) for the MRWPCA-Proposed GWR Project and also includes analysis for the Project Variant. However, the conclusions of the analyses utilizing different methodologies as well as the various available water quality data are consistent as discussed further below. The impact conclusion is based on the approach, methodology, and results analyzed in **Appendix D3** and the methodology and results identified in **Appendix D4**.

An important point to note is that the water quality of the source water entering the MPWSP Desalination Plant is a key driver of the assessed water quality of the discharges, which would depend on the water intake or extraction process. During project operations, as the ocean water would pass through the seafloor sediments into the proposed subsurface intake wells, constituents (such as metals, organics, and man-made compounds) would come into contact with microbes, sediment particles, and organic matter, which would break down some of the compounds and remove others.

Sediments containing organic matter function to remove contaminants in two ways. First, contaminants with chemical characteristics that give them relatively low solubility in water tend to adsorb, or get attached to, sediment particles. Second, contaminants with chemical characteristics that give them relatively high solubility in water tend to be absorbed by the sediment organic matter (Chiou and Kile, 2000). Consequently, it is highly probable that the concentration of constituents present in the source water would be reduced to below ambient levels by the time the water reaches the MPWSP Desalination Plant. An example of the first type of contaminants is organic compounds such as PCBs, chlordane, and DDT that have a high likelihood of adsorbing to the sediment particles as the water travels through subsurface sediments to the intake wells. As a result, the concentration of such constituents in the source water entering the MPWSP Desalination Plant would be reduced and be present at much lower concentrations than the water in the bay (Luthy, 2015). The estimated water quality of the discharge in this analysis is therefore considered to be a conservative “worst case” scenario and would be studied further as part of the NPDES permit amendment process in the permitting phase of the project.

While the desalination process would concentrate the remaining constituents, the mass of constituents being delivered to the MPWSP Desalination Plant (and therefore, returned to the ocean as brine) would be less than the mass of those constituents returned to the ocean if the

proposed project were to utilize open ocean intakes. This analysis takes a conservative approach, therefore, by using the best available water quality data directly, which could have higher constituent (or pollutant) loading than is anticipated through the use of subsurface intakes.

The water quality of the brine-only and combined discharges was studied by calculating the constituent concentrations at the edge of the ZID upon discharge. For the brine discharge, the concentrations of the constituents identified in the Ocean Plan (**Table 4.3-3**) were estimated under both the methodologies by using 1) quality of the source water entering the MPWSP Desalination Plant, 2) the 42 percent efficacy of the treatment process at the MPWSP Desalination Plant, and 3) the dilution factor estimated upon discharge (see Section 4.3.2, the Ocean Plan discussion under the Regulatory Framework, above).

Water quality data used for source water under the different methodologies included the following:

- Under the first methodology (see **Appendix D3**), two available data sets were used to represent the water quality of the source water entering the MPWSP Desalination Plant:

  – One data set was from a Marina Coast Water District well referred to herein as the "well data". The well data was collected by Trussell Technologies, Inc., (2010) from a monitoring well located at the Marina State Beach approximately 5,000 feet south of the proposed MPWSP Seawater Intake System site at the CEMEX property. This data set was used for the constituent concentrations in the source water for two reasons: (1) the data was collected from a well, and (2) the monitoring well is located at a close proximity to the proposed MPWSP Seawater Intake System site. However, only a single water quality sampling was conducted at this location so this data represents only one data point of constituent concentrations in source water.

  – The second data set consisted of the ambient concentrations in Monterey Bay reported under the CCLEAN herein referred to as the CCLEAN-data. The CCLEAN data was compiled from time-integrated ocean samples collected over 30-day periods in both the wet season and dry season from September 2008 through April of 2013 and were obtained for two sites in Monterey Bay: the Southern Monterey Bay site and the Northern Monterey Bay site, located approximately 4 and 12 miles respectively, from the discharge site for the proposed project.

  Neither of the two data sets for source water covered the entire suite of constituents regulated under the Ocean Plan, therefore this analysis is developed based on a subset – and not the entire list – of constituents regulated by the Ocean Plan. With the absence of specific source water data, both the data sets were used in the analysis. Using two different data sets to characterize the source water quality allowed for a comparative study as well as a validation of the conclusions drawn from the analysis (see **Appendix D3**). Further, the data tested under CCLEAN were accurate to a substantially lower concentration limit for the monitored constituents due to the much lower method reporting limits used (in nanograms per liter) in laboratory analysis of the CCLEAN samples as compared to the tests for the well data (mg/L). Due to the higher reporting limits used for the well data, several constituents could not be detected; the same constituents that were tested under CCLEAN showed a detectable, and a much lower concentration value.

Because the data sets employed different testing technologies and reporting limits and showed a wide range of concentrations for several constituents, a tiered approach was taken to best utilize the existing data. The constituent concentrations in the brine were studied first by using the well-data, which had higher reporting limits but analyzed samples for a wider variety of water quality constituents, and then studied by using the CCLEAN-data which was analyzed using substantially lower reporting limits, but had results for fewer constituents as compared to the well data (**Appendix D3**).

- Under the methodology outlined in the Ocean Plan (**Appendix D4**), only one data set was used as source water consisting of the constituent concentrations monitored in Monterey Bay under CCLEAN.

The constituent concentrations in the brine were calculated using the available data for source water quality as stated above and 42 percent efficacy of the desalination process at the MPWSP Desalination Plant.

The methodology in **Appendix D4** was based on the Implementation Provisions in the Ocean Plan, which used the background concentrations for five constituents as provided in *Table 3* of the 2012 Ocean Plan (*page 14*; SWRCB, 2012b) – for arsenic, copper, mercury, silver, and zinc; for other constituents, the background concentration was assumed to be zero. However, the background seawater concentrations provided in the Ocean Plan apply to the entire coast of California and do not necessarily accurately reflect the ambient concentrations near the MPWSP project area in Monterey Bay.

The dilution ratios (or factors) were used to determine the constituent concentrations at the edge of the ZID upon discharge of the brine. Both methodologies used the dilution factors for the discharges that were estimated as part of the modeling analysis of salinity performed by Flow Science, Inc. (2014) (see **Appendix D2**). Flow Science, Inc. (2014) used two analytical methods — Semi-Empirical Analysis (SEA) and Visual Plumes (VP) modeling — to characterize and understand the range of dilution that might be expected to occur for the discharge from the MRWPCA outfall diffuser; both methods are consistent with the regulatory approach recommended by the SWRCB for analyzing the brine discharge (Flow Science, Inc., 2014; SWRCB, 2012b). The range of dilution depends on the nature of the brine discharge plume. **Figure 4.3-4** above illustrates the likely trajectories of a brine discharge: a plume is buoyant when the density is lower than the ambient salinity and it rises; and a plume is sinking or negatively buoyant when the density is higher than the ambient salinity and it sinks (see **Appendix D2** for details).

The VP method is widely used in diffuser discharge analyses; however, because it has only recently been validated against limited experimental data for sinking plumes, data from the SEA method is presented for redundancy in the analysis and confirmation of the results (Flow Science, Inc., 2014). Therefore, the impact determination for this analysis relies on the modeling results using the SEA method for the negatively buoyant (sinking) plume and the VP method for the rising plume.

In the case of the combined discharge, in addition to the above components, the constituent concentrations were calculated under both the methodologies using the wastewater quality data from 2008-2014 obtained from MRWPCA and CCLEAN[31] (Refer to **Appendices D3** and **D4**) and the relative proportions of brine and the wastewater flows in the discharge. To account for the variation in the wastewater flows throughout the year (see **Table 4.3-7**), the constituent concentrations under the combined discharge were studied first, for a higher wastewater flow of 19.78 mgd and then for a lower flow of 0.25 mgd (for details, refer to **Appendix D3**). The combined discharge was studied for the month of January as a representative time for the Davidson season, when the oceanic conditions allow for lowest extent of dilution and mixing compared to the upwelling and oceanic seasons (see **Appendix D1** for details).

The impact conclusion was based on the constituent concentrations at the edge of the ZID that were calculated using the dilution ratios estimated by Flow Science, Inc. (2014) under the near-field salinity modeling analysis (refer to the *Methodology for Salinity* below) for the brine-only and combined discharges and how the concentrations compared against the water quality objectives. The final impact conclusion reflects consideration of the constituents that exceeded the water quality objectives under both the analyses (**Appendices D3** and **D4**).

Due to the varying quantities of treated wastewater discharged through the MRWPCA outfall during the course of a year, the water quality impact from the combined discharge was assessed first, for an average flow of 19.78 mgd (non-irrigation season; see *Methodology for Salinity* below for further information) and then for flows as low as 0.25 mgd (amongst the lowest in the dry season). The dilution ratio used for calculating constituent concentrations at the edge of the ZID for the existing wastewater (baseline) discharge was a minimum of 1:145 required under the MRWPCA's NPDES Permit for the wastewater discharge (R3-2014-0013). Under the proposed project, the dilution ratio estimated for the brine discharge was 1:16 (brine: seawater) and for the combined discharge was 1:68 at wastewater flow of 19.78 mgd (in the Davidson season). A reduced dilution ratio of 1:17 was used to calculate the constituent concentrations in the combined discharge with lower wastewater volumes (that of 0.25 mgd).

In the case of constituents that were not detected in the source water or the wastewater, the highest documented reporting limit was used as a discrete concentration in the analysis (a conservative but not necessarily representative approach). The impact significance was determined based on detected constituents in the source water (for brine-only discharge) and both in the source water and wastewater (for combined discharge). For the constituents that showed exceedances in the combined discharge, their concentrations were reviewed in the source water and the wastewater. Any exceedances[32] attributable to higher concentration in the wastewater were not considered as an impact from the brine-discharge alone, rather a combination of the brine with the wastewater. Any exceedances under the wastewater discharge scenario are

[31] Maximum concentrations in the data were used for this analysis.
[32] Exceedances for detected constituents as well as exceedances for constituents that were not detected. In the case of constituents that were not detected, they were recorded at concentrations less than their method reporting limits and where the reporting limits were lower than the concentration of those constituents in the wastewater.

assumed to be reviewed by MRWPCA and the RWQCB under the current NPDES Permit (R3-2014-0013).

Results and Impact Discussion – Ocean Plan Water Quality Constituents

Based on the detailed analysis of the water quality data (see **Appendices D3 and D4**), the brine-only and combined discharges would largely comply with the water quality objectives for all assessed constituents with the exception of PCBs. The combined discharge with higher wastewater flow of 19.78 mgd (during the non-irrigation season) was estimated to form a rising plume because of the lower density (due to the lower salinity) of the discharge compared to the ambient ocean water density (Flow Science, Inc., 2014 and refer to **Impact 4.3-5** below). The discharge formed from a combination of the brine and wastewater as well as its release through the multi-port diffuser of the MRWPCA outfall would result in greater mixing with the ocean water and a higher dilution ratio of 1:68. With no exceedances, the combined discharge with higher (19.78-mgd) wastewater flow would result in a less-than-significant impact.

Conversely, the brine-only discharge was estimated to form a negatively buoyant (sinking) plume because of its higher density (Flow Science, Inc., 2014 and refer to **Impact 4.3-5** below), which would also apply to the combined discharge with low or 0.25-mgd wastewater flow. The brine discharge and combined discharge with 0.25-mgd wastewater flow were found to result in a PCB-level of 0.00012 µg/L and 0.000345 µg/L respectively and exceed the water quality objective of 0.000019 µg/L, which would be a significant impact.

The higher concentration of PCBs resulting from the brine discharge and the combined discharge with 0.25-mgd wastewater flow would be a function of one, their concentration in the source water, which gets further concentrated in the desalination process and two, of the dilution achieved by the discharges.

One – the PCBs' concentrations in the source water – as discussed in Section 4.3.1, Setting and **Table 4.3-4**, the water quality monitoring data over the past decade shows an increase in the ambient PCBs' levels in Monterey Bay since 2006 where the levels exceed the water quality objective for PCBs in majority of the water samples. Therefore, further concentration of the existing PCB-levels through the desalination process would expectedly increase the PCB-levels to greater than its water quality objective. Also as discussed above, this analysis takes a conservative approach and uses the source water or the Monterey Bay water quality data directly and assuming no attenuation of constituent concentrations as the water travels through approximately 200 feet of sand and sediment material to the subsurface intake wells and then piped to the MPWSP Desalination Plant. The resulting brine water quality therefore represents a conservative scenario with a higher PCB-concentration than is likely to occur under realistic operational conditions (Luthy, 2015; also see a discussion above in Section 4.3.2 Regulatory Framework under Ocean Plan). This can be ascertained by testing the source water before it is routed to the MPWSP Desalination Plant.

Two – the dilution ratio of the discharges – compared to the required minimum dilution ratio of 1:145 at which the treated wastewater is currently discharged, the brine-only discharge would

have a much lower dilution ratio (1:16) and would result in higher constituent concentrations resulting in an exceedance in PCBs over its water quality objective. This would also apply to the combined discharge with 0.25-mgd wastewater flow that would have a low dilution ratio of 1:17. Thus, with a lower dilution ratio, the discharges would result in higher constituent concentrations and vice versa with higher dilution ratios. Higher dilution therefore would aid in avoiding exceedances.

Detailed modeling analysis conducted for studying salinity levels from the brine-only and combined discharges (see **Appendix D2** and Impact 4.3-5 below) showed higher dilution ratios when brine was discharged at higher flow rates in the case of brine-only discharge and when brine was discharged along with higher wastewater flows (at least 19.78 mgd) in the case of combined discharge. In the case of combined discharges, it was observed that a higher dilution ratio achieved by commingling the brine with a higher wastewater flow (dilution ratio of 1:68) showed a lower PCB-concentration compared to the combined flow of brine and a low wastewater flow (dilution ratio of 1:17)[33].

An additional study of the discharges was conducted by MRWPCA immediately prior to the EIR release (See Addendum in **Appendix D4**), which incorporated the most current condition of the outfall (i.e., higher number of open diffuser ports (130) at the outfall compared to the initially used 120 open ports and an additional combined discharge scenario (besides listed in **Table 4.3-9**) with a moderate wastewater flow (9 mgd)). The study also incorporated 0.1 mgd of "hauled brine", which is trucked to the Regional Wastewater Treatment Plant and blended with the treated wastewater prior to being discharged (Trussell Technologies, Inc., 2015; See **Appendix D4**).

The study showed that the dilution ratio achieved by the brine-only discharge slightly increased from 1:16 to 1:17 and showed the same exceedance (i.e., for PCBs[34]). For the combined discharge scenario, a dilution ratio of 1:22 was reported. This discharge with 9-mgd-wastewater flow showed an exceedance in PCBs and ammonia. As previously discussed, the combined discharge with low wastewater flows (0.25 mgd) showed an exceedance only in PCBs, while the combined discharge with high wastewater flows (19.78 mgd) showed no exceedances. In the case of the combined discharge with high wastewater flow, the discharge resulted in a rising plume with relatively higher ocean mixing within the ZID. The potential Ocean Plan exceedance for the discharge emerged when the treated wastewater was not present at a sufficiently higher flow to dilute the brine, and thus the combined discharge was denser than seawater, forming a sinking plume with relatively low mixing within the ZID. Similarly, as discussed previously, there was no exceedance in ammonia under the brine-with-low-(0.25-MGD)-wastewater discharge scenario, where despite the relatively low ocean mixing within the ZID, the ammonia concentration in the discharge was less because the wastewater formed a smaller fraction of the overall discharge.[35]

[33] This is particularly applicable to the constituents which had higher concentrations in the source water than in the wastewater.
[34] Concentration of PCBs (0.00012 µg/L) was the same as that under the study with 120 open ports.
[35] Ammonia was reported at 36,400 µg/L in the wastewater. There was no data available for ammonia under CCLEAN. The well data included ammonia and it was not detected at a method reporting limit of 50 µg/L. As discussed above, due to the undetected value, the method reporting limit was used as the concentration of ammonia

The ammonia concentration however increased near the point where the brine was discharged with the highest flow of wastewater (i.e., 9 mgd) that still resulted in a sinking plume (Trussell Technologies, 2015). **Table 4.3-9** below summarizes the constituents that were found to potentially exceed the Ocean Plan water quality objectives and therefore would have a significant impact.

TABLE 4.3-9
CONSTITUENTS THAT WOULD EXCEED THE WATER QUALITY OBJECTIVE RESULTING FROM DISCHARGES FROM THE PROPOSED PROJECT

Discharge Scenario	Dilution Ratio*	Constituents That Would Exceed Water Quality Objectives	Constituent Concentration at the Edge of the ZID (µg/L)	Ocean Plan Water Quality Objective
Brine-only	1:17	PCBs	**0.00012**	0.000019 µg/L
Combined Discharge (Brine-with-wastewater)	1:68 (with19.78-mgd wastewater)	PCBs	0.000019**	
	1:17 (with 0.25-mgd wastewater)	PCBs	**0.000345**	
	1:22 (with 9-mgd wastewater)***	Ammonia	**626**	600 µg/L

NOTE: Constituent concentrations that are found to exceed the Ocean Plan water quality objectives are shown in **bold**.
For reference, the effluent limitation for PCBs in the current NPDES Permit (R3-2014-0013) is 0.002774 µg/L at the edge of the ZID.

* The dilution ratio requirement for the current wastewater discharge under the NPDES Permit (R3-2014-0013) is 1:145.
** PCBs were found at the level of the water quality objective under the combined discharge scenario with 19.78-mgd wastewater flow.
*** Based on the additional study conducted by MRWPCA (see Addendum in Appendix D4), which also assumed 130 open diffuser ports as against 120 open diffuser ports assumed in the previous studies.

SOURCE: Appendix D3 and Appendix D4

The impact resulting from the exceedances under these scenarios would be minimized to a less-than-significant level by implementing **Mitigation Measure 4.3-4 (Implement Protocols to Avoid Exceeding Water Quality Objectives at the Edge of the ZID)**, which would ensure exceedances over water quality objectives are avoided.[36] The mitigation measure would be implemented following the source water and brine water quality testing during the NPDES Permit amendment process as part of the project permitting phase. The water quality would be tested for the entire suite of constituents and as per protocol (e.g., the intervals and the duration of sampling) in coordination with and approval from the RWQCB.

Impact Conclusion – Ocean Plan Water Quality Constituents

The water quality impact was studied for the discharges resulting from the operation of the MPWSP Desalination Plant: brine-only discharge primarily during the dry weather or summer months and combined discharge when the brine would combine with treated wastewater flows when available (higher flows during the wet weather or winter months and low flows during the

in the source water, in turn resulting in a concentration of 86 µg/L in the brine Also, see **Appendix D4** for further details

36 The water quality testing will involve a larger suite of constituents than those studied in this analysis. This mitigation measure is developed based on the exceedances observed by analyzing the available data and can be modified based on the water quality results.

dry weather). The impact was determined based on the Ocean Plan water quality objectives at the edge of the ZID as the significance threshold.

The water quality analysis used the best available information and the impact conclusion was based on detected constituents in the discharge streams and water quality data collected from Monterey Bay under CCLEAN to represent source water entering the MPWSP Desalination Plant. Based on the analyses, both the brine-only discharge and combined discharge (with low – 0.25-mgd – wastewater flow) were found to result in an exceedance over the water quality objectives for PCBs defined in the Ocean Plan at the edge of the ZID. The combined discharge with moderate wastewater flow of 9 mgd was found to result in an exceedance in PCBs and ammonia. This would be a significant impact, which would be minimized to less-than-significant levels through implementation of **Mitigation Measure 4.3-4 (Implement Protocols to Avoid Exceeding Water Quality Objectives at the Edge of the ZID)**. The mitigation would involve incorporating design features and/or operational measures following source water and discharge quality testing prior to operating the MPWSP Desalination Plant. Examples of the design features and operational measures include temporary storage of brine and its batched release at higher flow rates, treatment of the source water and/or the discharge(s), and temporary storage of brine and its release along with the greater than 20-mgd- wastewater in the case of the combined discharge. These operational changes or measures along with the additional analysis of the constituents that were not detected or could not be analyzed would be incorporated as part of the process of amendment of the MRWPCA NPDES Permit (R3-2014-0013). The proposed project would result in a less-than-significant impact with mitigation.

Mitigation Measures

Mitigation Measure 4.3-4 applies only to the discharge from the MPWSP Desalination Plant through the existing MRWPCA outfall.

> **Mitigation Measure 4.3-4: Implement Protocols to Avoid Exceeding Water Quality Objectives at the Edge of the ZID.**
>
> As part of the amendment process for the existing MRWPCA NPDES Permit (Order No. R3-2014-0013, NPDES Permit No. CA0048551), an extensive water quality assessment will be required by the Regional Water Quality Control Board (RWQCB), including a waste disposal study of the new discharge(s), which, at a minimum, assesses the impact of the water quality and the increased discharge volume on permit compliance and on the minimum probable initial dilution at the point of discharge. Prior to operation of the MPWSP, the discharger(s) will be required to test the source water in accordance with protocols approved by the RWQCB. If CalAm cannot demonstrate to the RWQCB and the MRWPCA through the water quality assessment that the water at the edge of the zone of initial dilution (ZID) will meet the Ocean Plan water quality objectives, then the new discharge(s) may only be released via the existing outfall with the following design features and/or operational measures being implemented, individually or in combination (unless the RWQCB directs that different but equally effective measures be employed) to reduce the concentration of constituents to be in conformance with the Ocean Plan water quality objectives and amended NPDES permit requirements:

- Additional pre-treatment of source water to the Desalination Plant: Feasible methods to remove polychlorinated biphenyls (PCBs) and other organic compounds from the source water include additional filtration or use of granular activated carbon (GAC) - a U.S. Environmental Protection Agency-approved method. GAC acts as a very strong sorbent and can effectively remove PCBs and other organic compounds from the source water (Luthy, 2015).
- Treatment of discharge: Several alternative feasible methods exist to remove residual compounds from the discharge to meet water quality objectives at the edge of the ZID. These methods include the following:
    - Use of GAC (similar to that under the additional pre-treatment of source water);
    - Advanced oxidation with ultraviolet light with concurrent addition of hydrogen peroxide. This method is successfully 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 oxidizes compounds that are difficult to adsorb with activated carbon, and requires a relatively small footprint;
    - Biologically active filtration downstream of ozone treatment to reduce the concentration of ammonia and residual organic matter present in the ozone effluent and to reduce the solids loading on the membrane filtration process. The filtration system would consist of gravity-fed filter basins with granular media and ancillary systems such as an alkalinity addition system for pH control, backwash water basin (also used for membrane filtration backwash), and backwash water basin and pumps.
- Temporary storage and release of brine: When sufficient quantities of treated wastewater for discharge from the Regional Wastewater Treatment Plant to meet Ocean Plan objectives at the edge of the ZID are not available, brine from the Desalination Plant could be temporarily stored onsite in the 3-million-gallon brine storage basin 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.

4.3.3.6 Secondary Impacts of Mitigation Measure 4.3-4

Potential secondary impacts associated with implementation of **Mitigation Measure 4.3-4 (Implement Protocols to Avoid Exceeding Water Quality Objectives at the Edge of the ZID)** are discussed below. Secondary impacts would be associated with the treatment methods and any pumping facilities that may be installed as part of **Mitigation Measure 4.3-4**.

GAC facility to treat the source water and/or brine:

- The GAC facility would consist of GAC adsorption equipment likely consisting of a series of pressure vessels, a building and a backwash system similar to the proposed pressure filtration pretreatment system. Based on the preliminary MPWSP Desalination Plant design, the GAC units could be accommodated within the currently proposed building

footprint. The installation of the GAC facility would be a part of the construction activities associated with the MPWSP Desalination Plant site within the existing footprint and would not create new or additional impacts beyond those discussed for the construction at the site in this EIR. The impact would be less than significant.

- Treatment of the source water (as opposed to the brine) could potentially be provided by GAC filter-adsorbers that would be similar to the proposed pressure filtration pretreatment system. If GAC adsorption of the source water were to replace or supplement the proposed conventional filtration process, water quality of the drinking water delivered to the distribution system would likely improve as measured by lower concentrations of organic compounds, total organic carbon, disinfection byproducts; fewer tastes and odors; and more stable chlorine residuals. Other benefits might include reduced fouling potential at the RO membranes. The impact would be less than significant.

- Operation of the GAC adsorption process will 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 4.7, Hazards and Hazardous Materials**)**. For example, the federal Toxic Substances Control Act of 1976 and the Resource Conservation and Recovery Act of 1976 authorized the USEPA to regulate the generation, transportation, treatment, storage, and disposal of hazardous waste. The Resource Conservation and Recovery Act was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the "cradle to grave" system of regulating hazardous wastes. Further, the California Occupational Safety and Health Act (OSHA) of 1973 would apply to handling of spent GAC material onsite. The California OSHA addresses California employee working conditions, enables the enforcement of workplace standards, and provides for advancements in the field of occupational health and safety. Thus, handling, transportation, and disposal of the spent GAC material generated at the MPWSP Desalination Plant site 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 would result in an increase in energy use, in particular if there is additional pumping necessary. The system could operate using the pressure of the brine stream, or it may require an intermediate pumping station. It is anticipated that operation of the GAC adsorption system would thus increase the energy use at the proposed MPWSP Desalination Plant. The impacts resulting from increased energy use from the proposed project are discussed in Section 4.11, Greenhouse Gas Emissions and Section 4.18, Energy Conservation, and the secondary impacts from the operation of the GAC adsorption system are discussed below.

    - Section 4.11, Greenhouse Gas Emissions, identifies the increase in greenhouse gas emissions due to increased energy use from the proposed project as a significant and unavoidable impact. Any increase in the energy usage beyond those discussed would increase the severity of the significant impact. Therefore, in this case, operating the GAC adsorption system would contribute to a significant and unavoidable impact.

    - As described in Section 4.18, Energy Conservation, CalAm's operational electrical power demand for water production under the proposed project (including water produced from the MPWSP Desalination Plant, Seaside Groundwater Basin production wells, ASR system, and the Carmel River) is estimated to be

approximately 48,200 megawatt-hour (MWh) per year. Therefore, the net increase in annual electrical power demand for water production would be approximately 40,500 MWh per year. The proposed project is the result of a multi-year planning effort that has entailed consideration of a wide range of alternatives to provide replacement water supplies to CalAm customers. The proposed project would not consume energy wastefully or inefficiently. The GAC adsorption system for removing organic compounds from the source water and/or the brine would be employed to ensure that the brine discharged to the bay would comply with the water quality standards or regulatory requirements, which are protective of the beneficial uses of the bay. Therefore, electricity consumed as a result of project operations, including that from operating of the GAC system, would not be wasteful or inefficient, therefore, the increase in the energy use for any GAC adsorption system would be less than significant.

As discussed in Section 4.18, Energy Conservation, implementation of the proposed project would increase CalAm's total electrical demand by approximately 40,500 MWh per year, which would represent approximately 1.5 percent of the County's electricity usage in 2012 (2,643,000 MWh). Pacific Gas and Electric (PG&E), the power provider in the project area, would have adequate capacity and infrastructure to support the proposed project. Electric power for implementation of the proposed project could be accommodated by the existing local and regional energy supplies and the impact would be less than significant. An incremental increase in the energy use from the operation of the GAC adsorption system would be accommodated within the existing capacity. Therefore, the secondary impact would be less than significant.

- Maintenance of the GAC system would involve removing and replacing the GAC, which would be accommodated within the proposed operations and maintenance of the MPWSP Desalination Plant; therefore, the impact is considered less than significant.

Advanced oxidation system and facility to treat the brine:

- 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 Desalination Plant site and would not create new or additional impacts beyond those discussed for the construction at the site in this EIR.
- The advanced oxidation process would generate minimal byproducts and no residuals compounds or liquid or solid waste. The quality of the brine discharged to Monterey Bay would improve as a result of the removing organic compounds. The impact related to solid or liquid waste and disposal would therefore be less than significant.
- Implementing the advanced oxidation system would result in an increase in energy use. It is anticipated that operation of the advanced oxidation system would thus increase the energy use at the proposed Desalination Plant. The impacts resulting from increased energy use from the proposed project are discussed in Section 4.11, Greenhouse Gas Emissions, and Section 4.18, Energy Conservation and the secondary impacts from the operation of the advanced oxidation are discussed below:
    - Section 4.11, Greenhouse Gas Emissions, identifies the increase in greenhouse gas emissions due to increased energy use from the proposed project as a significant

and unavoidable impact. Any increase in the energy use beyond those discussed would increase the severity of the significant impact. Therefore, in this case, operating the GAC adsorption system would contribute to a significant and unavoidable impact.

- Section 4.18, Energy Conservation, CalAm's operational electrical power demand for water production under the proposed project (including water produced from the MPWSP Desalination Plant, Seaside Groundwater Basin production wells, ASR system, and the Carmel River) is estimated to be approximately 48,200 MWh per year. Therefore, the net increase in annual electrical power demand for water production would be approximately 40,500 MWh per year. The proposed project is the result of a multi-year planning effort that has entailed consideration of a wide range of alternatives to provide replacement water supplies to CalAm customers. The proposed project would not consume energy wastefully or inefficiently. The GAC adsorption system for removing organic compounds from the source water and/or the brine would be employed to ensure that the brine discharged to the bay would comply with the water quality standards or regulatory requirements, which are protective of the beneficial uses of the bay. Therefore, electricity consumed as a result of project operations, including that from operating of the GAC system, would not be wasteful or inefficient, therefore, the increase in the energy use for any GAC adsorption system would be less than significant.

  As discussed in Section 4.18, Energy Conservation, implementation of the proposed project would increase CalAm's total electrical demand by approximately 40,500 MWh per year, which would represent approximately 1.5 percent of the County's electricity usage in 2012 (2,643,000 MWh). PG&E, the power provider in the project area, would have adequate capacity and infrastructure to support the proposed project. Electric power for implementation of the proposed project could be accommodated by the existing local and regional energy supplies and the impact would be less than significant. An incremental increase in energy use from the operation of the advanced oxidation system would be accommodated within the existing capacity of PG&E. Within the MPWSP Desalination Plant site, this could require increasing the capacity of the power distribution system to accommodate the additional electrical load, however this would not entail additional construction or installation activities. The secondary impact is considered less than significant.

- The advanced oxidation system would require a liquid hydrogen peroxide chemical storage and feed system onsite. Under the proposed project, the MPWSP Desalination Plant operations would involve the use and storage of chemicals to remove performance-reducing deposits from the pretreatment filtration system and RO membranes, as well as chemicals to adjust product water quality. The impact from routine transport, use, or disposal of hazardous materials during project operations is discussed under Impact 4.7-6 in Section 4.7, Hazards and Hazardous Materials. As discussed in the section, CalAm, as required by law, would submit a Hazardous Materials Businss Plan (HMBP) for the project facilities to the Monterey County Environmental Health Division prior to the start of project operations. The HMBP is required to include information on hazardous material handling and storage, including containment, site layout, and emergency response and notification procedures in the event of a spill or release. In addition, the plan requires annual employee health and safety training. The plan must be approved by the County prior to commencement of project construction and the project facilities would be subject to post-construction compliance inspections. The HMBP would also provide the local

agencies with the information they need to plan appropriately for a chemical release, fire, or other incident, which would reduce the potential for an accidental release to cause harmful health effects to workers or the public or substantial degradation to soil or water quality. Compliance with these various regulations would ensure this impact is less than significant. No mitigation measures are necessary. The hydrogen peroxide storage and feed system for the advanced oxidation system would be included as part of the HBMP and be subject to the regulatory requirements described for other chemicals proposed to be stored, used, and handled onsite and would not result in a new or significant impact. The secondary impact therefore would be less than significant.

Biologically Active Filtration System to treat the brine

The biologically active filtration system would consist of gravity-fed 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 wastewater), 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 at the plant).

The biologically active filtration system would be installed within the existing footprint of the Regional Wastewater Treatment Plant. Construction and operation of the system would not result in additional or more severe secondary impacts to the environment beyond those discussed in this EIR. The secondary impact from the biologically active filtration system would be less than significant.

Pumping to release brine at a higher discharge rate

Construction and operation of the pumps required to discharge the brine at a higher flow rate would require increased energy use, which would be accommodated within the existing energy production and distribution capacity of PG&E. Please refer to the discussions of energy use and its secondary impact under the GAC adsorption and advanced oxidation systems above. The secondary impact from greater pumping for releasing the brine would be less than significant, however the increased energy use would contribute to a significant and unavoidable impact from greenhouse gas emissions.

Impact 4.3-5: Violate water quality standards or waste discharge requirements for salinity, or degrade water quality from increased salinity as a result of brine discharge from the operation of the MPWSP Desalination Plant. (*Less than Significant*)

Summary – Salinity

This impact analysis focuses on whether the brine and the combined discharges (introduced in Impact 4.3-4 above) would exceed the significance threshold for salinity, i.e., result in salinity greater than 2 ppt over ambient salinity levels. The salinity levels are analyzed in the near field (within the ZID) and in the far field (beyond the outer edge of the ZID). The near-field analysis

was specifically developed to address the amendment to the Ocean Plan (2014; 2015) that proposes a new salinity standard of not increasing the salinity levels to greater than 2 ppt over ambient salinity. The far-field analysis was developed to address comments received during the proposed project scoping period on the fate and travel path of the brine plume beyond the near field. The brine and combined discharges (discussed in Impact 4.3-4) would result in salinity levels that would be less than 2 ppt greater than ambient salinity. Therefore the impact would be less than significant.

MPWSP Desalination Plant Operation and the Discharge Scenarios – Salinity

Refer to Impact 4.3-4 for the operational conditions of the MPWSP Desalination Plant and the resulting brine-only and combined discharge scenarios during the summer and winter months respectively.

Approach to Analysis – Salinity

The current NPDES Permit (Order No. R3-2014-0013, NPDES Permit No. CA0048551), which regulates the wastewater discharge from the outfall, would be amended before the MPWSP Desalination Plant comes into operation to incorporate the brine-only and combined discharges. Under the Amended NPDES Permit, the discharges would be subject to the Ocean Plan water quality objectives, which would be incorporated into the permit in the form of specific effluent limitations as water quality requirements.

Based on the proposed amendment to the Ocean Plan (SWRCB, 2014) described in Section 4.3.2, Regulatory Framework, the discharge resulting from the operation of the MPWSP Desalination Plant would result in a significant water quality impact if it would:

- Exceed the ambient salinity at the edge of the ZID by 2 ppt or more.

To address this significance threshold, the salinity impact was analyzed within the ZID, i.e., in the near field. Here, the analysis involved processes that are influenced by the physical brine discharge, the discharge structure, and where the study area was confined to the ZID. Salinity levels at the edge of the ZID were evaluated against the significance threshold of 2 ppt.

This impact analysis also addresses comments received during the project scoping period concerning the brine discharge and its travel path beyond the near field. There are no significance thresholds for the far-field analysis of the discharge plumes. To study the fate of the brine plume (i.e., of brine-only discharge) beyond the ZID, a far-field analysis was conducted using salinity concentrations and is discussed further below. This approach may also be applied to the far-field analysis using other constituents. The far-field analysis is also presented to assist in the evaluation of impacts to marine resources (see Section 4.5, Marine Resources).

Near-Field Analysis – Salinity

Methodology. Flow Science, Inc. (2014; see **Appendix D2**) conducted near-field modeling of the proposed MPWSP discharge through the existing MRWPCA outfall in Monterey Bay. Input to the model included temperature and salinity levels derived from within the ambient water column at

Monterey Bay Aquarium Research Institute Monitoring Station C1 during the period from 2002 and 2012. This monitoring station is located approximately 5 miles northwest of the MRWPCA outfall at the head of the Monterey Submarine Canyon in an area considered representative of ambient conditions for the proposed discharge. The salinity and temperature of ocean water determine its density, which affects the movement of the brine plume upon its discharge. Based on recent data (2010–2012) from the project vicinity, a temperature, salinity, and density profile was developed for the upper 98 feet of the water column for the three oceanic conditions (upwelling, oceanic, and Davidson, as discussed in Section 4.3.1.3, above). As discussed in Section 4.3.1, Setting, salinity in Monterey Bay in the project vicinity as monitored by the Monterey Bay Aquarium Research Institute ranged between 33.1 and 34.2 ppt, with a natural variability of 3.3 percent or approximately 1.1 ppt and a temperature range from 47.5°F to 59.4°F (refer to **Appendix D1** for further information).

An ocean current velocity of zero, which represents a worst-case scenario for dilution, was used for the near-field modeling (Flow Science, Inc., 2014; SWRCB, 2012a). A wastewater-only discharge scenario was modeled for the Davidson oceanic condition to understand the dynamics of the baseline non-irrigation-season condition. The brine-only discharge scenario was modeled for all three oceanic climate conditions,[37] and a combined discharge scenario was modeled for the non-irrigation season. For the combined discharge scenario (No. 3.1), the analysis incorporated data on salinity, temperature, and total dissolved solids (representative of salinity) measured in the treated wastewater from the MRWPCA Regional Wastewater Treatment Plant.[38]

The near-field modeling was conducted for the three oceanic conditions (upwelling, oceanic, and Davidson), as discussed in Section 4.3.1.3, above (**Table 4.3-10**). Consistent with the recommendations in the SWRCB's technical report on discharges from desalination plants (SWRCB, 2012a), the near-field modeling analysis studied the plume behavior in terms of the density (a function of temperature and salinity) and flow rate of the discharge.

TABLE 4.3-10
NEAR-FIELD SCENARIOS MODELED FOR SALINITY

Scenario No.	Oceanic Conditions	Month	Discharge	Discharge Rate (mgd)	Time of the Year for Project Analysis
0.0	Davidson	January	Treated Wastewater	19.78	Non-irrigation season (wet months: November through March)
3.1	Davidson	January	Combined Discharge (Brine and Treated Wastewater)	33.76 (13.98 + 19.78)	
2.1	Davidson	January	Brine	13.98	Irrigation season (dry months: April through October)
1.1	Upwelling	July	Brine	13.98	
4.1	Oceanic	September	Brine	13.98	

SOURCES: Flow Science, Inc., 2014. See **Appendix D2**. The analysis was also conducted using low wastewater volumes of up to 2 mgd.

37 The brine-only discharge during the non-irrigation season (January) is a less likely operating scenario because at least some wastewater would flow through the outfall, along with the brine, throughout the year. Nonetheless, this scenario was evaluated during the Davidson condition (January), as was the MRWPCA wastewater-only discharge, to understand how the brine would influence existing conditions.

38 Wastewater monitoring data from the MRWPCA Regional Wastewater Treatment Plant for salinity and total dissolved solids (1998–2012) and for temperature (2006–2012).

The differences between the salinity levels in the discharge stream and in the ambient or the receiving water were calculated by determining the size of the brine plume, its trajectory in the ocean and the dilution of the brine with the ambient seawater within the ZID. As discussed above in Section 4.3.2, Regulatory Framework, under the Ocean Plan, the ZID (or the regulatory mixing zone) is defined as the zone immediately adjacent to a discharge where momentum and buoyancy-driven mixing produces rapid dilution of the discharge (Flow Science, Inc., 2014). The size of the plume and the extent of dilution would depend on whether the plume is positively buoyant (rising) or negatively buoyant (dense or sinking) (see **Figure 4.3-4**). In the near-field analysis for a sinking plume, the ZID would end at a point where the plume contacts the seafloor. The ZID for a buoyant plume would end at the point where the plume reaches the water surface or attains a depth level where the density of the diluted effluent plume becomes the same as the density of ambient water (i.e., the "trap" level).

Two analytical methods — Semi-Empirical Analysis (SEA) and Visual Plumes (VP) modeling — were used to characterize and understand the range of dilution that might be expected to occur for the discharge from the MRWPCA outfall diffuser; both methods are consistent with the regulatory approach recommended by the SWRCB for analyzing the brine discharge (Flow Science, Inc., 2014; SWRCB, 2012b). The VP method is widely used in diffuser discharge analyses; however, because it has only recently been validated against limited experimental data for sinking plumes, data from the SEA method is presented to provide redundancy in the analysis and confirmation of the results (Flow Science, Inc., 2014). Therefore, the impact determination for this analysis relies on the modeling results using the SEA method for the negatively buoyant (sinking) plume and the VP method for the rising plume. See **Figure 4.3-4** above.

Impact Analysis and Discussion - Salinity. As discussed in the Approach To Analysis above, the potential water quality impact related to salinity resulting from the brine-only and combined discharges is analyzed for the near field (the immediate vicinity of the diffuser port upon discharge) and the far field (the area in the Bay as the plume travels away from the diffuser port). The near-field analysis for salinity was based on modeling conducted within the mixing zone (i.e., the ZID). Near-field modeling was conducted for brine-only discharges (Scenario 2.1, 1.1, 4.1 in **Table 4.3-9**), combined discharge (Scenario 3.1), and a scenario representative of the baseline condition consisting only of wastewater discharge (Scenario 0.0).

Table 4.3-11 shows the modeling results for the sinking plume under the SEA method and for the rising plume under the VP method. The discharges are listed in the order of their dilution (i.e., starting from the maximum dilution and proceeding down to minimum or no dilution). The edge of the ZID for a negatively buoyant (sinking) plume is shown in the shaded column in **Table 4.3-11** as the horizontal distance from the point of discharge (the diffuser port of the outfall) to the centerline of the brine plume as it contacts the seafloor, and was estimated at 12 feet for the brine-only discharge under all oceanic current conditions under the SEA method—well within the 100-meter (or 328-foot) regulatory mixing zone recommended by the SWRCB (2012a) (see **Figure 4.3-4**). Under the VP method, the edge of the ZID was estimated at 27 feet for the buoyant plume associated with the wastewater-only flows (baseline/existing conditions) and

47 feet for the combined discharge. The extent of dilution estimated under the SEA Method for brine-only discharge was at 1:16 under upwelling (July) and oceanic (September) conditions and 1:17 under Davidson conditions (January), and at 1:68 under the VP method for the combined discharge.

TABLE 4.3-11
DILUTION AND HORIZONTAL DISTANCE ESTIMATED UNDER THE NEAR-FIELD ANALYSIS FOR SALINITY

	Scenario No.	Discharge Flow (mgd)	SEA Method			VP Method		
			Plume Diameter (inches)	Center-line Dilution	Horizontal Distance from Port (or to Edge of the ZID) (feet)	Plume Diameter (inches)	Average Dilution	Horizontal Distance from Port (or to Edge of the ZID) (feet)
Rising Plume (Positively Buoyant)	0.0 Wastewater-Only (Baseline)	19.78	–	–	27	246	167[a]	27[b]
	3.1 Treated Wastewater and Brine (Combined Discharge)	33.76	–	–	47	230	68[a]	47[b]
Sinking Plume (Negatively Buoyant)	2.1 Brine-Only	13.98	37	17	12	–	–	–
	1.1 Brine-Only	13.98	36	16	12	–	–	–
	4.1 Brine-Only	13.98	35	16	12	–	–	–

NOTE: Modeling results for the sinking plume are shown in the "SEA Method" column and for the rising plume in the "VP Method" column. Dilution is presented as parts of seawater or wastewater (Scenario 3.1) for one part of brine.

[a] For Scenarios 0.0 and 3.1, the dilution values are for centerline dilution because the VP model has been validated for positively buoyant plumes and no significant under-prediction of dilution has been reported.

[b] These values are "trap" levels (the point where the plume reaches the water surface or attains a depth level where the density of the diluted effluent plume becomes the same as the density of ambient water) above the diffuser.

SOURCE: Flow Science, Inc., 2014 (see **Appendix D2**).

The impact analysis for salinity involved evaluating the changes in salinity levels resulting from the brine-only and combined discharges against the significance threshold for salinity and against the baseline or existing discharge conditions (wastewater only, Scenario 0.0) and representative project operations using under a range of oceanic conditions (as shown in **Table 4.3-10**, above). Based on the salinity levels in the Bay in the vicinity of the discharge outfall and a treatment efficiency of 42 percent, the salinity of the brine was estimated to range between approximately 57 and 58 ppt. **Table 4.3-12**, below, provides the volume, velocity, and salinity of the discharge at the diffuser port, as well as the plume salinity at the edge of the ZID and its salinity level compared with the ambient or ocean-water salinity. The discharges are listed in the order of their dilution (i.e., starting from the maximum dilution and proceeding down to minimum or no dilution).

TABLE 4.3-12
SALINITY LEVELS FROM THE BRINE DISCHARGE AT THE EDGE OF THE ZID

Scenario No.	Brine Stream Discharge (mgd)	Discharge Velocity (feet/ second)	Oceanic Condition (Month)	Brine Salinity (ppt)	Ambient Salinity at Diffuser (ppt)	Plume Salinity at the Edge of the ZID		VP Method (ppt)	Increase Over Ambient Salinity (ppt)	Units Above Ambient Salinity (ppt)	Complies with the Proposed Ocean Plan Salinity Standard? <2 ppt Over Ambient Salinity?
						SEA Method (ppt)	Increase Over Ambient Salinity (ppt)				
0.0[a] (Baseline, Wastewater-Only)	19.78	11.5	Davidson (January)	0.8	33.36			–	–	–	Yes
3.1[a] (Combined Discharge)	33.76	15.2	Davidson (January)	24.23	33.36			–	–	–	Yes
2.1 Brine (January)	13.98	9.5	Davidson (January)	57.40	33.36	34.8	1.5				Yes
1.1 Brine (July)	13.98	9.5	Upwelling (July)	58.23	33.84	35.4	1.5				Yes
4.1 Brine (September)	13.98	9.5	Oceanic (September)	57.64	33.50	35.00	1.6				Yes

NOTES:

* As discussed under the heading Methodology, above, the results are reported for the negatively buoyant (sinking) plume (applicable to the brine-only discharge scenario) under the SEA method and for the rising plume (applicable to the baseline and combined discharge scenarios) under the VP method.

[a] '–' indicates a rising plume. Scenarios 0.0 and 3.1 for the combined discharge (non-irrigation or wet season) are estimated to result in a rising plume in which the plume salinity is lower than that of the seawater; therefore, these levels are not reported in the table.

SOURCES: Flow Science, Inc., 2014.

As shown in **Table 4.3-12**, the baseline condition (represented by the wastewater-only discharge scenario) results in a rising plume since the plume has a low density due to the very low salinity (0.8 ppt). The discharge is estimated to form a buoyant plume with the highest plume diameter (246 inches) compared to other scenarios (**Table 4.3-11**) and result in a dilution ratio of 1:167 with seawater.

The combined discharge (during the non-irrigation season) is also estimated to form a rising plume because of the lower density (due to the lower salinity) of the discharge compared to the ambient ocean-water density (and salinity) (Flow Science, Inc., 2014). Conversely, the brine-only discharge (during the irrigation season) is estimated to form a negatively buoyant (sinking) plume because of its higher density (and salinity). The higher density would result from the greater salinity (~57 to 58 ppt) of the brine compared to the ambient salinity (over 33 ppt) under all three oceanic conditions (Flow Science, Inc., 2014).

As shown in **Table 4.3-12**, the salinity level of the brine discharged from the diffuser port would be reduced from an estimated 57 to 58 ppt to approximately 34-35 ppt at the edge of the ZID under the SEA method. This reduction in salinity would occur as the brine is discharged through the 120-port diffuser and mixed with seawater. The maximum salinity of the plume at the edge of the ZID is estimated under the SEA method to exceed ambient salinity by 1.6 ppt under the Oceanic period (September) and 1.5 ppt in the Davidson and Upwelling periods (January and July). Thus, based on the near-field analysis for salinity, the brine and combined discharges would remain below the significance threshold of 2 ppt above ambient salinity, and would result in a less-than-significant impact.

Impact Conclusion – Near-Field Salinity

The analysis of salinity levels indicates that the brine and combined discharges would result in salinity less than 2 ppt above ambient salinity. The proposed project would therefore not exceed or violate the salinity standards or degrade water quality in terms of salinity. The impact would be less than significant.

Far-Field Analysis – Salinity

Unlike the near-field analysis, the far-field analysis evaluates processes that are primarily influenced by natural ocean turbulence. As part of the analysis, calculations were performed to determine the pre-mitigation dilution rates of the brine plume as it travels beyond the edge of the ZID. Salinity levels in the far field were calculated and compared against ambient salinity levels and mapped for the three oceanic conditions.[39]

Methodology – Salinity

ESA conducted a far-field analysis of the plume's fate, transport, and resulting salinity levels using data on ocean currents derived from the Regional Ocean Modeling System (ROMS) model, which is one of the models recommended in the SWRCB's technical report on discharges from desalination plants (SWRCB, 2012b). The ROMS model was used to define the seasonal distribution of temperature, salinity, and currents at the point of discharge in Monterey Bay. To

[39] This analysis is conducted using salinity; similar analyses may be conducted using other constituents.

estimate the plume salinity levels, ESA used a far-field particle-tracking model to calculate the dilution rates of the plume (before mitigation) as it traveled farther from the point of discharge beyond the edge of the ZID. The far-field particle-tracking model was used to calculate the dilution rates of the plume as it traveled farther from the point of discharge beyond the edge of the ZID. In the model, the mass of the plume is comprised of a number of particles or discharged packets of water (see **Appendix D1)**.

Based on the dilution rate achieved in the near field within the ZID (Flow Science, Inc., 2014), the plume's dilution rates were modeled over a period of 90 days at a depth of approximately 98 feet (or 30 meters, which is the approximate water depth at the diffuser) under three oceanic conditions: Davidson season (December to February), upwelling season (June to August), and oceanic season (August to September). During these seasons, the water temperature ranged from between 47.3 and 59.4 °F, and the salinity ranged from between 33.1 and 34.2 ppt, with a natural variability of 3.3 percent (refer to **Appendix D1** for further information). For standardization of the oceanographic variables used for this study, the two parameters were converted to Absolute Salinity and Conservative Temperature based on the International Thermodynamic Equations of Seawater or TEOS.

The far-field study continues forward from the point where the near-field analysis ends and assumes there is no interaction between the near- and far-field mixing zones. The dilution was modeled on a two-dimensional scale, where only lateral mixing was assumed with no vertical mixing. No large-scale motions or external forces, such as currents induced by wave action, were considered; therefore, this scenario involves the least conducive conditions for dilution and hence is considered conservative. The study assumes there are no currents at the initial dilution of the brine plume in the near field and that in the far field the ocean currents are spatially homogeneous, which means the oceanic current velocities are the same spatially throughout the flow field. This assumption is most applicable at early stages of the brine discharge,[40] therefore a limited time frame of 48 hours was selected to compute the final salinity concentration of the particles. The modeling analysis involved releasing a particle of the brine discharge every 30 minutes and following the particle for 48 hours, for the course of a season (~90 days), meaning that each "discharge" (its salinity) was tracked for 48 hours over 90 days of discharge (see **Appendix D1**) and compared with the ambient salinity levels.

Impact Analysis and Discussion – Salinity

The proposed project would result in 13.98 mgd of brine, which would be discharged into Monterey Bay through the MRWPCA outfall. Prior to discharge, the brine would combine with wastewater from the MRWPCA Regional Wastewater Treatment Plant when it is available (during the wet, or non-irrigation, season). This far-field analysis was conducted for the brine-only discharge scenario when the wastewater would not be available.

The ROMS model was used to define the seasonal distribution of temperature, salinity, and the currents at the point of discharge and in Monterey Bay. Based on the dilution rate of the plume

[40] This assumption tends to under-predict the extent of dilution over larger distances. Refer to **Appendix D1** for details.

under the modeling analysis, the salinity levels of the brine discharge dissipate rapidly with time as the plume travels away from the point of discharge.

Two types of salinity levels were identified: chronic and peak. Chronic levels refer to the average of the particle salinity levels over 3 months or 90-day season of the oceanic current conditions selected, which in terms of impacts on biological species represent longer-term exposure to average salinity levels above the ambient. Acute (peak) levels refer to maximum (or instantaneous maximum) salinity values, which from a biological perspective represent exposure to maximum salinity levels in the short term or a short timeframe. **Table 4.3-13** shows the average values of chronic and acute salinity levels in the shaded columns.

TABLE 4.3-13
AVERAGE CHRONIC AND ACUTE SALINITY LEVELS ESTIMATED FOR THE BRINE PLUME IN THE FAR FIELD AT A DEPTH OF 98 FEET

Oceanic Conditions	Brine Salinity at Point of Discharge (ppt)	Brine Salinity at Edge of ZID[a] (ppt)	Ambient Salinity (ppt)	Average of Chronic Plume Salinity[b] (ppt)	Plume Salinity Relative to Ambient Salinity (ppt)	Average of Peak Plume Salinity[b] (ppt)	Plume Salinity Relative to Ambient Salinity (ppt)
Davidson (January)	57.40	34.8	33.52	33.74	+0.22	34.13	+0.61
Upwelling (July)	58.23	35.4	34.00	34.24	+0.24	34.58	+0.58
Oceanic (September)	57.64	35.00	33.66	33.9	+0.24	34.26	+0.60

NOTE:
[a] Refer to Table 4.3-13 for the near-field modeling results of the brine salinity at the edge of the ZID.
[b] Average plume salinity is the average salinity over 48 hours.

SOURCE: Monterey Peninsula Water Supply Project – Far-Field Modeling and Mixing Analysis of the Brine Discharge Technical Memorandum (see **Appendix D1**).

As shown in **Table 4.3-13**, the pre-mitigation brine salinity in the range of 57-58 ppt was estimated to reduce at the edge of the ZID to between 34 and 35 ppt (also discussed previously under the near-field modeling analysis). Outside the ZID, the far-field analysis over 48 hours indicated further dissipation of the plume salinity, where the average chronic salinity was found to range between 33 and 34 ppt—approximately 0.2 ppt greater than the ambient salinity and where the average of acute salinity was found to be at approximately 34 ppt and the average acute values were approximately 0.6 ppt greater than the ambient salinity under all three oceanic current conditions. These reductions in salinity were observed as the brine plume traveled further away from the discharge point and mixed with ocean water. The ambient conditions that affect this mixing vary as a result of seasonal weather cycles and can also be substantially modified by global ocean climate events. Other ambient conditions that contribute to the mixing and dilution of the plume are bathymetry,[41] currents and waves, and differences in density (due to variations

[41] Bathymetry refers to physical features and topography within the ocean.

in temperature, salinity, etc.) between the plume and the receiving waters. **Appendix D1** provides additional details on the salinity levels.

The model output also represented the spatial extent of the salinity levels likely to occur above ambient salinity and was studied in terms of the brine plume area within which peak salinity levels occur above the ambient salinity for each brine discharge particle for 48 hours as a new particle was released for 90 days. **Table 4.3-14** shows the areal extent of the plume within which there may be points that exhibit salinity levels greater than 1.5 ppt above ambient. These salinity levels are estimated over a 90-day period following the discharge and are present at a time within the 90-day period and do not necessarily represent consecutive days or a continuous time period.

TABLE 4.3-14
SALINITY LEVELS[a] AND THE AERIAL EXTENT ESTIMATED FOR THE BRINE PLUME IN THE FAR FIELD

Oceanic Condition	Brine Salinity at Point of Discharge (ppt)	Brine Salinity at Edge of ZID (ppt)	Ambient Salinity (ppt)	Area with Average Plume Salinity At or Greater Than 1.5 ppt Above Ambient[b] (Acres)	Area with Peak Plume Salinity At or Greater Than 1.5 ppt Above Ambient (Acres)
Davidson	57.40	34.8	33.52	-	-
Upwelling	58.23	35.4	34.00	-	-
Oceanic	57.64	35.00	33.66	-	-

NOTES:

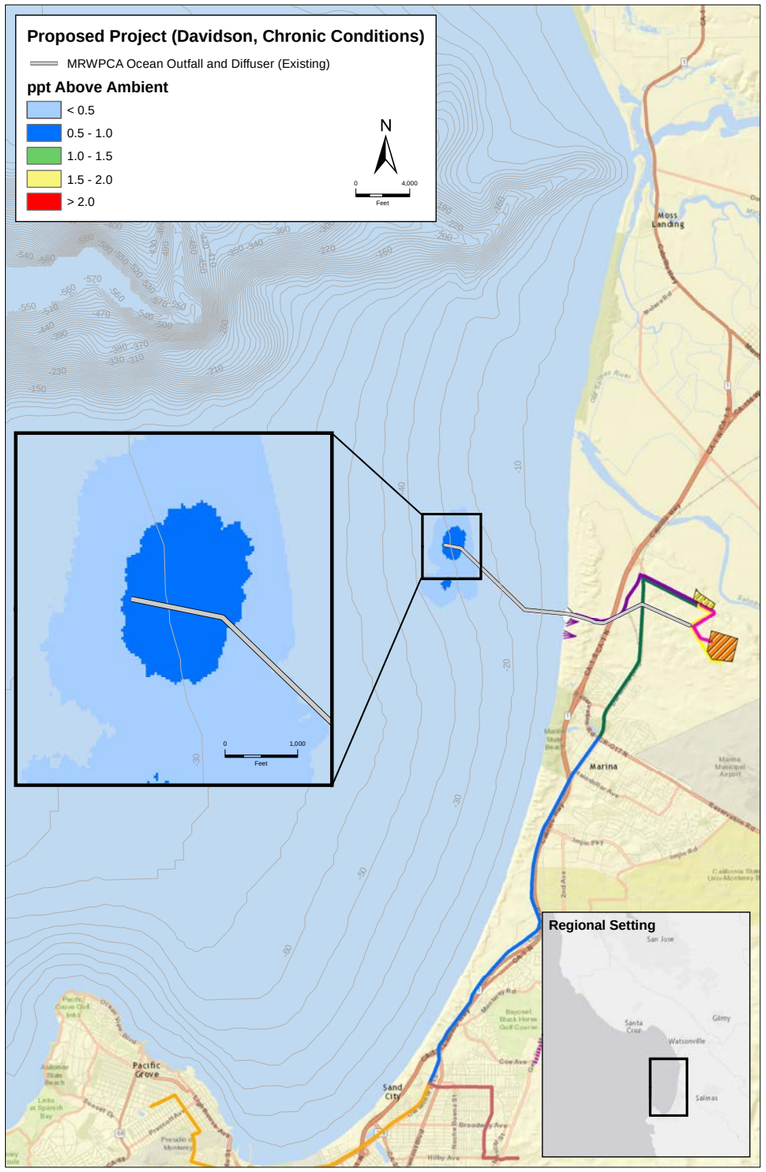
[a] Refer to Table 4.3-13 for the near-field modeling results of the brine salinity at the edge of the ZID.

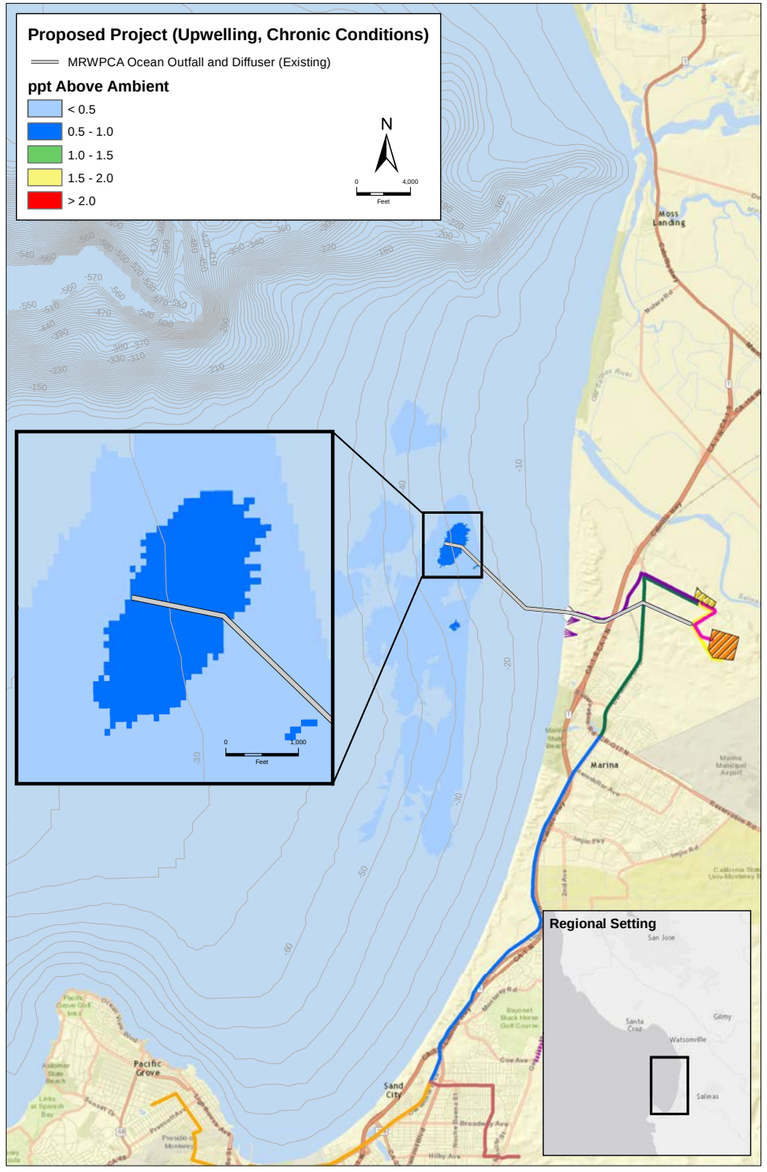
[b] "-" indicates that the average plume salinity was lower than 1.5 ppt above ambient salinity and hence not presented.

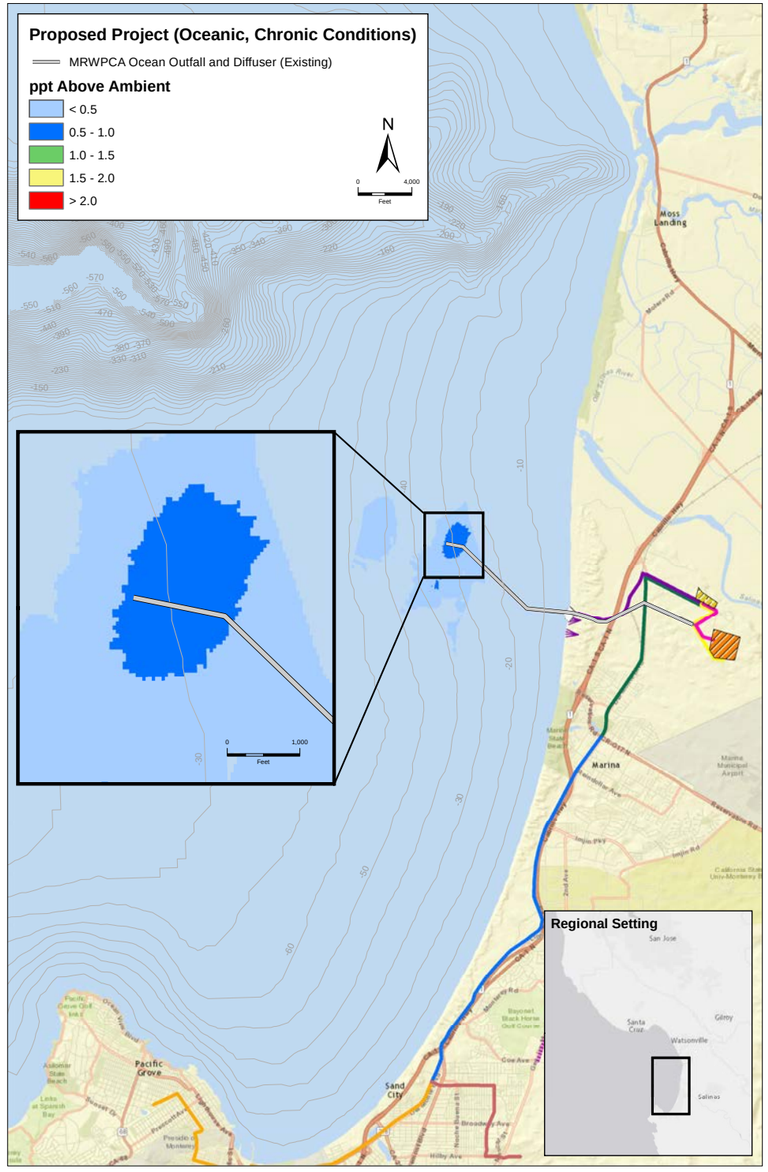
SOURCE: Monterey Peninsula Water Supply Project – Far-Field Modeling and Mixing Analysis of the Brine Discharge Technical Memorandum (see **Appendix D1**)

Both peak and chronic salinity levels were found to be within 1.5 ppt above ambient salinity and are therefore not reported in **Table 4.3-14**. The chronic salinity levels above ambient salinity can be observed through their areal extent in **Figure 4.3-5**. The brine plume was found to have the largest area during the Upwelling season and smallest during the Davidson season (**Figure 4.3-5**). The chronic plume salinity levels were predicted to be below the natural salinity variability of +/- 3.3 percent at all locations. As can be seen in **Figure 4.3-6**, the peak salinity levels were also found to be less than 1.5 ppt greater than ambient salinity and within the natural variability of +/-3.3 percent of ambient salinity.

In both the cases of chronic and peak (acute) salinity levels, the spatial extent of the plume (see **Figures 4.3-5** and **4.3-6**) was found to be directly correlated to the currents from the ROMS model. For example, the rate of both the plume dispersion and dilution was the lowest in the Davidson period (see **Figure 4.3-5**), which has the slowest currents. The greatest dispersion and dilution was observed during upwelling when the plume mostly extends into southern Monterey Bay. Compared to the upwelling season, the plume area was found to be somewhat smaller under the oceanic period, where the plume extended from near the Monterey Submarine Canyon rim to the center of the southern half of Monterey Bay.







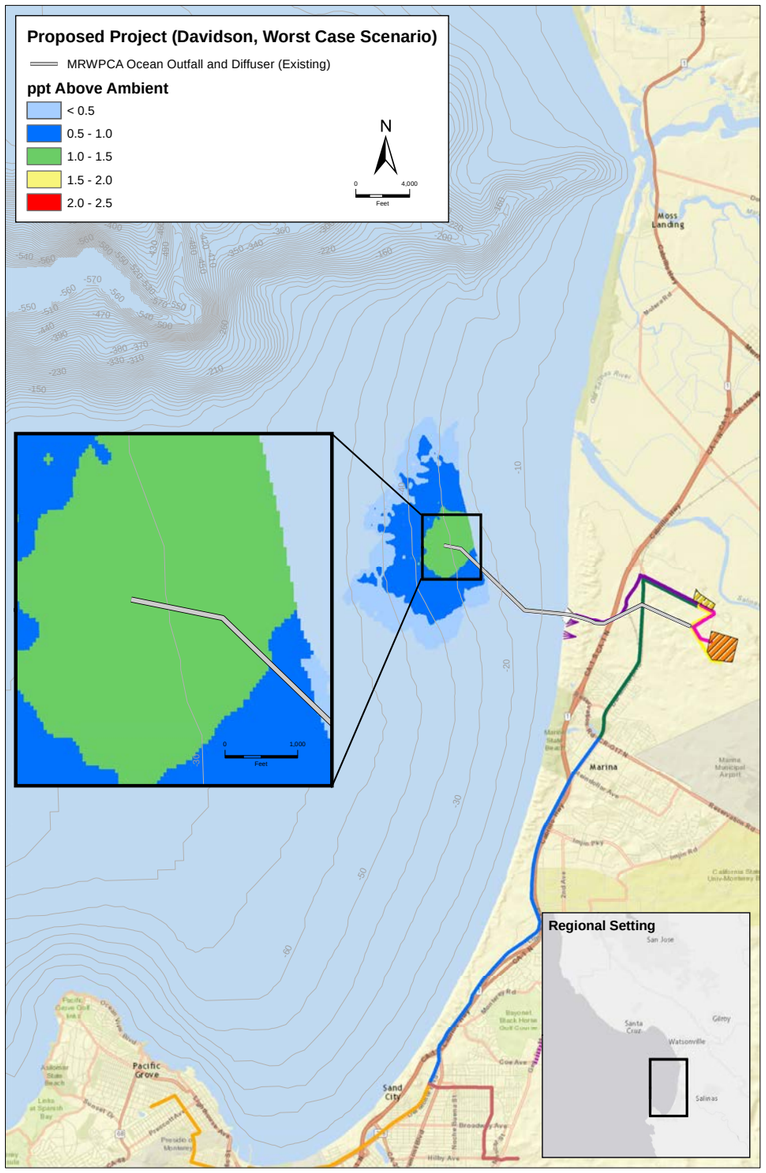
Legend
ppt = parts per thousand
ppt above Ambient = Salinity levels in ppt above the ambient salinity levels.

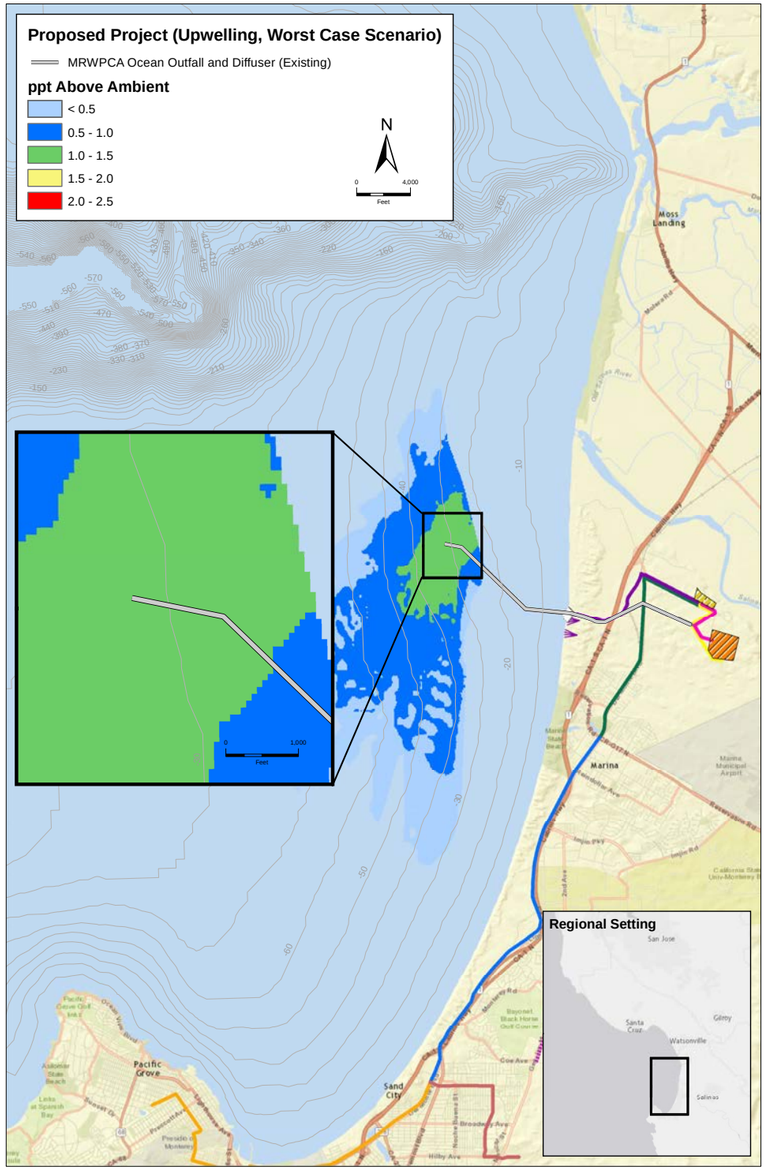
SOURCE: Appendix D1

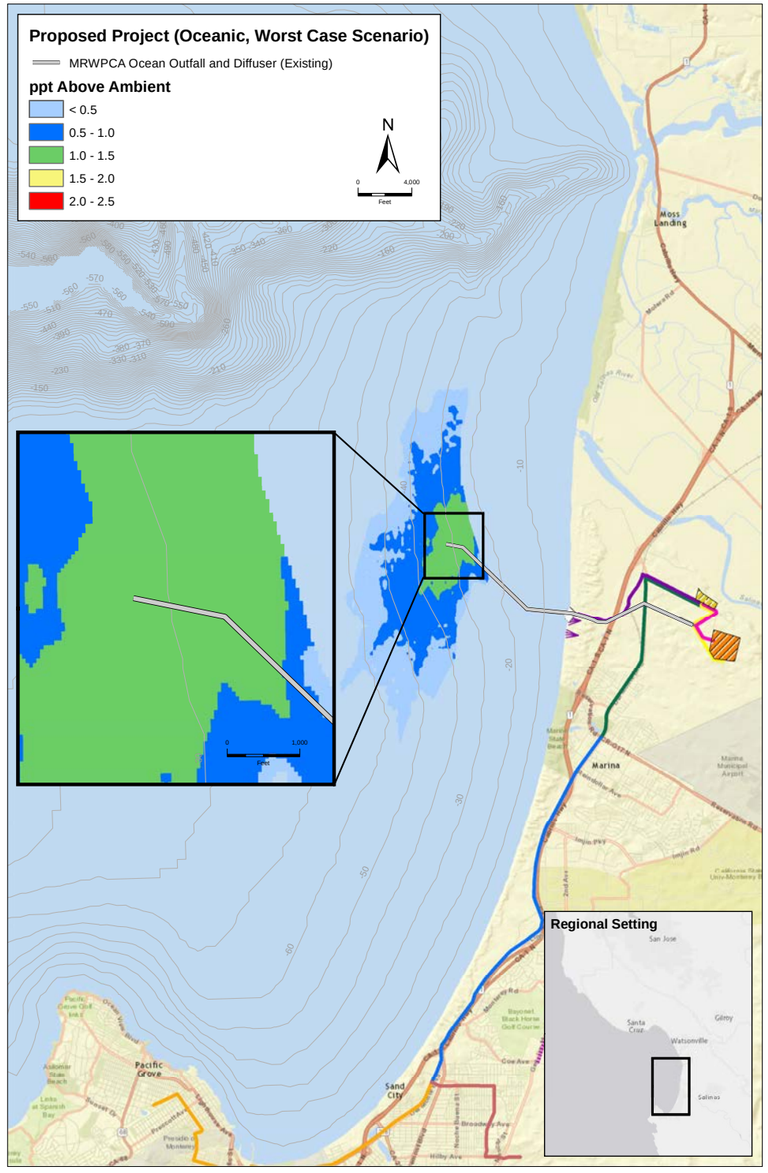
205335.01 Monterey Peninsula Water Supply Project

Figure 4.3-5

Extent of the Brine-only Plume Based on Average (Chronic) Salinity Levels Above Ambient







Legend
ppt = parts per thousand
ppt above Ambient = Salinity levels in ppt above the ambient salinity levels.

SOURCE: Appendix D1

Figure 4.3-6
Extent of the Brine-only Plume Based on Peak (Acute) Salinity Levels Above Ambient

Impact Conclusion – Far-Field Salinity

The analysis of salinity levels indicates that the brine and combined discharges would result in salinity of less than 2 ppt above ambient salinity at the edge of the ZID. The proposed project would therefore not exceed or violate the salinity standards or degrade water quality in terms of salinity. The impact would be less than significant.

The far-field analysis indicated that the brine plume travels away from the point of discharge with time. Although there were no significance thresholds for salinity beyond the ZID, the salinity of the brine plume was estimated to progressively reduce with time and distance from the point of discharge, approaching background salinity levels through dispersion and dilution with the ocean currents. Therefore, the impact would be less than significant and no mitigation is required.

Mitigation Measures

None required.

Impact 4.3-6: Degradation of water quality due to discharges associated with maintenance of the subsurface intake wells and ASR injection/extraction wells. ***(Less than Significant)***

This impact focuses on discharges of effluent generated during maintenance of the subsurface intake wells and ASR-5 and ASR-6 Wells. This impact does not apply to any of the other proposed project facilities.

Subsurface Slant Wells

As described in Section 3.6.1 of Chapter 3, Project Description, the subsurface slant wells would require periodic maintenance every 5 years. Slant well maintenance activities would disturb roughly 10 acres at the CEMEX active mining area. Each wellhead vault would be excavated and uncovered for 1 to 2 weeks during well cleaning operations. Site disturbance would include excavation, stockpiling, and backfilling of beach sand. Spoils stockpiled during earthmoving activities would be susceptible to erosion and could migrate outside of the work area. However, because sand migration is a natural ongoing process along the shoreline, the migration of sand within and to areas adjacent to the CEMEX active mining area would not adversely affect water quality. But toxic chemicals used to maintain heavy maintenance equipment, such as fuels and petroleum lubricants, if not managed appropriately, could be accidentally released to sensitive beach areas and adversely affect shallow groundwater and/or water quality in Monterey Bay.

As described in Chapter 3, Project Description, mechanical brushes would be lowered into the slant wells to mechanically clean the well screens. If chemical cleaning products are needed for maintenance, only environmentally inert products would be used. However, the effluent produced during slant well cleaning could carry sediment or other contaminants that, if discharged directly to the beach area, could adversely affect water quality in Monterey Bay.

Slant well maintenance activities would be considered a “land disturbance activity” and would be subject to the water quality control requirements of the *General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-*

0009, NPDES No. CAS000002) (Construction General Permit) (SWRCB, 2009). Similar to slant well construction activities, the contractor conducting the maintenance would be required to prepare a SWPPP that includes specific measures to manage pollutants generated during maintenance activities. These measures would address the potential adverse effects to water quality associated with equipment fueling and storage, inadvertent releases of toxic chemicals, and discharges of cleaning effluent. The cleaning effluent would be conveyed to portable holding tanks to allow chemical residuals and sediment to settle out, and the decanted water would be subsequently percolated into the ground in the CEMEX active mining area. (See Section 4.3.2.2 and Impact 4.3-1, above, for additional information regarding the Construction General Permit requirements.) Adherence to these requirements would prevent significant water quality impacts during slant well maintenance activities. The impact would be less than significant. No mitigation is necessary.

ASR-5 and ASR-6 Wells

As part of routine maintenance of the ASR-5 and ASR-6 Wells, CalAm facility operators would regularly backflush accumulated sediment and turbid water from the two wells. The duration of the backflushing would range from a few minutes to 2 hours. Water produced during routine backflushing would be routed to the proposed ASR Settling Basin and percolated into the ground. Any backflush effluent in excess of the capacity of the proposed ASR Settling Basin would be conveyed via the new ASR Pump-to-Waste Pipeline to the existing Phase I ASR Pump-to-Waste System located at the intersection of General Jim Moore Boulevard and Coe Avenue. These discharges would be considered "water supply discharges" and would be conducted under the *General Waiver of WDRs for Specific Types of Discharges* (Resolution R3-2008-0010) (General Waiver) (RWQCB, 2008). As such, discharges of backflush effluent would be subject to the conditions of the General Waiver, including the requirements that all discharges occur at distances greater than 100 feet from streams, wetlands, and other water bodies, and that appropriate management practices be implemented to preclude discharging to surface waters and surface water drainage courses. In addition, backflush effluent discharges would be subject to the condition that it would not have chlorine or bromine concentrations that could impact groundwater quality. Compliance with the conditions of the General Waiver would prevent the degradation of water quality during routine maintenance of the ASR-5 and ASR-6 Wells. The impact would be less than significant, and no mitigation is necessary.

Impact Conclusion

Discharges related to periodic maintenance of the subsurface slant wells and routine maintenance of the ASR-5 and ASR-6 Wells would be conducted in accordance with regulatory requirements designed to protect water quality. As a result, the impact would be less than significant for both facility components.

Mitigation Measures

None required.

Impact 4.3-7: Alteration of drainage patterns such that there is a resultant increase in erosion, siltation, or the rate or amount of surface runoff. (*Less than Significant*)

Stormwater runoff volumes and rates generated from undeveloped, unpaved areas can increase significantly when a site is paved, the impervious surface area is increased, and the ability of surface water to infiltrate the ground surface is reduced or eliminated. Impervious surfaces can increase peak flows in creeks, cause erosion, and result in greater nonpoint-source pollution in downstream water bodies. The majority of the proposed facilities would be constructed below ground and would not increase impervious surfaces or alter drainage patterns. However, the proposed project would create new impervious surfaces at the aboveground facilities located throughout the project area.

Subsurface Slant Wells

The subsurface slant wells would be constructed in a previously disturbed portion of the CEMEX active mining area in the city of Marina. The wellheads of the subsurface slant wells would be enclosed in 10-foot-long by 5-foot-wide concrete vaults, buried approximately 5 feet below the sand. Due to their small size and because they would be buried in the sand, the vaults would not impede infiltration or alter drainage patterns. The electrical controls for the slant wells would be enclosed in an electrical control building and an electrical control panel. The electrical panel would be 4 feet long and 2 feet wide; the electrical control building would be 4 feet wide and 12 feet long. Together, these two structures would increase the impervious surface area at the CEMEX active mining area by 56 square feet. This negligible increase in impervious surfaces would not alter drainage patterns, significantly increase erosion or siltation, nor impede the infiltration of stormwater into the dune sands. The impact would be less than significant.

MPWSP Desalination Plant

The proposed MPWSP Desalination Plant site would disturb approximately 25 acres of a 46-acre undeveloped parcel located on Charles Benson Road, northwest of the MRWPCA Regional Wastewater Treatment Plant. The proposed improvements at the MPWSP Desalination Plant site would include laboratory and administration buildings, various treatment and storage facilities, as well as paved parking, driveways, and maintenance areas. The site would add approximately 15 acres of impervious surfaces, which would reduce stormwater infiltration onsite and could increase stormwater runoff from the site. If not managed, an increase in stormwater runoff could increase erosion and/or siltation downstream.

CalAm would be required to comply with the most recent post-construction stormwater control requirements (Central Coast RWQCB Resolution No. R3-2013-0032), which are enforced by the local jurisdictions in accordance with the MRSWMP and the NPDES Municipal Stormwater Permit for MS4s (described in Section 4.3.2, Regulatory Framework, above). As indicated in **Table 4.3-4**, above, the MPWSP Desalination Plant would qualify as a Tier 4 project and CalAm would be required to: incorporate LID measures into site design, treat stormwater runoff, retain a portion of stormwater runoff from the site, and manage flows for the 2- through 10-year storm events such that they match pre-project flows. Post construction stormwater BMPs could include, but would not be limited to, the use of pervious concrete or pavement, bioswales, vegetated swales,

buffer strips, and vegetated retention ponds. CalAm would be required to prepare and implement a post-construction SWMP that details the maintenance schedule for post-construction BMPs. With mandatory compliance with the post-construction stormwater requirements, alterations in drainage patterns at the MPWSP Desalination Plant site would not result in substantial increases in erosion, siltation, or the rate or amount of surface runoff. The impact would be less than significant.

All Pipelines

Once constructed, all of the proposed pipelines would be located entirely underground and the surface along the pipeline alignments would be restored to pre-construction conditions. No substantial long-term changes in drainage patterns would result from implementation of the proposed pipelines. Therefore, no impact would result.

ASR-5 and ASR-6 Wells

The proposed ASR-5 and ASR-6 Wells at the Fitch Park military housing area would add a total or approximately 2,000 to 2,500 square feet of impervious surface due to the addition of the concrete pump houses, electrical transformer, and access driveway for maintenance vehicles. It is assumed that the ASR-5 and ASR-6 Wells would qualify as a Tier 1 project under the post-construction stormwater management requirements (see **Table 4.3-4**, above) and CalAm would be required to implement LID elements into the site design. With adherence to the post-construction stormwater management requirements, this negligible increase in impervious surfaces would not significantly impede infiltration, alter drainage patterns, or increase erosion and siltation. The ASR Pump-to-Waste Settling Basin would not result in an increase in impervious surface that would cause an increase in erosion, siltation, or storm runoff. Therefore, the impact would be less than significant.

Terminal Reservoir and ASR Pump Station

The two 33-foot-high and 130-foot-diameter Terminal Reservoir tanks and 2,000-square-foot ASR Pump Station would be co-located on a 1.8-acre concrete pad in Seaside. The Terminal Reservoir/ASR Pump Station site is currently undeveloped, and the 1.8-acre increase in impervious surface would impede infiltration at the site, increase runoff, and increase erosion and siltation. Terminal Reservoir and ASR Pump Station would qualify as a Tier 4 project under the post-construction stormwater management requirements. As a result, CalAm would be required to incorporate LID measures into site design, treat stormwater runoff from the site, retain a portion of stormwater runoff from the site, and manage peak flows for the 2- through 10-year storm events such that they match pre-project flows. With mandatory compliance with the post-construction stormwater requirements, alteration in drainage patterns at the Terminal Reservoir/ASR Pump Station site resulting from an increase in impervious surfaces would not result in substantial increases in erosion, siltation, or the rate or amount of surface runoff. The impact would be less than significant.

Valley Greens Pump Station

Two alternative sites are being considered for the Valley Greens Pump Station in unincorporated Monterey County: Option 1 is located approximately 400 feet southeast of the intersection of

Carmel Valley Road and Valley Greens Drive; Option 2 is located on the south side of Carmel Valley Road near Carmel Rancho Boulevard, in the northeast corner of the Carmel Rancho Shopping Center. The Valley Greens Pump Station would be enclosed in a 500-square-foot single-story building along with a 100-square-foot electrical control building outside of the pump station building. These structures would add approximately 600 feet of impervious surfaces. This negligible increase in impervious surfaces would not result in a substantial change in drainage patterns, erosion, or siltation. Therefore, the impact would be less than significant.

Impact Conclusion

The MPWSP Desalination Plant, ASR-5 and ASR-6 Wells, and Terminal Reservoir/ASR Pump Station would be subject to the post-construction stormwater management requirements of the municipal stormwater permit and CalAm would be required to implement post-construction stormwater BMPs into the final site designs. With adherence to the post-construction requirements, implementation of these facilities would result in a less than significant impact related to changes in drainage patterns, increased soil erosion, and siltation. Implementation of the Valley Greens Pump Station and subsurface slant wells would result in a less than significant impact. No impact would result from implementation of the proposed pipelines.

Mitigation Measures

None required.

Impact 4.3-8: Alteration of drainage patterns such that there is an increase in flooding on- or offsite or the capacity of the stormwater drainage system is exceeded. (*Less than Significant*)

Increases in impervious surfaces from the proposed aboveground project facilities could decrease stormwater infiltration and increase stormwater runoff from the site. Increased stormwater runoff has the potential to increase flooding in downstream waterways and could potentially exceed the capacity of the stormwater conveyance system.

Subsurface Slant Wells

Implementation of the subsurface slant wells in the CEMEX active mining area, including the electrical control building and electrical control panel, would increase the impervious surface area at the CEMEX active mining area by 56 square feet. This negligible increase in impervious surfaces would not alter drainage patterns, increase flooding on- or off-site, or exceed the capacity of stormwater drainage systems. No impact would result.

MPWSP Desalination Plant

Implementation of the proposed MPWSP Desalination Plant would add approximately 15 acres of impervious surfaces, which would reduce stormwater infiltration onsite and could increase stormwater runoff from the site. If not managed, the increase in stormwater runoff could increase flooding and exceed the capacity of the stormwater drainage system.

As discussed above under Impact 4.3-7, CalAm would be required to comply with the most recent post-construction stormwater control requirements (Central Coast RWQCB Resolution No. R3-2013-0032). As indicated in **Table 4.3-4**, above, the MPWSP Desalination Plant would qualify as a Tier 4 project and CalAm would be required to: incorporate LID measures into site design, treat stormwater runoff, retain a portion of stormwater runoff from the site, and manage flows for the 2- through 10-year storm events such that they match pre-project flows. With mandatory compliance with the post-construction stormwater requirements, any alterations in drainage patterns at the MPWSP Desalination Plant site resulting from increased impervious surfaces would not result in significant impacts related to flooding or flows in excess of the capacity of the stormwater drainage system. The impact would be less than significant.

All Pipelines

Once constructed, all of the proposed pipelines would be located entirely underground and the surface along the pipeline alignments would be restored to pre-construction conditions. No changes in drainage patterns would result from implementation of the proposed pipelines. Therefore, no impact would result.

ASR-5 and ASR-6 Wells

The proposed ASR-5 and ASR-6 Wells at the Fitch Park military housing area would add a total or approximately 2,000 to 2,500 square feet of impervious surface due to the addition of the concrete pump houses, electrical transformer, and access driveway for maintenance vehicles. It is assumed that the ASR-5 and ASR-6 Wells would qualify as a Tier 1 project under the post-construction stormwater management requirements (see **Table 4.3-4**) and CalAm would be required to implement LID elements into the final site design. With adherence to the post-construction stormwater management requirements, any changes in minor drainage patterns and site runoff would not result in flooding or adversely affect the capacity of the stormwater drainage system. Further, the ASR Settling Basin would be used for settling of backflush effluent from the wells. As discussed above, any backflush effluent in excess of the capacity of the proposed ASR Settling Basin would be conveyed via the new ASR Pump-to-Waste Pipeline to the existing Phase I ASR Pump-to-Waste System located at the intersection of General Jim Moore Boulevard and Coe Avenue and would not result in flooding or affect the capacity of the stormwater drainage system. Therefore, the impact would be less than significant.

Terminal Reservoir and ASR Pump Station

Terminal Reservoir and ASR Pump Station would create approximately 1.8 acres of impervious surfaces and would qualify as a Tier 4 project under the post-construction stormwater management requirements (see **Table 4.3-4**). CalAm would be required to incorporate LID measures into site design, treat stormwater runoff from the site, retain a portion of stormwater runoff, and manage peak flows for the 2- through 10-year storm events such that they match pre-project flows. With mandatory compliance with the post-construction stormwater requirements, alteration in drainage patterns at the Terminal Reservoir/ASR Pump Station site from increased impervious surfaces would not significantly increase flooding or exceed the capacity of the stormwater drainage system. Therefore, the impact would be less than significant.

Valley Greens Pump Station

Implementation of the Valley Greens Pump Station would add approximately 600 square feet of impervious surfaces. This negligible increase in impervious surfaces would not result in substantial impacts related to changes in drainage patterns, flooding, or flows in excess of the stormwater drainage system. The impact would be less than significant.

Impact Conclusion

The MPWSP Desalination Plant, ASR-5 and ASR-6 Wells, and Terminal Reservoir/ASR Pump Station would be subject to the post-construction stormwater management requirements of the municipal stormwater permit and would be required to implement post-construction BMPs into final site designs. With adherence to the post-construction requirements, implementation of these facilities would result in a less than significant impact related to changes in drainage patterns, increased flooding, and exceedance of downstream stormwater drainage system capacity. Implementation of the Valley Greens Pump Station and subsurface slant wells would result in a less than significant impact. No impact would result from implementation of the proposed pipelines.

Mitigation Measures

None required.

Impact 4.3-9: Impedance or redirection of flood flows due to the siting of project facilities within a 100-year flood hazard area. (*Less than Significant*)

The subsurface slant wells and portions of the Source Water Pipeline and Monterey Pipeline would be constructed in a 100-year flood hazard area.

Subsurface Slant Wells

As shown in **Figure 4.3-2**, the subsurface slant wells would be located within the 100-year coastal flood hazard area. The subsurface slant wells would be constructed at the western terminus of the CEMEX access road and just south of the CEMEX settling ponds. The wellheads would be enclosed in concrete vaults buried approximately 5 feet below the sand. Because the proposed subsurface slant wells would be buried, they would not impede or redirect flood flows in the area. Therefore, the impact would be less than significant.

Source Water Pipeline and Monterey Pipeline

Portions of the Source Water Pipeline in Marina and Monterey Pipeline in Monterey would be located within 100-year coastal flood hazard areas (see **Figure 4.3-3**). However, once constructed, these pipelines would be located underground and would not impede or redirect surface flood flows in the area. The impact would be less than significant.

All Other Project Components

None of the other project components are located within a 100-year flood hazard area. Therefore, no impact related to the impedance or redirection of flood flows in a 100-year flood hazard area would result.

Impact Conclusion

The subsurface slant wells and portions of the Source Water Pipeline and Monterey Pipeline would be constructed in a 100-year flood hazard area. However, these facilities would be placed underground would not impede or redirect flood flows. The impact would be less than significant for the subsurface slant wells, Source Water Pipeline, and Monterey Pipeline. No impact would result from implementation of all other proposed project facilities because none of the other project components are located within a 100-year flood hazard area.

Mitigation Measures

None required.

Impact 4.3-10: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to a tsunami. (*Less than Significant*)

Tsunami damage is typically confined to low-lying coastal areas. As shown in **Figure 4.3-2**, the near-shore margins of Monterey County, including coastal portions of Marina, Seaside, and Monterey, are subject to flooding in the event of a tsunami. The subsurface slant wells in Marina and portions of the Monterey Pipeline in Monterey and Seaside would be located in areas subject to flooding from a tsunami.

Subsurface Slant Wells

The wellheads for the subsurface slant wells would be encased in concrete vaults buried approximately 5 feet below the sand. The wellhead vaults would be designed to withstand inundation. As a result, the slant wells would not be subject to a significant risk of damage from flooding in the event of a tsunami.

The slant wells would be operated remotely using a SCADA system, with routine site visits by facility operators to monitor operations. Because the presence of onsite personnel would be minimal, operation of the subsurface slant wells would not expose facility operators to significant tsunami hazards. The impact would be less than significant for the subsurface slant wells.

Monterey Pipeline

Because the Monterey Pipeline would be located underground and designed to withstand inundation, it would not be subject to a significant risk of damage from flooding in the event of a tsunami.

Site visits from facility operators associated with pipeline operations and maintenance would be limited to annual inspections of the cathodic protection system, testing and servicing of valves,

vegetation maintenance, and repairs of minor leaks in buried pipeline joints or segments. Pipeline operations and maintenance would not expose personnel or structures to significant risks from flooding in the event of a tsunami. The impact would be less than significant.

All Other Project Components

None of the other project components are located within a tsunami inundation zone. Therefore, no impact would result.

Impact Conclusion

The MPWSP would not expose people or structures to a significant risk of loss, injury, or death from flooding due to a tsunami. The impact would be less than significant for the subsurface slant wells and Monterey Pipeline. For all other facilities, no impact would result.

Mitigation Measures

None required.

Impact 4.3-11: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise. (*Less than Significant*)

Coastal flooding impacts would be short-term (from storm tides) and long-term (from sea level rise). Short-term impacts from coastal flooding could occur during 100-year storm events and include coastal erosion, which is discussed under Impact 4.2-6 in Section 4.3, Geology, Seismicity, and Soils, and impedance or redirection of flood flows, which is discussed under Impact 4.3-9, above. This impact focuses only on the long-term impacts related to exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise.

The proposed project could expose project facilities to long-term flooding from sea level rise. The subsurface slant wells, the northernmost portion of the MPWSP Desalination Plant site, and portions of the Source Water Pipeline and Monterey Pipeline would be located in areas that could be subject to sea level rise. However, because the subsurface slant wells and the two pipelines would be constructed underground and designed to withstand inundation, these facilities would not be subject to a significant risk of damage from flooding due to sea level rise. The proposed aboveground facilities at the 40-acre MPWSP Desalination Plant site would be constructed on the upper terrace of the site and at elevations higher than the predicted 2100 sea level elevation. The desalination facilities would be designed so as to minimize the risk from flooding due to sea level rise. The impact would be less than significant.

Subsurface Slant Wells

The subsurface slant wells in Marina would be located in the CEMEX active mining area. This area is subject to sea level rise as shown in **Figure 4.3-3**. The wellheads for the slant wells would be encased in concrete vaults buried 5 feet below the sand and would be designed to withstand

inundation. Therefore, the slant wells would not be subject to a significant risk of damage from flooding due to sea level rise. The impact would be less than significant.

MPWSP Desalination Plant

According to reports related to climate change and sea level rise (see the discussion of Coastal Flooding and Sea Level Rise under Section 4.1.3.4, above, for further details), during the lifetime of the desalination facilities (approximately 50 years), the sea level in the project vicinity is projected to rise by a total of 27.5 inches (2.3 feet). The mean sea level rise trend in Monterey Bay is estimated at approximately 0.053 inches per year (NOAA, 2013b).

The MPWSP Desalination Plant site is located in close vicinity of the areas subject to flooding from sea level rise (see **Figure 4.3-3**). The MPWSP Desalination Plant would be located at elevations between 85 and 110 feet above msl, which is greater than the sea level rise of approximately 2.3 feet estimated to occur during the lifetime of the proposed project (the next 50 years). Thus the MPWSP Desalination Plant site facilities would not be subject to flooding and would not expose people or structures to risk from flooding due to sea level rise during the lifetime of the proposed project. Therefore, the impact on proposed project facilities would be less than significant.

Source Water Pipeline and Monterey Pipeline

Portions of the proposed Source Water Pipeline in Marina and of the Monterey Pipeline in Seaside and Monterey (see **Figure 4.3-3**) would be located in areas that would be subject to flooding from sea level rise. 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 impact would be less than significant.

All Other Proposed Facilities

None of the other proposed facilities would be located in areas that would be subject to flooding from sea level rise. No impact would result.

Impact Conclusion

The MPWSP would not expose people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise. The impact would be less than significant for the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline, and Monterey Pipeline. All other proposed facilities would have no impact.

Mitigation Measures

None required.

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