4.13 MARINE BIOLOGICAL RESOURCES

4.13.1 Introduction

This section addresses the potential for the Proposed Project to affect marine habitats and associated marine biological resources within the project marine biological resources study area. The only potential effect of the Proposed Project on marine habitats and associated marine biological resources would be operational impacts associated with discharges of wastewater from the proposed Treatment Facilities at the Regional Treatment Plant, specifically, the Advanced Water Treatment (AWT) Facility. Applicable federal, state, and local regulations are identified. The analysis of discharge of wastewater from the proposed AWT Facility relies on water quality information presented in **Section 4.11, Hydrology and Water Quality: Surface Water**. Terrestrial biological resources including marine bird species are discussed separately in **Section 4.5, Biological Resources: Terrestrial**. Impacts to fresh water and anadromous fish species are discussed in **Section 4.4, Biological Resources: Fisheries**.

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

- Evaluate discharge of reject concentrate into Monterey Bay or removal of pollutants from the receiving water (Monterey Bay).
- Describe the quality of water sent to the outfall location as opposed to that of the water proposed for injection into the Seaside Groundwater Basin.

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

4.13.2 Environmental Setting

This section describes the regional oceanographic conditions and marine biological resources of Monterey Bay. The impact analysis presented in **Section 4.13.4**, below, focuses only on those resources located within the marine biological resources study area (also referred to as marine study area). For the purposes of this EIR, the marine study area encompasses the nearshore waters of Monterey Bay and extends to the areas surrounding the MRWCPA ocean outfall as shown in **Figure 4.13-1, Marine Biological Resources Study Area**.

The only aspect of the Proposed Project with the potential to adversely affect marine resources is operational discharge of reverse osmosis by-product wastewater generated by the proposed AWT Facility (herein referred to as reverse osmosis concentrate) via the Monterey Regional Water Pollution Control Agency (MRWPCA) existing ocean outfall.

The advanced water treatment process would generate 0.80 to 0.94 million gallons per day (mgd) of reverse osmosis concentrate that would be discharged via the existing MRWPCA ocean outfall. The outfall is currently used to discharge treated wastewater effluent from the MRWPCA Regional Wastewater Treatment Plant. The outfall terminates at the diffuser located approximately 2 miles offshore in 90 to 110 feet below sea level where a soft mud substrate predominates.

4.13.2.1 Monterey Bay National Marine Sanctuary

The marine study area is located in the coastal area of the Monterey Bay National Marine Sanctuary (MBNMS), which was designated as a federally protected area in 1992. The MBNMS is managed by the National Oceanographic Atmospheric Administration (NOAA) and includes coastal waters from Marin to Cambria. The MBNMS includes approximately 276 miles of shoreline, extends an average distance of 30 miles from shore, and encompasses 5,322 square miles of ocean and is more than two miles deep at its deepest point. The MBNMS was established for the purpose of research, education, public use, and resource protection. The MBNMS includes a variety of habitats that support extensive marine life. (Monterey Bay National Marine Sanctuary, 2008).

Section 4.11, Hydrology and Water Quality: Surface Water, describes the hydrology and water quality of Monterey Bay. Monterey Bay has three ocean climate seasons: upwelling, oceanic, and Davidson current (Pennington and Chavez, 2000). The upwelling period, typically occurring mid-February through November, is characterized by higher nutrient concentrations at the surface, where sunlight and stratification of the water column often lead to high primary production and chlorophyll values (see the discussion of pelagic habitat, below, for more details). During the oceanic period, which usually begins in mid-August and continues through mid-October, phytoplankton blooms are intermittent and primarily composed of small phytoplankton. Phytoplankton productivity is lowest in winter months and during the Davidson current period.

4.13.2.2 Special Status Species

MBNMS includes a variety of habitats that support extensive marine life, including 34 species of marine mammals, over 180 species of seabirds and shorebirds, at least 525 fish species, 4 sea turtle species, 31 different invertebrate phyla, and over 450 species of marine algae. Its natural resources include central California's largest contiguous kelp forest, one of North America's largest underwater canyons, and the closest-to-shore deep ocean environment off the continental United States. Its highly productive biological communities host one of the highest levels of marine biodiversity in the world, including 27 federally listed threatened and endangered species (MBNMS, 2008). Federally listed species include six species of large whales, the Southern sea otter (*Enhydra lutris nereis*), Steller sea lion (*Eumetopias jubatus*), Guadalupe fur seal (*Arctocephalus townsendi*), California clapper rail (*Rallus longirostris obsoletus*), western snowy plover, marbled murrelet (*Brachyramphus marmoratus*), four species of sea turtles, six species of salmon or steelhead, the tidewater goby (*Eucyclogobius newberryi*), and black abalone (*Haliotis cracherodii*) (MBNMS 2008). MBNMS is also a meeting place for the geographic ranges of many species. It lies at the southern end of the range for some species, like the Steller sea lion (occurring from central

California north to Alaska and Japan), and the northern end of the range for other species, like giant kelp (*Macrocystis pyrifera*) (occurring from San Francisco south to Baja California, Mexico) (MBNMS, 2008).

MBNMS includes one of four major coastal upwelling regions worldwide. The MBNMS Final Management Plan describes the upwelling process as follows:

> *"Coastal upwelling occurs along the western edges of continents, where winds from the northwest drive oceanic surface waters away from shore due to the Coriolis effect. These shallow, relatively warm waters are replaced by deep, colder and nutrient rich waters driving high primary productivity, allowing phytoplankton to bloom, which in turn support zooplankton, providing a key prey resource for higher-order predators such as fishes, birds, and whales. Globally, these upwelling regions rival the productivity of tropical rain forests, and account for nearly 95 percent of the annual global production of marine biomass, in spite of only representing 0.1 percent of the ocean's total surface area."*

The seasonal upwelling that occurs within MBNMS makes Monterey Bay extremely productive in terms of being able to support a variety of species, including some whales and small schooling fish (e.g., sardine, herring). The nearshore midwater zone contains over 80 species of fish, sharks, and rays including flatfish such as halibut, sand dabs, flounder, turbot, and sole, which are closely associated with sandy habitats, as well as surfperch, rockfish, gobies, and sculpins which are normally associated with rocky habitats. Midwater schooling fish include anchovy, herring, smelt, sardines, and silversides. **Figure 4.13-1** shows the existing setting of the marine study area, including habitat designations.

Marine Mammals

All MBNMS marine mammals are protected under the Marine Mammal Protection Act. Several marine mammals are also protected under the ESA. Marine mammals that are known to occur within MBNMS include:

- Steller sea lion (*Eumetopias jubatus*) – Federally threatened
- Guadalupe fur seal (*Arctocephalus townsendi*) – State and Federally Threatened
- Southern sea otter (*Enhydra lutris nereis*) – Federally threatened, State fully protected
- Blue whale (*Balaenoptera musculus*) – Federally endangered
- Fin whale (*Balaenoptera physalus*) – Federally endangered
- Humpback whale (*Megaptera novaeangliae*) – Federally endangered
- North Pacific right whale (*Eubalaena glacialis*) – Federally endangered, State fully protected
- Sperm whale (*Physeter macrocephalus*) – Federally endangered
- Sei whale (*Balaenoptera borealis*) – Federally endangered
- Killer whale (*Orcinus orca*) – Federally endangered
- Gray Whale (*Eschrichtius robustus*) – Delisted, though known to occur during migration
- Short-finned pilot whale (*Globicephala macrorhynchus*) – Not listed

- Baird's beaked whale (*Berardius bairdii*) – Not listed
- Beaked whales (*Mesoplodon* spp.) – Not listed
- Cuvier's beaked whale (*Ziphius cavirostris*) – Not listed
- Northern elephant seal (*Mirounga angustirostris*) – State fully protected
- Northern fur seal (*Callorhinus ursinus*) – Not listed, but considered vulnerable
- Harbor porpoise (*Phocoena phocoena*, San Francisco-Russian River stock, Monterey Bay stock, and Morro Bay stock) – Not listed

Marine mammals most likely to occur in the vicinity of the MRWPCA outfall include the California sea lion, Harbor seal, southern sea otter, and humpback whale. The southern sea otter is common along the Monterey Bay Coast and the humpback whale is sometimes seen at the head of Monterey Canyon and is somewhat likely to be present in the project area. Seasonally, grey whales come in close to shore, and there are sightings of harbor porpoise and multiple species of dolphins. For more information see: http://sanctuarysimon.org/monterey/sections/specialSpecies/index.php) (MBNMS, 2015).

Special Status Fish Species

Several federally or state listed fish species are known to occur in MBNMS:

- Steelhead (*Onchorhynchus mykiss irideus,* south-central California coast distinct population segment [DPS], and central California coast DPS) – Federally threatened[1]
- Chinook salmon (*Oncorhynchus tshawytscha,* central Valley Spring evolutionarily significant unit [ESU]) – Federally and state threatened
- Chinook salmon (*Oncorhynchus tshawytscha,* Central Valley Fall and Late Fall ESU) – Federal and state species of special concern
- Chinook salmon (*Oncorhynchus tshawytscha,* Sacramento River winter-run ESU)– Federally and state endangered
- Coho salmon (*Oncorhynchus kisutch,* central California Coast ESU) – Federally and state endangered
- River lamprey (*Lampetra ayresii*) – State species of special concern
- North American Green sturgeon (*Acipenser medirostris*, Southern DPS) – Federally threatened and state species of special concern
- White sturgeon (*Acipenser transmontanus*) – Federally endangered
- Longfin smelt (*Spirinchus thaleichthys*) – State threatened
- Eulachon (*Thaleichthys pacificus*, Southern DPS) – Federally threatened and state species of special concern

[1] This special status species is also addressed in **Section 4.4, Biological Resources: Fisheries**, related to the freshwater and anadromous fishery biological resources located in the vicinity of the Proposed Project sites.

- Tidewater goby (*Eucyclogobius newberryi*) – Federally endangered and state species of special concern
- Cowcod (*Sebastes levis*) – Federal species of concern and considered overfished
- Bocaccio (*Sebastes paucispinis*) – Federal species of concern and considered overfished and state critically endangered
- Basking shark (*Cetorhinus maximus*, N. Pacific subpopulation) –State endangered

Steelhead and salmon are anadromous species that use both fresh and salt water at different stages in their life cycle (incubation and juvenile rearing in freshwater, maturation at sea, and adult migration into rivers for reproduction). Adults or smolts may use the marine study area in migration to and from coastal streams, and as rearing during early marine residency. Like salmon, sturgeon are anadromous, migrating to the ocean and returning to fresh water to spawn. Green sturgeon are known to forage in estuaries and bays ranging from Monterey Bay to British Columbia. Tidewater goby can be flushed from Elkhorn Slough during tidal events, and the basking shark has been sighted in nearshore waters in Monterey Bay. (For more information see: http://sanctuarysimon.org/monterey/sections/specialSpecies/index.php) (MBNMS, 2015)

Invertebrates

Invertebrate species in MBNMS include squid, sponges, anemones, jellies, worms, corals, tunicates, snails, octopus, clams, and arthropods such as barnacles, crabs, and spot prawns. Thousands of various species of invertebrates populate MBNMS. Most invertebrate species are not harvested commercially, with the exception of squid, spot prawn, and Dungeness crab, rock crab, and octopus. Various types of invertebrates are found in all habitats from the sandy beach to intertidal, mid-water, and deep sea.

Black abalone (*Haliotis cracherodii*) is a federally endangered marine invertebrate known to occur in MBNMS. Black abalone are herbivorous gastropods (the same taxonomic class as snails and slugs) that live in rocky ocean waters. Black abalone are reported to be most abundant intertidally, from the mid to lower intertidal zones and potentially down to depths of 6 meters (19.7 feet).

Sea Turtles

Four species of federally listed sea turtles are known to exist within MBNMS: green sea turtle (*Chelonia mydas*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*), and olive ridley sea turtle (*Lepidochelys olivacea*). In the Pacific Ocean, breeding colony populations on the Pacific coast of Mexico of both green sea turtles and olive ridley sea turtles are listed as endangered; all others are listed as threatened.

4.13.2.3 Habitats and Natural Communities

MBNMS encompasses eight different marine and shoreline habitat areas, including rocky shores, kelp forests, sandy bottoms, estuaries, submarine canyons, deep sea, open ocean, and seamounts. Areas that would potentially be affected by the discharges through the MRWPCA ocean outfall are described below. Other areas, including rocky shores, estuaries, submarine canyons, deep sea and seamounts, are located outside of the

marine study area. The marine study area contains designated critical habitat for leatherback sea turtles and green sturgeon, and is also located within designated essential fish habitat (EFH) for groundfish, coastal pelagic species, and Pacific salmon. Each of these habitats is briefly discussed below.

Kelp Forests

Kelp provides a unique and diverse habitat utilized by numerous species, including marine mammals, fishes, other algae, and invertebrates. Just beyond the breaking waves, several species of kelp grow from the hard substrates. Although some individuals can persist for up to three years, the overall structure of the kelp forest is very dynamic. Kelp canopy cover varies seasonally; it is thickest in late summer and thins or disappears when large winter swells remove weakened older adults. The following spring, the next generation of individuals takes advantage of the thin canopy cover and increase in available light to grow rapidly. This, in addition to nutrient rich waters caused by upwelling, allows some species of kelp to grow up to 12 inches per day. The measured productivity (per square foot of sea floor) of a kelp forest is among the highest of any natural community.

In central coastal California, the two primary canopy-forming species in kelp forests are giant kelp (*Macrocystis pyrifera*) and bull kelp (*Nereocystis luetkeana*). Both can be found in the same kelp forest, but giant kelp is more typical of the Monterey Bay area. Some vertebrates, such as sea otters and many fishes, reside within kelp forests; others, such as seabirds, harbor seals, sea lions, and gray whales, visit kelp forests while foraging for food. Giant kelp and other algae also support large populations of benthic invertebrates, which in turn attract higher-order predators.

Sandy Bottoms

Most of the ocean floor within MBNMS is covered with sand or mud. The lack of hard substrate and shifting sand prevent algae or seaweeds from growing. However, many organisms live in the sand, generally in two broad zones: a shallow region dominated by infaunal crustaceans, and a deeper area dominated by tube-dwelling and sedentary polychaete worms. Nearshore areas may have dense beds of sand dollars, and deeper areas may have high numbers of brittle stars and sea pens.

Open Ocean

Although oceans cover 70 percent of the Earth's surface, only 5 percent of the Earth's surface consists of typical marine ecosystems, like coral reefs or kelp forests. The remaining 65 percent make up the open ocean ecosystem, which typically lies well offshore where the water depth is greater than 330 feet. The waters of MBNMS are part of the eastern Pacific Ocean. Open ocean waters are 13,100 feet deep on average and in the Pacific basin reach a maximum depth of 36,000 feet.

Essential Fish Habitat

The MRWPCA's ocean outfall through which the AWT Facility reverse osmosis concentrate would be disposed is located within designated Essential Fish Habitat (EFH) for groundfish, coastal pelagic species, and Pacific salmon. EFH is broadly defined by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Sustainable Fisheries Act to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." EFH is identified for any species managed under a federal fishery management plan. The MSA requires that federal agencies consult with

NOAA Fisheries when taking any action that may adversely affect EFH. The MSA defines an adverse effect as any impact that reduces the quality and/or quantity of EFH (50 CFR 600.810). Additional information about the MSA and the Sustainable Fisheries Act is provided in **Section 4.13.3.1**.

Critical Habitat

The marine study area includes designated critical habitat for green sturgeon and leatherback sea turtle (See **Figure 4.13-1**). NOAA Fisheries designated critical habitat for the threatened southern DPS of green sturgeon in 2009, which extends from Monterey Bay north to Cape Flattery in Washington. Green sturgeon are long-lived, slow-growing fish, and are the most marine-oriented of the sturgeon species. Green sturgeon utilize both freshwater and saltwater habitat and are believed to spend the majority of their lives in nearshore oceanic waters, bays, and estuaries. Younger green sturgeon reside in freshwater, with adults returning to freshwater to spawn when they are approximately 15 years in age and over 4 feet in length. (http://www.fisheries.noaa.gov/pr/species/fish/green-sturgeon.html)

The leatherback sea turtle is the largest turtle and one of the largest living reptiles on earth. The leatherback is the only sea turtle that does not have a hard bony shell, but rather a carapace make of thick, leathery connective tissue. Leatherbacks are known as pelagic (open ocean) animals, but also forage in coastal waters and are the most migratory and wide ranging of sea turtle species. NOAA Fisheries designated approximately 16,910 square miles of critical habitat for leatherbacks along California's central coast in January 2012, stretching from Point Arena in Mendocino County to Point Arguello in Santa Barbara County. (http://www.nmfs.noaa.gov/pr/species/turtles/)

Although not in the marine study area, critical habitat for black abalone is designated along the majority of California's central coast both approximately 20 miles north and 10 miles south of the project area. Critical habitat for Steller sea lions includes the rookeries at Año Nuevo Island, approximately 40 miles northwest of the project marine study area.

Non-native Species

The presence of non-native aquatic species, some of which can be highly invasive and difficult to control, are increasingly common in coastal habitats worldwide. Estuaries, in particular, harbor large numbers of introduced species. Within MBNMS, approximately 40 non-native species are known to exist in Elkhorn Slough approximately 6.5 miles north of the project marine study area, and another small number of species recently were reported in nearshore coastal waters. Non-native species in MBNMS include terrestrial plants and algae (European dune grass, sea rocket, brown alga), invertebrates (sponges, anemone, snails, mussel, clams), and vertebrates (yellowfin goby, American shad, striped bass).

4.13.3 Regulatory and Legal Setting

4.13.3.1 Federal

Federal Endangered Species Act

Under the Federal Endangered Species Act (FESA), the Secretary of the Interior and the Secretary of Commerce jointly have the authority to list a species as threatened or

endangered (16 United States Code [USC] 1533(c)). Multiple species of fish and marine mammals are listed by the USFWS under FESA, as discussed in **Section 4.13.1.3.**

Federal Regulation of Wetlands and Other Waters

The United States Army Corps of Engineers (USACOE) and the United States Environmental Protection Agency (EPA) regulate the discharge of dredged or fill material into waters of the United States, including wetlands, under Sections 404 and 401 of the Federal Clean Water Act. Projects that would result in the placement of dredged or fill material into waters of the United States require a Section 404 permit from the USACOE. Some classes of fill activities may be authorized under General or Nationwide Permits if specific conditions are met. Nationwide permits do not authorize activities that are likely to jeopardize the existence of a threatened or endangered species listed or proposed for listing under the Federal Endangered Species Act. In addition to conditions outlined under each Nationwide Permit, project-specific conditions can be required by the USACOE as part of the Section 404 permitting process. When a project's activities do not meet the conditions for a Nationwide Permit, an Individual Permit may be issued.

Section 401 of the Clean Water Act requires that any person applying for a federal permit or license, which may result in a discharge of pollutants into waters of the United States, must obtain a state water quality certification that the activity complies with all applicable water quality standards, limitations, and restrictions. No license or permit may be issued by a federal agency until certification required by section 401 has been granted. Further, no license or permit may be issued if certification has been denied.

The USACOE also regulates activities in navigable waters under Section 10 of the Rivers and Harbors Act. The construction of structures, such as tidegates, bridges, or piers, or work that could interfere with navigation, including dredging or stream channelization, may require a Section 10 permit, in addition to a Section 404 permit if the activity involves the discharge of fill.

Finally, the federal government also supports a policy of minimizing "the destruction, loss, or degradation of wetlands." Executive Order 11990 (May 24, 1977) requires that each federal agency take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act or MSA) (16 U.S.C. Sections 1801-1884) of 1976, as amended in 1996 (the Sustainable Fisheries Management Act) and reauthorized in 2007, is intended to protect fisheries resources and fishing activities within 200 miles of shore. Conservation and management of U.S. fisheries, development of domestic fisheries, and phasing out of foreign fishing activities are the main objectives of the MSA. The Magnuson-Stevens Act provided NOAA Fisheries with legislative authority to regulate U.S. fisheries in the area between 3 miles and 200 miles offshore and established eight regional fishery management councils that manage the harvest of the fish and shellfish resources in these waters.

The Magnuson-Stevens Act defines "essential fish habitat" as those waters and substrate that support fish spawning, breeding, feeding, or maturation. The Magnuson-Stevens Act requires that NOAA Fisheries, the regional fishery management councils, and federal agencies that take an action that may have an effect on managed fish species under MSA, identify essential fish habitat and protect important marine and anadromous fish habitat. The regional fishery management councils, with assistance from NOAA Fisheries, are required to

develop and implement Fishery Management Plans. Fishery Management Plans delineate essential fish habitat and management goals for all managed fish species, including some fish species that are not protected under the MSA. Federal agency actions that fund, permit, or carry out activities that may adversely affect essential fish habitat are required under Section 305(b) of the MSA, in conjunction with required Section 7 consultation under FESA, to consult with NOAA Fisheries regarding potential adverse effects of their actions on essential fish habitat and to respond in writing to NOAA Fisheries' recommendations.

Monterey Bay is designated as essential fish habitat under four Fishery Management Plans. These plans provide protection for Pacific groundfish, coastal pelagics, highly migratory species, and Pacific coast salmon (i.e. Chinook salmon and Coho salmon). A total of 37 commercially important fish and shark species are managed through these four Fishery Management Plans. Within the marine study area, coastal pelagics, some groundfish species, thresher sharks, and occasionally salmon are known to be present, as discussed above in **Section 4.13.2.2.**

Rivers and Harbors Appropriations Act of 1899

Section 10 of the Federal Rivers and Harbors Appropriations Act of 1899 (RHA) (30 Stat. 1151, codified at 33 U.S.C. Sections 401, 403) prohibits the unauthorized obstruction or alteration of any navigable water (33 U.S.C. Section 403). Navigable waters under the RHA are tidally influenced waters that are presently used, have been used in the past, or could be used in the future to transport interstate or foreign commerce (33 C.F.R. Section 3294). Activities that commonly require Section 10 permits include construction of piers, wharves, bulkheads, marinas, ramps, floats, intake structures, cable and pipeline crossings, and dredging and excavation.

Marine Mammal Protection Act

The Marine Mammal Protection Act of 1972 (MMPA), as amended in 1981, 1982, 1984, and 1995, establishes a federal responsibility for the protection and conservation of marine mammal species by prohibiting the "take" of any marine mammal. The Marine Mammal Protection Act defines "take" as the act of hunting, killing, capture, and/or harassment of any marine mammal, or the attempt at such. The Act also imposes a moratorium on the import, export, or sale of any marine mammals, parts, or products within the U.S. These prohibitions apply to any person in U.S. waters and to any U.S. citizen in international waters.

The primary authority for implementing the act belongs to the USFWS and NOAA Fisheries. The USFWS is responsible for the protection of sea otters, marine otters, walruses, polar bears, three species of manatees, and dugongs. NOAA Fisheries is responsible for protecting pinnipeds (seals and sea lions) and cetaceans (whales and dolphins).

The Marine Mammal Protection Act, as amended, provides for the "incidental take" of marine mammals during marine activities (i.e. dredging, marine construction, boat racing, marine transport, recreational boating), as long as NOAA Fisheries finds the "take" would affect only a small number of individuals and would have a negligible impact on marine mammal species not listed under the FESA, would not result in the depletion of a regional population under the Marine Mammal Protection Act, and would not have an unmitigable adverse impact on subsistence harvests of these species. No permitted subsistence harvesting of whales or marine mammals occurs offshore central coastal California.

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA), enacted by Congress in 1972, is administered by NOAA's Office of Ocean and Coastal Resource Management. The CZMA provides for management of the nation's coastal resources, including the Great Lakes, and balances economic development with environmental conservation. The CZMA outlines two national programs: the National Coastal Zone Management Program and the National Estuarine Research Reserve System. Thirty-four states have approved coastal management programs. The 34 coastal programs aim to balance competing land and water issues in the coastal zone, while estuarine reserves serve as field laboratories to provide a greater understanding of estuaries and how humans impact them. The overall program objectives of CZMA remain balanced to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone."

Under Section 307 of the CZMA (16 USC § 1456), activities that may affect coastal uses or resources that are undertaken by federal agencies, require a federal license or permit, or receive federal funding must be consistent with a state's federally approved coastal management program. California's federally approved coastal management program consists of the California Coastal Act, the McAteer-Petris Act, and the Suisun Marsh Protection Act. The California Coastal Commission implements the California Coastal Act and the federal consistency provisions of the CZMA for activities affecting coastal resources outside of San Francisco Bay, including the marine study area.

Clean Water Act

The Clean Water Act (CWA) is described in **Section 4.11, Hydrology and Water Quality: Surface Water**. Under the CWA, the EPA seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters by implementing water quality regulations. **Section 4.11, Hydrology and Water Quality: Surface Water**, summarizes Sections 303(d) and 402(p) of the CWA. Section 303(d) requires states to identify impaired water bodies (i.e., 303(d) List of Impaired Water Bodies). In the marine study area, impaired water bodies that eventually drain into Monterey Bay include Elkhorn Slough, Moro Cojo Slough, Salinas Reclamation Canal, Tembladero Slough, Old Salinas River estuary, Salinas River, and Moss Landing Harbor. In addition, the nearshore waters of northern Monterey Bay are also on the 303(d) list. Section 402(p) requires National Pollutant Discharge Elimination System (NPDES) permits to control discharges of waste into waters of the United States and prevent the impairment of the receiving water for beneficial uses, which includes harm to marine biota. The *Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant* (Order No. R3-2014-0013, NPDES Permit No. CA0048551) allow MRWPCA to discharge treated wastewater from the MRWPCA Regional Wastewater Treatment Plant to Monterey Bay via the existing outfall.

National Marine Sanctuary Program Regulations

NOAA has entered into a Memorandum of Agreement with the State of California, the EPA, and the Association of Monterey Bay Area Governments regarding the MBNMS regulations relating to water quality within state waters within the sanctuary (Monterey Bay National Marine Sanctuary, 2008). With regard to permits, the MOA encompasses:

- National Pollutant Discharge Elimination System (NPDES) permits issued by the State of California under Section 13377 of the California Water Code
- Waste Discharge Requirements (WDR) issued by the State of California under Section 13263 of the California Water Code.

The MOA specifies how the review process for applications for leases, licenses, permits, approvals, or other authorizations will be administered within State waters within the MBNMS in coordination with NPDES and WDR permitting processes.

The MBNMS implements the Water Quality Protection Program for the sanctuary and tributary waters. The program is a partnership of 27 local, state, and federal government agencies (Monterey Bay National Marine Sanctuary, 2008). The program includes implementation of education, funding, monitoring, and development of treatment facilities and assessment programs to protect water quality. The goal of the program is to enhance and protect the chemical, physical, and biological integrity of the sanctuary.

4.13.3.2 State

California Endangered Species Act

Under the California Endangered Species Act, CDFW maintains lists of threatened and endangered species, candidate species, and species of special concern. Marine species that are protected by the California Endangered Species Act and have the potential to occur in the marine study area are listed in the section, above.

The California Endangered Species Act listed endangered and threatened species may not be taken or possessed at any time without a permit from CDFW (Section 3511 Birds, Section 4700 Mammals, Section 5050 Reptiles and Amphibians, and Section 5515 Fish).

Marine Life Protection Act

Within California, most of the legislative authority over fisheries management is enacted within the Marine Life Protection Act. This law directs CDFW and the Fish and Game Commission to issue sport and commercial harvesting licenses, as well as license aquaculture operations. CDFW, through the commission, is the state's lead biological resource agency and is responsible for enforcement of the state endangered species regulations and the protection and management of all state biological resources. To improve the design and management of that system, the California Fish and Game Commission, pursuant to Section 2859, adopted a Marine Life Protection program in 1999, that has all of the following goals:

1. To protect the natural diversity and abundance of marine life, and the structure, function, and integrity of marine ecosystems.
2. To help sustain, conserve, and protect marine life populations, including those of economic value, and rebuild those that are depleted.
3. To improve recreational, educational, and study opportunities provided by marine ecosystems that are subject to minimal human disturbance, and to manage these uses in a manner consistent with protecting biodiversity.
4. To protect marine natural heritage, including protection of representative and unique marine life habitats in California waters for their intrinsic value.
5. To ensure that California's Marine Protected Areas (MPAs) have clearly defined objectives, effective management measures, and adequate enforcement and are based on sound scientific guidelines.
6. To ensure that the state's MPAs are designed and managed, to the extent possible, as a network. (California Fish and Game Code Section 2853)

Section 4.11, Hydrology and Water Quality: Surface Water, discusses and presents the MPAs located in the Proposed Project area.

Ocean Plan

The Ocean Plan (Ocean Plan) is described in **Section 4.11, Hydrology and Water Quality: Surface Water**. The Ocean Plan establishes water quality objectives and beneficial uses for waters of the Pacific Ocean adjacent to the California Coast (State Water Recourse Control Board, 2012). NPDES waste discharge permits set discharge limits that are required to prevent exceedances of the water quality objectives in the Ocean Plan. The Proposed Project would discharge into Monterey Bay and therefore is subject to all Ocean Plan water quality objectives and NPDES requirements. The most relevant objectives to this project include:

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

The basis for water quality objectives established in the Ocean Plan is the protection of beneficial uses designated for each section of coastline by Regional Water Boards. The designated beneficial uses relevant to marine resources in the marine study area are as follows:

- Marine Habitat - Uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (i.e., marine mammals, shorebirds).
- Shellfish Harvesting - Uses of water that support habitats suitable for the collection of filter- feeding shellfish (i.e., clams, oysters, and mussels) for human consumption, commercial, or sport purposes. This includes waters that have in the past, or may in the future, contain significant shellfisheries.
- Commercial and Sport Fishing - Uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.
- Rare, Threatened, or Endangered Species - Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered.

For typical wastewater discharges, when released from an outfall, the wastewater and ocean water undergo rapid mixing due to the momentum and buoyancy of the discharge. The mixing occurring in the rising plume is affected by the buoyancy and momentum of the discharge, a process referred to as initial dilution. The Ocean Plan objectives are to be met after the initial dilution of the discharge into the ocean. The initial dilution occurs in an area known as the zone of initial dilution (ZID). The extent of dilution in the ZID is quantified as the minimum probable initial dilution (Dm). The water quality objectives established in the Ocean Plan are adjusted by the Dm to derive the NPDES ocean discharge limits for a wastewater discharge prior to ocean dilution.

The current MRWPCA wastewater discharge is governed by NPDES permit R3-2014-0013 issued by the Central Coast Regional Water Quality Control Board (RWQCB).

4.13.3.3 Regional and Local

Plans and Policies Consistency Analysis

Table 4.13-1 describes the state, regional, and local land use plans, policies, and regulations pertaining to marine biological resources that are relevant to the Proposed Project and that were adopted for the purpose of avoiding or mitigating an environmental effect. Also included in **Table 4.13-1** is an analysis of project consistency with these plans, policies, and regulations. In some cases, policies contain requirements that are included within enforceable regulations of the relevant jurisdiction. Where the analysis concludes the project would not conflict with the applicable plan, policy, or regulations, the finding and rationale are provided. Where the analysis concludes the project may conflict with the applicable plan, policy, or regulation, the reader is referred to **Section 4.13.4, Environmental Impacts and Mitigation Measures**, for additional discussion, including the relevant impact determination and mitigation measures.

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Table 4.13-1
Applicable State, Regional and Local Land Use Plans and Policies Relevant to Marine Biological Resources

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component	Specific Policy, or Program	Project Consistency with Policies, and Programs
CCC Original Jurisdiction	California Coastal Act	Marine Environment	Treatment Facilities at the Regional Treatment Plant (specific to the discharge of AWT Facility reverse osmosis concentrate wastewater)	**Section 30230 Marine resources; maintenance.** Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.	**Consistent**: Based on pilot testing and modeling of the proposed discharge of reverse osmosis concentrate through the MRWPCA outfall, the Proposed Project would comply with Ocean Plan regulatory requirements for concentrations at the edge of the zone of initial dilution in all scenarios; therefore the discharge wastewater would be within regulatory requirements established for protection of marine organisms. The diversion and treatment of contaminated surface waters would beneficially impact marine life. See also **Section 4.11 Hydrology and Water Quality: Surface Waters and** Impact MR-1, below. No other Proposed Project components would impact marine resources.
CCC Original Jurisdiction	California Coastal Act	Marine Environment	Treatment Facilities at the Regional Treatment Plant (specific to the discharge of AWT Facility reverse osmosis concentrate wastewater); other surface water diversions	**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 groundwater supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.	**Consistent**: Based on pilot testing and modeling of the proposed discharge of reverse osmosis concentrate through the MRWPCA outfall, the Proposed Project would comply with Ocean Plan regulatory requirements for concentrations at the edge of the zone of initial dilution in all scenarios; therefore the discharge wastewater would be within regulatory requirements established for protection of marine organisms. The diversion and treatment of contaminated surface waters would beneficially impact marine life. See also **Section 4.11 Hydrology and Water Quality: Surface Waters and** Impact MR-1, below. No other Proposed Project components would impact marine resources.
CCC Original Jurisdiction	California Coastal Act	Marine Environment	Product Water Conveyance: Coastal Alignment Monterey Pipeline	**Section 30232 Oil and hazardous substance spills**. Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.	**Consistent**: Appropriate precautions would be taken in handling any petroleum or hazardous material during construction of the pipelines in the Coastal Zone to ensure that any spills would be contained onshore in the immediate vicinity of spillage. Operation of the Treatment Facilities at the Regional Treatment Plant would be conducted in accordance with the Waste Discharge Requirements (California Regional Water Quality Control Board, 2014) such that any spills of petroleum or hazardous materials would be prevented from entering the outfall and being discharged to the bay.
CCC Original Jurisdiction	California Coastal Act	Marine Environment	Treatment Facilities at the Regional Treatment Plant (specific to the discharge of AWT Facility reverse osmosis concentrate wastewater)	**Section 30234.13 Economic, commercial, and recreational importance of fishing**. The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.	**Consistent**: The Proposed Project, including the proposed discharge of reverse osmosis concentrate through the MRWPCA outfall would not adversely impact fishing. See above.
Monterey County	North County Land Use Plan	Resource Management	Tembladero Slough Diversion Site	**Policy 2.3.2.1:** With the exception of resource dependent uses, all development, including vegetation removal, excavation, grading, filling, and the construction of roads and structures, shall be prohibited in the following environmentally sensitive habitat areas: riparian corridors, wetlands, dunes, sites of known rare and endangered species of plants and animals, rookeries, major roosting and haul out sites, and other wildlife breeding or nursery areas identified as environmentally sensitive. Resource dependent uses, including nature education and research hunting, fishing and aquaculture, where allowed by the plan, shall be allowed within environmentally sensitive habitats only if such uses will not cause significant disruption of habitat values.	The analysis of impacts on Tembladero Slough Diversions on fisheries (including anadromous fish that live in both fresh and marine environments) is addressed in **Section 4.4, Biological Resources: Fisheries.**
Monterey County	North County Land Use Plan	Resource Management	Tembladero Slough Diversion Site	**Policy 2.3.3.B6**: Dredging or other major construction activities shall be conducted so as to avoid breeding seasons and other critical phases in the life cycles of commercial species of fish and shellfish and other rare, endangered, and threatened indigenous species.	The analysis of impacts on Tembladero Slough Diversions on fisheries (including anadromous fish that live in both fresh and marine environments) is addressed in **Section 4.4, Biological Resources: Fisheries.**
Monterey County	Monterey County General Plan	Conservation and Open Space	Tembladero Slough Diversion Site Treatment Facilities at the Regional Treatment Plant RUWAP Alignment Option Coastal Alignment Option Reclamation Ditch Diversion Site Salinas Treatment Facility Blanco Drain Pump and Pipeline Diversion Site	**Policy OS-4.1:** Federal and State listed native marine and fresh water species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant shall be protected. Species designated in Area Plans shall also be protected.	**Consistent**: Based on pilot testing and modeling of the proposed discharge of reverse osmosis concentrate through the MRWPCA outfall, the Proposed Project would comply with Ocean Plan regulatory requirements for concentrations at the edge of the zone of initial dilution in all scenarios; therefore the discharge wastewater would be within regulatory requirements established for protection of marine organisms. The diversion and treatment of contaminated surface waters would beneficially impact marine life. See also **Section 4.11 Hydrology and Water Quality: Surface Waters and** Impact MR-1, below. No other Proposed Project components would impact marine resources.
City of Seaside	City of Seaside Land Use Plan	Coastal Zone	Monterey Pipeline	**Policy NCR-CZ 1.3.B: Protection of Wetlands**. The biological health and productivity of wetland areas shall be maintained, and where feasible, restored. Development that may have an adverse effect on a wetland shall not be allowed. 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	**Consistent:** The Monterey Pipeline construction would not occur in any areas inhabited by marine biological resources (more than 200 feet from the mean high tide of shoreline) and thus no direct impacts would occur due to this component. In addition, construction of the component would not have any indirect adverse impacts to marine resources. Based on pilot testing and modeling of the proposed discharge of reverse osmosis concentrate through the MRWPCA outfall, the Proposed Project would comply with Ocean Plan regulatory requirements for concentrations at the edge of the zone of initial dilution in all scenarios; therefore the discharge wastewater would be within regulatory requirements established for protection of marine organisms. The diversion and treatment of contaminated surface waters would beneficially impact

Table 4.13-1
Applicable State, Regional and Local Land Use Plans and Policies Relevant to Marine Biological Resources

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component	Specific Policy, or Program	Project Consistency with Policies, and Programs
				streams; preventing depletion of groundwater supplies; encouraging wastewater reclamation; and maintaining natural vegetation buffer areas that protect riparian habitats.	marine life. See also **Section 4.11 Hydrology and Water Quality: Surface Waters and** Impact MR-1, below. No other Proposed Project components would impact marine resources.
City of Monterey	Del Monte Beach Land Use Plan	Natural Coastal Resources	Monterey Pipeline	**Policy 4:** For any proposed development in the environmentally sensitive habitat areas of the Del Monte Beach area, as shown in, but not limited to, Figure 3A in the LCP, a resource survey shall be conducted, according to established protocols, for all sensitive species, including dune plants, snowy plover, black legless lizard, and marine mammals known to occur in the vicinity.	**Consistent:** See **Section 4.5, Biological Resources: Terrestrial.**
City of Monterey	Monterey Harbor Land Use Plan	Natural Resources	Monterey Pipeline	**Policy 3.e**: For any proposed development in the environmentally sensitive habitat areas of the Harbor LUP area, as shown in, but not limited to, Figure 2 in the LUP, a resource shall be conducted, according to established protocols, for all sensitive species, including dune plants, snowy plover, black legless lizard, and marine mammals known to occur in the vicinity.	**Consistent**: The Monterey Pipeline construction would not occur in any areas inhabited by marine biological resources (more than 200 feet from the mean high tide of shoreline) and thus no direct impacts would occur due to this component. No indirect adverse impacts to marine resources would occur due to the Proposed Project.

4.13.4 Impacts and Mitigation Measures

4.13.4.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, the project would have a significant impact on marine biological resources if it would:

a. Have a substantial adverse effect, either directly or through habitat modifications, on any *marine* species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW, USFWS, *or NOAA Fisheries*;

b. Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan governing the marine study area; or

c. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

4.13.4.2 Impact Analysis Overview

Approach to Analysis

The impact analysis in this section describes if, and to what degree, the Proposed Project would change the existing ocean conditions affecting marine biological resources described in **Section 4.13.2** and how the Proposed Project would comply, or be consistent, with the regulatory requirements described in **Section 4.13.3**. The significance of an impact is determined using the criteria identified in **Section 4.13.4.1**.

No construction activities are proposed within the marine study area. No direct construction impacts to marine resources would occur because none of the Proposed Project components involve construction within the marine study area defined above. Indirect temporary construction impacts on the marine environment relative to discharges to surface waters that may lead to the ocean are addressed in **4.10 Hydrology and Water Quality: Surface Water** and are not repeated here.

Potential adverse impacts to marine biological resources considered below are those that would result from operation of the Proposed Project Advanced Water Treatment Facility (AWT Facility), specifically discharges of reverse osmosis concentrate to Monterey Bay through the existing ocean outfall. In this analysis, the special-status species considered are those with a moderate or high probability of occurring in the marine study area.

The discharge of reverse osmosis concentrate would not involve high salinities causing toxicity or avoidance behavior on marine biological species because the concentrate would be far less saline than ambient ocean water (5,800 mg/L of total dissolved solids compared to 33,000 to 34,000 mg/L). In addition, the reverse osmosis concentrate discharge would not result in a negatively buoyant (or sinking) plume.

To determine whether impacts to marine biological impacts would be significant, this analysis is based on compliance with the Ocean Plan objectives (specifically, whether the discharge would meet quantified numeric limits in Tables 1 and 2 of the Ocean Plan).

Modeling of the Proposed Project ocean discharge was conducted by FlowScience, Inc. to determine minimum initial dilution values for the various discharge scenarios. The ocean

modeling results were used to assess compliance with the Ocean Plan. Impacts to marine biological resources arising from reverse osmosis concentrate discharge were evaluated using scientific literature, analysis described in detail in **Section 4.11, Hydrology and Water Quality: Surface Water,** and other relevant reports. The information sources included the results of source water assessments, GWR pilot plant and water quality sampling, and monitoring, ocean dilution modeling by FlowScience (November, 2014), provided in **Appendix T** and water quality quantitative analysis of the Proposed Project's ability to meet the Ocean Plan objectives by Trussell Technologies (2015a) provided in **Appendix U-1**, and described in detail in **Section 4.11 Hydrology and Water Quality: Surface Water**.[2] Potential impacts on marine birds and birds that use the marine environment are evaluated in **Section 4.5, Biological Resources: Terrestrial**.

Areas of No Impact

As discussed above, no Proposed Project construction activities would be located within the marine study area. Therefore, the Proposed Project construction would result in no direct impacts on marine biological resources in accordance with Criteria a, b, or c. The Proposed Project would not have any indirect effects on marine resources due to construction activities because regulatory programs described in **Sections 4.11, Hydrology and Water Quality: Surface Water** would prevent substantial water pollution from traveling within runoff to the marine environment. Analysis in **Section 4.12 Noise and Vibration** supports the conclusion that construction and operational noise/vibration would not result in increased ambient noise levels within the marine study area. There are no applicable local, regional, or state habitat or natural community conservation plans; the Proposed Project would result in no impacts related to Criterion b.

Summary of Impacts

Table 4.13-2 (Summary of Impacts – Marine Biological Resources) provides a summary of potential impacts to marine resources and significance determinations for each Proposed Project component.

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

Table 4.13-2
Summary of Impacts –Marine Biological Resources

Impact Title	Source Water Diversion and Storage Sites						Treatment Facilities at Regional Treatment Plant	Product Water Conveyance		Injection Well Facilities	CalAm Distribution System		Project Overall
	Salinas Pump Station	Salinas Treatment Facility Storage and Recovery	Reclamation Ditch	Tembladero Slough	Blanco Drain Diversion (Pump Station and Pipeline)	Lake El Estero		RUWAP Alignment Option	Coastal Alignment Option		Transfer Pipeline	Monterey Pipeline	
MR-1: Operational Impacts on Marine Biological Resources	BI	BI	BI	BI	BI	BI	LS	NI	NI	NI	NI	NI	LS
Cumulative Impacts	LSM: The Proposed Project would potentially result in a considerable contribution to significant cumulative impacts on marine biological resources due to the potential exceedance of the Ocean Plan water quality objectives for several constituents; however, with implementation of Mitigation Measure MR-C, the impact would be reduced to less than significant and the Proposed Project would not make a considerable contribution to a significant cumulative impact.												

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

4.13.4.3 Construction Impacts and Mitigation Measures

As discussed above in **Section 4.13.4.2**, construction of the Proposed Project would not result in substantial adverse effects on candidate, sensitive, or special-status species, would not substantially interfere with the movement of any native resident or migratory fish or wildlife species, and would not conflict with the provision of any habitat or natural community conservation plans.

4.13.4.4 Operational Impacts and Mitigation Measures

Impact MR-1: <u>Operational Impacts on Marine Biological Resources</u>. Operation of the Proposed Project would not result in substantial adverse effects on candidate, sensitive, or special-status species and would not interfere substantially with the movement of any native resident or migratory fish or wildlife species. (Criterion a) (Less than Significant)

Source Water Diversion and Storage

Section 4.10, Hydrology and Water Quality: Surface Water, provides a detailed description of pollutant load reduction benefits due to diversion of the various source waters to the Regional Treatment Plant for treatment and reuse. The Proposed Project would reduce the disposal of

those waters to the environment, including to groundwater, surface waters, and in most cases, to the Monterey Bay portion of the Pacific Ocean.

Proposed new source waters to be treated and reused include: excess municipal wastewater, agricultural wash water, southern Salinas urban runoff that currently flows to Salinas River, Reclamation Ditch water, Tembladero Slough water, Blanco Drain water, and Lake El Estero water. Each of the proposed new source waters contain varying amounts and concentrations of pollutants as characterized in **Sections 4.10 Hydrology and Water Quality: Groundwater** and **4.11 Hydrology and Water Quality: Surface Waters**.

The existing water quality conditions of the Salinas River, Reclamation Ditch and Tembladero Slough system, Blanco Drain, and Lake El Estero are provided in **Section 4.11, Hydrology and Water Quality: Surface Water**, under **Section 4.11.2.3**, Environmental Setting. Waters in these water bodies currently discharge directly or indirectly to the Monterey Bay/Pacific Ocean. Under existing conditions, agricultural wash water, after it is treated and percolated at the Salinas Treatment Facility, seeps through subsurface soils to the Salinas River, which in turn discharges to the Monterey Bay/Pacific Ocean. Pure water is evaporated from the ponds. Water with some water pollutants percolates through the shallow aquifer and ultimately to seeps to either the Salinas River (estimated to be 80% of the percolated quantity) or to the Salinas Valley Groundwater Basin (estimated to be 20% of the percolated quantity) (Todd Groundwater, 2015a).

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

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

The proposed treatment processes would destroy many of the typical pollutants through biological and chemical treatment processes, and for other pollutants, through settling or filtration out of the wastewater stream. Most of the settled and filtered pollutants would remain in sewage sludge. Sewage sludge is the solid, semisolid or liquid untreated residue generated during the treatment of domestic sewage in a treatment facility. Sewage sludge would then be dried to form biosolids. Federal and state standards and regulations ensure that biosolids are safely recycled or disposed. Local governments make the decision whether to recycle the biosolids as a fertilizer, incinerate it, or bury it in a landfill. (Source: EPA, 2014) [3] MRWPCA disposes of biosolids at the adjacent MRWMD landfill and would continue to do so if the Proposed Project is implemented. Biosolids disposal at the MRWMD landfill would not add to pollutant loads on the marine environment because the landfill is regulated to ensure that solid waste disposal does not result in contamination of water resources, including groundwater, surface water bodies like the Salinas River, and the Monterey Bay and Pacific Ocean.

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

Treatment Facilities at the Regional Treatment Plant

In producing the purified recycled water, the proposed new AWT Facility would also produce the following waste streams: biologically active filtration backwash (if included in the system),[4] membrane filtration backwash, and reverse osmosis concentrate. The biologically active filtration backwash and membrane filtration backwash would be diverted back to the Regional Treatment Plant headworks. The reverse osmosis concentrate would be piped to a proposed new brine and effluent receiving, mixing, and monitoring facility where it would be mixed, at times, with secondary effluent that is not needed for recycling and hauled brine.

The analysis of impacts of the disposal of reverse osmosis concentrate on the marine biological resources in the Monterey Bay/Pacific Ocean focuses on the water quality changes that may occur in the vicinity of the MRWPCA ocean outfall. As described in **Section 4.11, Hydrology and Water Quality: Surface Water**, FlowScience modeled dilution factors for various combinations of source water flows and ocean climatic conditions, incorporating conservative assumptions regarding the MRWPCA ocean outfall, ocean conditions, and other factors that affect the dilution of wastewater in the area near the outfall's diffuser ports (i.e., the openings in the outfall through which discharges flow out). In addition to conservative assumptions about dilution characteristics of the discharge, numerous conservative assumptions were integrated into the approach for estimating the concentrations of contaminants in the reverses osmosis concentrate to be discharged into the MRWPCA ocean outfall. Those assumptions are provided in **Appendices T,** and **U-1 and U-2**. Additional discussion of this analysis is provided in **Section 4.11.4.2** and in **Section 4.11.4.3** under **Impact HS-5**. Detailed water quality concentrations and other assumptions are provided in **Tables 4.11-18** through **4.11-21**. For each Ocean Plan constituent, Trussell Technologies conducted a blended water quality analysis of concentrations expected in the various scenarios of discharge using worst-case measured concentrations and the range of expected flow rates of each source water and measured and calculated concentrations of each type of wastewater (i.e., in the reverse osmosis concentrate, brine waste hauled to the Regional Treatment Plant for discharge, and secondary-treated effluent discharges). Using the blended water quality concentrations, the relative flow volumes (by month), and the relevant minimum dilution modeled by Flow Science, Trussell Technologies estimated the combined discharge concentrations that could occur at the edge of the zone of initial dilution (ZID) and compared those to Ocean Plan water quality objectives.

The results of the analysis are provided in **Table 4.11-20, Predicted Concentrations of Ocean Plan Constituents at the Edge of the ZID,** which shows the concentration at the edge of the ZID using the minimum initial dilution factor (D_m) values calculated by FlowScience. The resulting concentrations for each constituent in each scenario were compared to the Ocean Plan objective to assess compliance. The estimated concentrations for all five flow-scenarios are presented as concentrations at the edge of the ZID (**Table 4.11-20**) and as a percentage of the Ocean Plan objective (**Table 4.11-21, Predicted Concentrations of all Ocean Plan Constituents, Expressed as Percent of Ocean Plan Objective**). As shown, none of the constituents are expected to exceed 80% of their Ocean Plan objective. See **Section 4.11, Hydrology and Water Quality: Surface Water,** and **Appendices U-1 and U-2**.

[4] If other subsequent water quality analyses and/or the implementation of other treatment or dilution measures do not reduce cumulative marine water quality and biological impacts to a less than significant level, Mitigation measure HS-C in **Section 4.11, Hydrology and Water Quality: Surface Water**, of this EIR would require that this optional treatment process be required.

MRWPCA's consultant team conducted toxicity testing of the GWR pilot plant's reverse osmosis concentrate to estimate the ability of the GWR concentrate to meet Ocean Plan objectives for toxicity to marine species (Trussell Technologies, 2015a). On April 9, 2014, a sample of reverse osmosis concentrate was sent to Pacific EcoRisk for acute and chronic toxicity analysis. Based on these results (reverse osmosis concentrate values presented in **Table 4.11-20**), the Proposed Project concentrate would require a minimum D_m of 16:1 and 99:1 for acute and chronic toxicity, respectively, to meet the Ocean Plan objectives. These D_m values were compared to predicted D_m values for the discharge of the Proposed Project's reverse osmosis concentrate from the Proposed Project's full-scale AWT Facility and the discharge of concentrate combined with secondary effluent from the Regional Treatment Plant. The minimum dilution modeled for the various Proposed Project discharge scenarios was 137:1, which is when the secondary effluent discharge is at the maximum possible flow under the current port configuration as shown in **Appendix T** (FlowScience, 2014b).[5] Given that the lowest expected D_m value for the various Proposed Project ocean discharge scenarios is greater than the required dilution factor for compliance with the Ocean Plan toxicity objectives, this analysis for toxicity illustrates that the Proposed Project discharge would be expected to comply with Ocean Plan objectives related to toxicity even if the Regional Treatment Plant influents were to vary as proposed compared to those that occurred during GWR pilot plant testing in 2014. The Proposed Project would have a less-than-significant impact related to toxicity of ocean discharges on marine resources.

The Proposed Project would also reduce pollutant loads to the marine environment due to diversions of surface waters (or waters that are disposed directly or indirectly to surface waters) and that currently flow to the Monterey Bay. The quantitative analysis of these beneficial impacts is provided in detail in **Section 4.11, Hydrology and Water Quality: Surface Water**. Any amount of reduction in pollutant loads on the ocean would result in a benefit to all marine biological resources due to reductions in exposure of marine biological species to pollutants.

Impact Conclusion

Trussell Technologies used a conservative approach to estimate the water qualities of the Regional Treatment Plant secondary effluent, reverse osmosis concentrate, and hauled brine waste under anticipated worst-case scenario and conditions. These water quality data were then combined for various discharge scenarios, and a concentration at the edge of the ZID was calculated for each constituent and scenario. Based on the data, assumptions, modeling, and analytical methodology presented in Trussell Technologies technical memorandum, the Proposed Project would comply with the Ocean Plan objectives, including toxicity of the discharges. The Proposed Project would have a less than significant impact related to toxicity of ocean discharges on marine resources.

[5] The MRWPCA's current NPDES ocean discharge permit includes daily maximum effluent limitations for acute and chronic toxicity to marine species that are based on the current allowable Dm of 145. The acute toxicity effluent limitation is 4.7 TUa (acute toxicity units) and the chronic toxicity effluent limitation is 150 TUc (chronic toxicity units). The permit requires that toxicity testing be conducted twice per year, with one sample collected during the wet season when the discharge is primarily secondary effluent and once during the dry season when the discharge is primarily trucked brine waste. The MRWPCA ocean discharge has consistently complied with these toxicity limits (CCRWQCB, 2014).

4.13.4.5 Cumulative Impacts and Mitigation Measures

The geographic scope for cumulative impact analysis on marine biological resources includes the area near the MRWPCA ocean outfall diffusers (the marine study area shown in **Figure 4.13-1**). Based on the list of cumulative projects provided on **Table 4.1-2, Project Considered for Cumulative Analysis (listed by primary geographic area in which project is located)** (see **Section 4.1, Introduction**), no cumulative projects have been identified that would result in impacts to this area, except for the Monterey Peninsula Water Supply Project's (MPWSP) (with the 6.4-mgd Desalination Plant) (also referred to as the CalAm facilities of the MPWSP Variant).[6] The discussion of cumulative impacts is organized to address the combined impacts of the Proposed Project plus the MPWSP (with the 6.4 mgd Desalination Plant) and then to address the overall combined impacts of the Proposed Project and all relevant past, present and probable future projects:

- *Combined Impacts of Proposed Project Plus MPWSP (with 6.4-mgd Desalination Plant) (referred to as the MPWSP Variant)*:[7] The CalAm MPWSP includes a seawater intake system; a source water pipeline; a desalination plant and appurtenant facilities; desalinated water conveyance facilities, including pipelines, pump stations, a terminal reservoir; and an expanded ASR system, including two additional injection/extraction wells (ASR-5 and ASR-6 Wells), a new ASR Pump Station, and conveyance pipelines. The CalAm Distribution Pipelines (Transfer and Monterey) would be constructed for either the MPWSP or GWR projects, but not for both if they are both implemented. The cumulative impact analysis in this EIR anticipates that the Proposed Project could be implemented with a version of the MPWSP that includes a 6.4 mgd desalination plant. Similarly, the MPWSP EIR is evaluating a "Variant" project that includes the proposed CalAm Facilities (with the 6.4 mgd desalination plant) and the Proposed Project. The impacts of the Variant are considered to be cumulative impacts in this EIR. The CalAm and GWR Facilities that comprise the MPWSP Variant are shown in **Appendix Y**.
- *Overall Cumulative Projects*: This impact analysis is based on the list of cumulative projects provided on **Table 4.1-2** (see **Section 4.1**). The overall cumulative impacts analysis considers the degree to which all relevant past, present and probable future projects (including the MPWSP (with the 6.4 mgd desalination plant)) could result in impacts that combine with the impacts of the Proposed Project.

The only other projects that may add with the Proposed Project's marine biological resources impacts would be projects that would also change the ocean environment in the immediate vicinity of the outfall. As documented above, the Proposed Project ocean discharges would

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

[7] The October 2012 Notice of Preparation of an EIR for the MPWSP describes an alternative to the MPWSP that would include a smaller desalination plant combined with the Proposed GWR Project (CPUC 2012). Based on ongoing coordination with the CPUC's EIR consultants, this alternative is referenced as the "Variant" and includes a 6.4 mgd desalination plant that was proposed by CalAm in amended application materials, submitted in 2013 to the CPUC (CPUC, 2013).

meet all Ocean Plan objectives (i.e., concentrations of the constituents in the ocean at the edge of the zone of initial dilution would be less than the Ocean Plan objectives) and thus, would have a less-than-significant impact on marine biological resources.

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

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

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

Specifically, three types of exceedances were identified:

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

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

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

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

The Proposed Project would contribute to the significant cumulative impact pertaining to the discharge of ammonia. The exceedance would be a result of the combination of ammonia present in the secondary effluent and GWR concentrate combined with high salinity of the desalination brine[8]. Ammonia is not expected to exceed the Ocean Plan objective when the discharge consists of secondary effluent and/or GWR reverse osmosis concentration without desalination brine, or when the desalination brine is combined with approximately 6 mgd or more of secondary effluent, because in these cases there would be sufficient mixing in the ZID to adequately dilute the discharge. Similarly, no exceedance is expected when the discharge contains desalination brine with less than approximately 3 mgd of secondary effluent flow and no GWR reverse osmosis concentrate, due to the lower ammonia loading. This potential ammonia exceedance would occur for the MPSWP when desalination brine is combined with 3 to 6 mgd of secondary effluent or when combined with GWR reverse osmosis concentrate and 6 mgd or less of secondary effluent. The largest potential exceedance of ammonia is expected at times when the combined discharge consists of desalination brine and GWR reverse osmosis concentrate with no secondary effluent flow.

The Proposed Project also would contribute to a significant cumulative impact pertaining to the discharge of chlordane, DDT, and TCDD equivalents to a similar degree as it does to ammonia, where the exceedance would be a result of constituents in the secondary effluent and ocean water and inadequate dilution in the ZID due to the density of the desalination brine. Because these constituents would potentially not meet the Ocean Plan water quality objectives at the edge of the ZID in some combined discharge conditions, the Proposed Project would have a considerable contribution to a significant cumulative marine biological resources impact. Implementation of Mitigation Measure HS-C (provided in **Section 4.11, Hydrology and Water Quality: Surface Water**) would be required to reduce the cumulative impact to a less than significant level.

Cumulative Impact Conclusion

The marine water quality/biological resources impact has been studied for multiple discharge scenarios resulting from the operation of the GWR Project and the MPWSP with the 6.4 mgd desalination plant. The water quality analysis used the best available information and the impact conclusion is based on modeled constituents in the discharge streams and water quality data collected from Monterey Bay under CCLEAN to represent source water entering the MPWSP Desalination Plant. **Table 4.13-3** summarizes the exceedances of water quality objectives for constituents at the edge of the ZID from combined discharges

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

composed of brine from the MPWPS with 6.4 mgd desalination project, GWR concentrate, and secondary effluent:

Table 4.13-3
Potential Water Quality Objectives Exceedances at the Edge of the ZID

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

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

Based on the water quality analyses, the desalination brine-only, desalination brine-and- secondary effluent (at 3 to 6 mgd of flow), and blended discharges (with less than 14 mgd of secondary effluent) would result in a significant impact to marine water quality, which would be reduced to less-than-significant level through implementation of **Mitigation Measure HS-C / MR-SC (see Section 4.11, Hydrology and Water Quality: Surface Water at page 4.11-100)**. The mitigation would involve employing one or more of the design features and/or operational measures listed below prior to operating the MPWSP desalination plant. The design features and operational measures include short-term storage and release of brine from the MPWSP desalination plant, treatment of the MPWSP source water and/or brine discharge(s), and biologically active filtration at the Regional Treatment Plant. These operational changes or measures along

with the additional analysis of the constituents in MPWSP source waters would be incorporated into the NPDES permit issued by the Regional Water Quality Control Board as part of the process of amending the MRWPCA NPDES Permit (R3-2014-0013). The Proposed GWR Project when implemented in combination with the MPWSP with 6.4 mgd desalination plant would result in a less-than-significant cumulative impact to marine water quality and marine biological resources with implementation of Mitigation Measure MR-C (that requires implementation of Mitigation Measure HS-C in **Section 4.11.4)**.

Mitigation Measure

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

Implement Mitigation Measure HS-C.

Effects of Implementation of Mitigation Measure HS-C

Consistent with the discussion of Mitigation Measure HS-C in Section 4.11.4, implementation of MR-C would result in the same potential secondary effects as described in Section 4.11.4 on page 4.11-101.

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

As discussed previously, the Proposed Project would also reduce pollutant loads to the marine environment due to diversion and treatment of surface waters (or waters that are disposed directly or indirectly to surface waters) that currently flow to the Monterey Bay. The quantitative analysis of these beneficial impacts is provided in detail in **Section 4.11, Hydrology and Water Quality: Surface Water**. Any amount of reduction in pollutant loads on the ocean would result in a benefit to marine biological resources due to reductions in exposure of marine biological species to pollutants. Thus, if you consider a larger geographic area of the marine environment than only the immediate vicinity of the ocean outfall, the Proposed Project would result in beneficial cumulative impacts.

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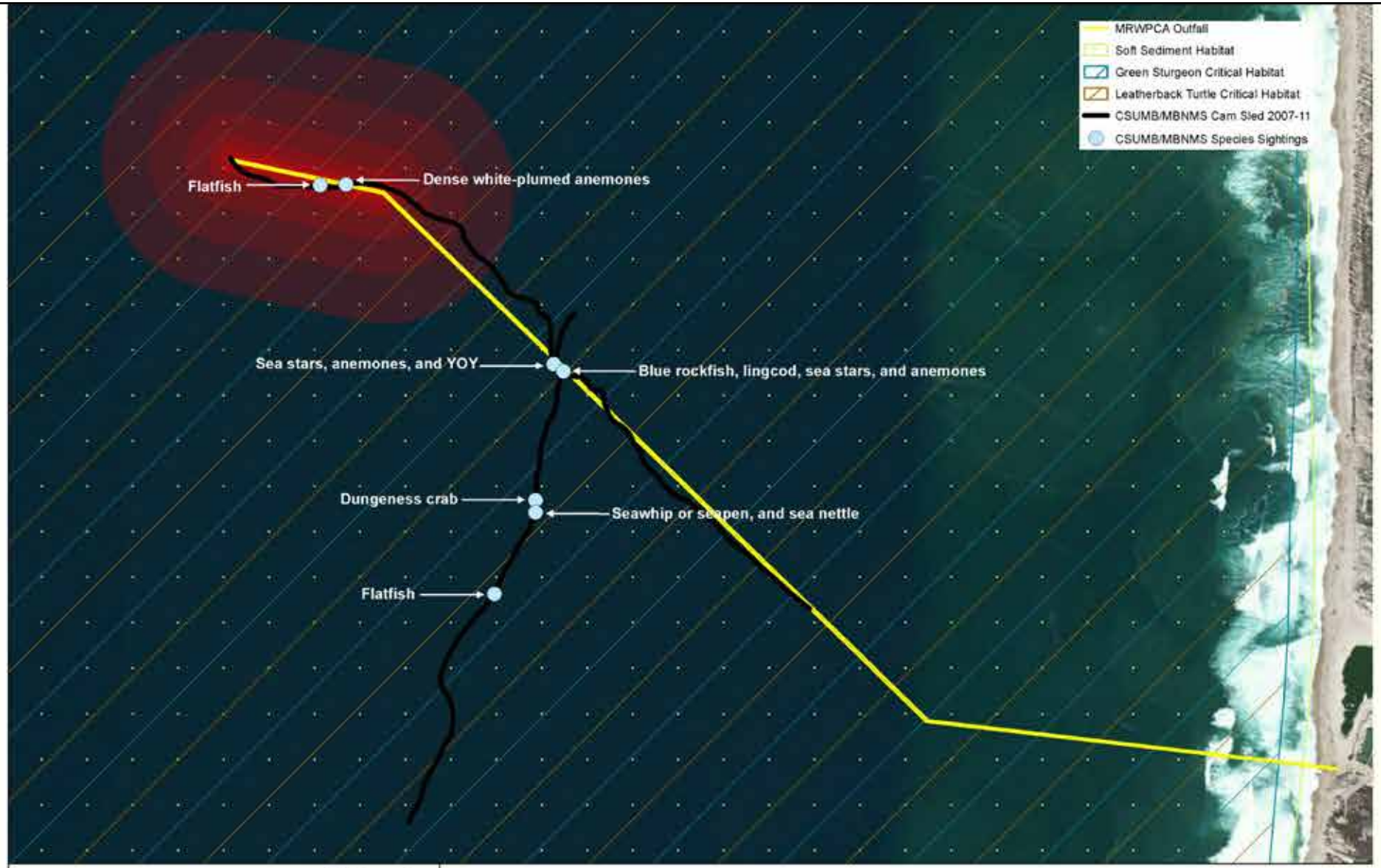

Source: SWCA, 2014

Existing Marine Biological Resources Study Area

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
4.13-1

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