4.9 Hydrology and Water Quality

This section addresses the potential impacts to hydrology and water quality in connection with the Proposed Project. In addition to potential impacts, this section identifies mitigation measures that can reduce potentially significant hydrology and water quality impacts.

4.9.1 Environmental Setting

4.9.1.1 Proposed Oil Project Site Topography and Drainage

The Proposed Oil Project Site is located approximately 0.4 mile inland from Santa Monica Bay, within an established urban area, at an elevation of approximately 55 feet above mean sea level. The Project Site is fully developed with two large buildings and surface asphalt or concrete paving throughout, with the exception of a small area along the west side, where there is a slight unpaved embankment. In addition, the majority of land surrounding the Project Site is also developed.

The general topography of the Proposed Oil Project Site is gently sloping toward the west; however, a small portion of the Proposed Oil Project Site drains to the east toward Valley Drive. Onsite drainage flows as sheetflow across mostly paved surfaces, away from a slight knoll located in the southeast portion of the site. Two drainage sumps are located onsite, including a sump drain in the entry driveway and a sump drain at the base of a ramp drive in the lower level of the building. The outlet of the latter sump drain is unclear. However, the sump drain within the driveway, as well as all other site runoff, flows into the Los Angeles County Flood Control District storm drain system before ultimately discharging into the Pacific Ocean, at an outfall at the end of Herondo Street. A portion of the runoff from the Herondo Street storm drain is diverted to the sanitary sewer system prior to ocean outflow, thus reducing discharge of poor water quality from the storm drain (E&B Natural Resources 2012).

4.9.1.2 Existing City Maintenance Yard Topography and Drainage

The Proposed City Maintenance Yard Project Site is gently to moderately sloped, with a 20 foot elevation difference across the site, from east to west. Surface runoff occurs as sheetflow toward and existing storm drain inlet and the Pacific Ocean. The property is fully developed and is similarly surrounded by urban development.

4.9.1.3 Pipeline Route Topography and Drainage

Beginning at the Project Site, the Proposed Pipeline route trends southerly along Valley Drive, across relatively flat-lying topography. The Pipeline then trends easterly up gently to moderately sloping topography, with an elevation gain of approximately 45 feet, at which point the topography is relatively flat to the Exxon Mobile Refinery. Rainwater runoff along the Pipeline

route is primarily by surface sheet flow across the paved surfaces, toward the west. The surface runoff flows into storm drains, which empty into the Pacific Ocean.

4.9.1.4 Surface Water and Hydrology

There are no rivers or streams through the Proposed Project area. The Proposed Project is located within the Los Angeles-San Gabriel Hydrologic Unit (HU) and in the West Coast Hydrologic Sub Area (HAS); as defined by the Water Quality Control Plan or the "Basin Plan" (California Regional Water Quality Control Board, 1994).

A hydrology study of the Proposed Oil Project area was conducted in 2012 (E&B Natural Resources, 2012) and corroborated by the EIR preparers. The study determined that there is no existing runoff onto the Project Site from offsite sources. The majority of the current runoff occurring on the site is by sheet flow. The total discharge from the Project Site during a 100-year frequency storm was determined to be 3.93 cubic feet per second, representing a 24-hour volume of 0.54 acre-feet, or 23,522 cubic feet.

Based on the Federal Emergency Management Agency (FEMA) Flood Rate Insurance Map for the Proposed Project area, the elevation of the Project Site, the Proposed City Maintenance Yard Project Site, and the Proposed Pipeline route are above the 500-year flood elevation. Because the Proposed Project Sites are located above the 500-year flood level, the sites are similarly not within the 100-year flood plain (Figure 4.9-1).

Offshore marine waters are a part of Santa Monica Bay, which generally extends south from Pointe Dume, in Malibu, to the Palos Verdes Peninsula. Prior to 1825, the primary drainage flowing into the bay was the Los Angeles River. However, a catastrophic flood event in 1825 diverted the Los Angeles River south of the Palos Verdes Peninsula. Ballona Creek, an ancestral remnant of the Los Angeles River, is now the primary drainage feeding into the bay. Other waterways draining into the bay include Malibu Creek and Topanga Creek.

Figure 4.9-1 Flood Insurance Rate Map (FIRM) for the Proposed Project Area

Source: Federal Emergency Management Agency, National Flood Hazards Layer, 2012

4.9.1.5 Groundwater

The natural groundwater reservoirs beneath Los Angeles County consist of groundwater basins that are grouped together under five major geographic areas (California Regional Water Quality Control Board 1994). The Proposed Project Sites are located along the westerly edge of the West Coast Basin, west of a series of injection wells that serve as the West Coast Groundwater Barrier Project (Figure 4.9-2). The Barrier Project prevents seawater intrusion into the fresh groundwater supplies of the West Coast Basin, which is one of the largest basins of the Coastal Plain groundwater basins. Two million residents of the Coastal Plain depend on groundwater that is protected by the barrier facilities, for approximately 35 percent of their potable water supply.

Groundwater beneath the Project area is not locally used for potable water, as this area lies west of the West Coast Groundwater Barrier, which prevents seawater intrusion into the fresh groundwater supplies of the West Coast Basin. However, the portion of the West Coast Basin underlain by the Project Site and proposed pipelines is protected by the California Regional Water Quality Control Board (RWQCB) as a beneficial water source with respect to municipal and domestic supply, industrial service supply, industrial process supply, and agricultural supply (RWQCB 1995).

Potable water is provided to the City by the California Water Service Company (Cal Water), which derives its water supply from a variety of sources throughout California. In order to offset the demand for potable water, reclaimed water supply to the City of Hermosa Beach is served by the West Basin Municipal Water District (West Basin), which provides drinking water and recycled water to a 185-square mile service area. See Section 4.14, Water Resources, for additional information pertaining to water purveyors for the City.

The West Coast Basin is bounded on the west and south by the Pacific Ocean, on the north by the Ballona Escarpment, and on the east by the Newport-Inglewood Uplift. This fault forms a natural barrier to restrict groundwater flows from the adjacent Central Basin. Three major fresh water aquifers comprise the West Coast Basin, including the 200-Foot Sand (Gage), the Silverado, and the Lower San Pedro and Pico aquifers. Aquifers in the West Coast Basin are generally confined and receive the majority of their natural recharge from adjacent groundwater basins underflow and from the Pacific Ocean (seawater intrusion). Aquifer depths can reach more than 1,500 feet in the West Coast Basin, although production water wells generally do not need to be drilled this deep to tap sufficient water.

Groundwater beneath the Project Site was encountered in borings, at depths between 48 and 49 feet below ground surface (NMG Geotechnical 2012), which is equivalent to elevations of approximately 4 to 5 feet above mean sea level.

Figure 4.9-2 Location of Barrier Injection Wells in the Proposed Project Area

Source: E&B Natural Resources Management Corporation 2012

4.9.1.6 Water Quality

Surface Water

The Project Site is currently used as the City Public Works Maintenance Yard. Existing development consists of three buildings, two trailers, storage containers, sheds, trash bins, a propane tank, and a 15-space parking area. Incidental spills of petroleum products and hazardous materials would be expected at such a facility, which includes vehicle maintenance, washing, and storage of small quantities of petroleum products and hazardous materials related to maintenance. As previously stated, at least one of two on-site drainage sumps flow into the storm drain system before ultimately discharging into the Pacific Ocean, at an outfall at the end of Herondo Street. A portion of the runoff from the Herondo Street storm drain is diverted to the sanitary sewer system prior to ocean outflow, thus reducing discharge of poor water quality from the storm drain.

With respect to marine waters located near the Project Site, the State Water Resources Control Board (SWRCB) adopted the Water Quality Control Plan for Ocean Waters of California, also known as the Ocean Plan (SWRCB 2012). This plan requires that wastes be discharged a sufficient distance away from Areas of Special Biological Significance (ASBS) to protect natural water quality conditions. The coastal area adjacent to the Project Site is not considered an ASBS. However, the SWRCB may require that site-specific objectives be established for the

adjacent coastal waters. Beneficial uses of marine waters adjacent to the Project Site include contact recreation, marine habitat, wildlife habitat, commercial and sport fishing, and shellfish harvesting Regulations (RWQCB 1995).

Groundwater

Groundwater underlying the Project Site has been impacted by petroleum hydrocarbons, lead, barium, and arsenic. Ten of 73 groundwater samples collected from the Site exceeded Regional Water Quality Control Board guidelines for total petroleum hydrocarbons. Volatile organic compounds were not present in any of the samples at concentrations above the EPA Region 9 Industrial Regional Screening Levels. However, six of the samples exceeded the EPA Region 9 Industrial Regional Screening levels for lead.

The Basin Plan identifies water quality objectives and beneficial uses of groundwater for the West Coast Basin. The designated beneficial uses for groundwater within the West Coast Basin include: municipal, agriculture, industrial, process supply, and industrial service supply. The water quality objectives for the West Coast Basin include: 800 mg/L total dissolved solids, 250 mg/L sulfate, 250 mg/L chloride, 1.5 mg/L boron, 45 mg/L nitrate, and 110 mg/L bacteria. In addition, groundwater shall not contain concentrations of chemical constituents in amounts that adversely affect water quality or contain taste or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. Groundwater shall not contain concentrations of radioactive substances in excess of the limits specified in Table 4 of Section 64443 (Radioactivity) of Title 22 of the California Code of Regulations (RWQCB 1995).

4.9.1.7 Natural Oil Seeps

Natural oil seeps have been active offshore southern California, including Santa Monica Bay, throughout recorded history and those seeps are currently widespread. Seep hydrocarbons are released gradually throughout the marine environment, including sea floor, water column, sea surface, and shoreline. One of the more active and better known seeps in Santa Monica Bay is the Redondo seep, located near the center of the offshore Redondo Submarine Canyon. These seeps, which remain active and occur along a seaward extension of the Palos Verdes Hills Fault, are the most active seeps south of Coal Oil Point, located in the Santa Barbara Channel. Six separate seeps are located along the Palos Verdes Fault, with the closest seep to the beach being two miles off Redondo Beach, located near the head of the Redondo Submarine Canyon, in a water depth of approximately 800 feet. Five additional seeps occur along the Palos Verdes Fault, including the Manhattan seeps, located four to five miles off Manhattan Beach, and the Venice seeps, located approximately eight miles off Venice Beach. Seep activity is variable, with some seeps remaining dormant for extended periods of time. Samples of beach tar collected in 1971/1972, from El Segundo to Redondo Beach, indicated that 86 percent of the samples contained oil that originated from natural seeps offshore (Wilkinson 1972).

The volume of oil produced by an individual seep during a given time is difficult to determine under ideal conditions, but since most seeps apparently occur as seep areas that include a multitude of small individual seeps, the calculation of total volume released is extremely difficult (Wilkinson 1972). Natural oil seeps occur extensively in offshore waters along the Santa

Barbara coast. Up to 2,000 natural seeps have been documented from Point Conception to Rincon Point. Seepage rates, most notably in the vicinity of Coal Oil Point, near Santa Barbara, are estimated up to 190 barrels of oil per day, or 7,800 to 8,900 metric tons per year. Seepage rates for the entire Santa Barbara Channel are estimated up to 35,000 metric tons per year. In contrast, in Santa Monica Bay, seep estimates range from 100 to 1,000 metric tons per year (Kvenvolden and Cooper 2003; County of Santa Barbara Energy Division 2002; Quigley et al. 1999). The Manhattan Beach and Redondo Beach seeps have been estimated to average about 10 barrels of oil per day (about 500 metric tons per year)(Ocean Conservation Society 2011).

Rates and patterns of seepage are variable. Seeps have been observed to stop, start, grow, shrink, or migrate, over both the short-term and long-term. Seepage rates have been shown to vary with the tides, being greatest at low tide, and some changes reflect natural alterations beneath the sea floor, such as opening or obstruction of seepage paths. Other changes may be due to offshore oil production. Several investigations have inferred that withdrawal of oil from the reservoirs near Platform Holly (about two miles southwest of Coal Oil Point) is responsible for decreases in seep activity by more than 50 percent over a 22 year period. Oil production from the Monterey Formation oil and gas reservoirs caused subsequent declines in reservoir pressure, thus removing the primary mechanisms of the seepage. This implies that worldwide oil production may lead to declines in natural emissions of hydrocarbons on a global scale (County of Santa Barbara Energy Division 2002; Quigley et al. 1999).

Sampling and geochemical analysis of beach tar balls and oil from offshore drilling platforms have been completed along the coast from Santa Barbara north to Point Sal (Lorenson, et al., 2004, 2009). Platform oils sampled included Platform Holly, located near Santa Barbara, and platforms located near Point Conception, including Harvest, Hermosa, Hidalgo, Harmony, Platform A, Hilda, and Irene. It was found that it was difficult to conclusively differentiate beach samples collected from natural seepage from Platform Holly oils, which have biomarker parameters that are similar to seep oils, due to the lack of biodegradation of the seep samples as a result of proximity of the platform and seep samples. In contrast, seep samples collected on beaches closer to Point Conception have been exposed to significant biodegradation while in the subsurface. The majority of seep tars sampled on beaches in proximity to the platforms near Point Conception have been biodegraded such that these samples are distinguishable from the platform samples, based on chemometric fingerprinting.

4.9.2 Regulatory Setting

4.9.2.1 Federal Regulations and Policies

The Clean Water Act

The Clean Water Act establishes the basic structure for regulating discharges of pollutants into waters of the United States and establishes regional quality standards for surface waters. Under the Clean Water Act, the EPA has implemented pollution control standards for industries, as well as water quality standards for all contaminants in surface waters. The Clean Water Act made it unlawful to discharge any pollutant from a point source into navigable water unless a National Pollution Discharge Elimination System (NPDES) permit is obtained from the EPA. Each

NPDES permit specifies effluent limitation for particular pollutants, as well as monitoring and reporting requirements for the proposed discharge. The implementation of permit issuance, receipt of monitoring data submitted by permittees, compliance monitoring, and enforcement has been granted to the states.

Total Maximum Daily Loads

Section 303 of the Clean Water Act requires states to develop lists of impaired waters, being waters that are too polluted or otherwise degraded to meet the water quality standards. States must develop Total Maximum Daily Loads, or TMDL, for these waters. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards. States must develop TMDL plans to determine how to reduce pollution from point sources and non-point sources, so that pollutant loads stay below the maximum specified in the TMDL. States are required to prioritize waters/watersheds for TMDL development, compile this information in a list and submit the list to the EPA for review and approval. This list is known as the 303 (d) list of impaired waters. Santa Monica Bay is listed on the California 303(d) list as impaired for human body contact recreation, due to high concentrations of bacteria, for dichloro-diphenyl-trichloroethane (DDT) and polychlorinated biphenyls (PCBs), and for nearshore and offshore debris.

The Los Angeles Regional Water Quality Control Board (RWQCB) established the Santa Monica Bay Beaches Bacterial (SMBBB) TMDLs, for both dry and wet weather. The City of Hermosa Beach is located within Jurisdiction 5 of the SMBBB TMDL monitoring program, which covers the Hermosa sub-watershed, as defined by the RWQCB (Technical Steering Committee, City of Los Angeles and County of Los Angeles 2004).

Safe Drinking Water Act of 1974

The Safe Drinking Water Act of 1974 (SDWA) was implemented by the EPA. It is the primary federal regulation controlling drinking water quality in every public water system in the United States.

The SDWA authorizes the EPA to establish and enforce guidelines for drinking water, in order to protect water supplies from both naturally occurring and manmade contaminants. Significant amendments to the SDWA were promulgated in 1986 and 1996. Standards for treatment of individual contaminants, including pesticides, trihalomethanes, arsenic, selenium, radionuclides, nitrates, toxic metals, bacterial viruses, and pathogens, were set in the original SDWA. The amendments to the SDWA made significant changes, most of which resulted in more stringent protection of drinking water sources. The amended SDWA also greatly enhances the existing law by implementing operator training, funding for water system improvements, and public information as important components of establishing safe drinking water.

Oil Pollution Act

The Oil Pollution Act of 1990 established a single uniform Federal system of liability and compensation for damages caused by oil spills in U.S. navigable waters. The Act requires removal of spilled oil and establishes a national system of planning for and responding to oil spill incidents, including provisions to:

- Improve oil-spill prevention, preparedness, and response capabilities;
- Establish limitations on liabilities for damage resulting from oil pollution;
- Provide funding for natural resource damage assessments;
- Implement a fund for payment of compensation for such damages; and
- Establish an oil pollution research and development program.

4.9.2.2 State Policies and Regulations

State Water Resources Control Board

The State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards are the principal state agencies with responsibility for the coordination and control of water quality. The SWRCB enforces the water quality standards set forth in the Clean Water Act for the State of California on behalf of the Federal EPA. Most SWRCB objectives are based on California Code of Regulations, Title 22 - State Drinking Water Standards. The City of Hermosa Beach lies within Region 4, the Los Angeles Regional Water Quality Control Board. The SWRCB has elected to adopt a Statewide General Permit serving as an NPDES permit, in compliance with CWQ Section 402, to regulate discharge. The General Permit Order 2012-0006-DWQ, regulates discharges of storm water associated with construction sites. The general permit authorizes discharges of storm water and non-storm water associated with the construction activity so long as the discharges comply with the requirements and provisions in the permit.

An industrial NPDES permit is not applicable to the Project, as all runoff and excess fluids generated onsite will be collected and disposed in onsite injection wells.

The Porter-Cologne Water Quality Control Act

Since 1973, the California State Water Resources Control Board and its nine Regional Water Quality Control Boards were delegated the responsibility of administering permitted discharge into the Waters of California. The Porter-Cologne Water Quality Control Act provides a comprehensive water quality management system for the protection of California waters and regulates the discharge of oil into navigable waters by imposing civil penalties and damages for negligent or intentional oil spills. Under this Act, "any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the water of the state" must file a report of the discharge with the appropriate Regional Water Quality Control Board. Pursuant to the Act, the Regional Board may then prescribe "waste discharge requirements" that add conditions related to control of that discharge. Porter-Cologne defines "waste" broadly and the term has been applied to a diverse array of materials, including non-point source pollution.

When regulating discharges that are included in the Federal Clean Water Act, the State essentially treats waste discharge requirements and NPDES as a single permitting vehicle. The Porter-Cologne Water Quality Control Act is primarily a state regulation addressing water quality and waste discharge on land. Permitted discharges must be in compliance with the Basin Plan that was developed by the Los Angeles Regional Water Quality Control Board for Region 4, which includes Los Angeles County and the City of Hermosa Beach, including the Proposed

Project. Each Regional Board implements a Basin Plan to ensure that projects consider regional beneficial uses, water quality objectives, and water quality problems.

The Los Angeles Regional Water Quality Control Board regulates urban runoff discharges under NPDES permit regulations. NPDES permitting requirements cover runoff discharged from point sources, such as industrial outfall discharges, and non-point sources, including storm water runoff. The Los Angeles Regional Water Quality Control Board implements the NPDES program by issuing construction, operational, and industrial discharge permits. Regulatory authority of the NPDES permitting process is typically overseen by local jurisdictions, such as the City of Hermosa Beach.

As a part of the NPDES permit, a Storm Water Pollution Prevention Plan (SWPPP) must be prepared, including Best Management Practices (BMPs), which are required as part of the SWPPP. The EPA defines Best Management Practices as "schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of the Water of the United States." Best Management Practices include treatment requirements, "operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage". (20 CFR 122.2)

California Coastal Act (PRC 30000 et seq.)

The California Coastal Act is the principal planning and regulatory program for the coastal zone of California. It governs a variety of actions and activities that affect the shoreline throughout the state. Specifically, the Act protects coastal access, environmentally sensitive habitats, agricultural lands, fisheries, cultural resources, and scenic qualities of the shoreline. The Act also establishes guidelines for development in the coastal zone and contains provisions for protecting life and property from coastal hazards. It is implemented through Local Coastal Programs that are developed and adopted by county and city jurisdictions, as well as other state agencies that own land in the coastal zone. The Act also addresses surface waters, flood hazards and disturbances, maintenance of biological productivity in surface waters, and potential impacts from runoff.

California Toxics Rule (40 CFR Part 131)

Under Section 303(c)(2)(B) of the Clean Water Act, states must adopt numeric criteria for the priority toxic pollutants listed under Section 307(a) if those pollutants could be reasonably expected to interfere with the designated uses of States' waters. Therefore, the U.S. Environmental Protection Agency promulgated numeric water quality criteria for priority toxic pollutants and other water quality standards provisions to be applied to waters in the State of California. This rule satisfies Clean Water Act requirements and fills the need for water quality standards for priority toxic pollutants to protect public health and the environment. The State Water Resources Control Board adopted the "Policy for implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California" in 2000.

Disposal of Exploration and Production (E&P) Waste (CFR, Title 40, Section 261.4(b)(5) and CCR, Title 22, Sections 66261.4(b)(2) and 66261.24(a)(1))

Exploration and Production (E&P) waste intrinsic to oil production, including but not limited to drilling muds, oily wastes, and brines, are managed as nonhazardous solid wastes under Federal

law, pursuant to an E&P exemption. This exemption applies in California if the waste displays the toxicity characteristics for hazardous waste based solely on the Toxicity Characteristic Leaching Procedure (TCLP). Some E&P wastes that are not intrinsic to oil production may exhibit California hazardous waste characteristics not covered under the Federal exemption and should be managed as hazardous wastes under State law. Guidance is given to the generators to properly characterize E&P wastes and dispose of those wastes in accordance with all applicable State and Federal laws and regulations. The Federal exemption of E&P wastes from regulation as hazardous wastes is commonly known as the E&P exemption.

Class II Injection Wells

The U.S. EPA and the California Department of Conservation, Division of Oil and Gas and Geothermal Resources (DOGGR) have jurisdiction over Class II underground injection in California. In March 1983, DOGGR received primacy from the U.S. EPA to administer the federal Underground Injection Control (UIC) Program for Class II wells in California, under provisions of the state Public Resources Code and the federal Safe Drinking Water Act. The primary features of the UIC Program include permitting, inspection, enforcement, mechanical integrity testing, plugging and abandonment oversight, data management, and public outreach.

Safe Drinking Water and Toxic Enforcement Act

The Safe Drinking Water and Toxic Enforcement Act provides two ways to administratively list chemicals known to the State to cause cancer or reproductive toxicity. A chemical can be listed if a body considered being authoritative by the State's qualified experts, such as the EPA or Food and Drug Administration (FDA), formally identifies the chemical as causing cancer or reproductive toxicity. The criteria for listing these chemicals are outlined in 22 Code of Federal Regulations, Section 12902.

4.9.2.3 Local Policies and Regulations

Standard Urban Stormwater Mitigation Plan

The Standard Urban Stormwater Mitigation Plan is part of the Development Planning Program of the NPDES, Phase I, Stormwater Permit for the County of Los Angeles. The Standard Urban Stormwater Mitigation Plan (SUSMP) applies to development and redevelopment projects within the County that fall within specific categories. The County of Los Angeles has developed a SUSMP Manual that includes the permitting and inspection process for projects required to meet SUSMP regulations. The objective of the SUSMP is to effectively prohibit non-storm water discharges and reduce the discharge of pollutants from storm water conveyance systems to the maximum extent practicable statutory standards. The SUSMP defines hydrology standards for designing volumetric and flow rate-based Best Management Practices.

2012 Los Angeles County NPDES Permit

Effective on December 28, 2012, the Los Angeles RWQCB adopted Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges Within the Coastal Watersheds of Los Angeles County. The permit establishes new performance criteria for new development and redevelopment projects in the coastal zone.

County of Los Angeles Flood Control Act

The State legislature adopted the County of Los Angeles Flood Control Act in 1915, after a disastrous flood took a heavy toll on lives and property. The Act established the Los Angeles County Flood Control District (LACFCD) and empowered it to provide flood protection, water conservation, recreation, and aesthetic enhancement within its boundaries. In August 2000, the Watershed Management Division of the Los Angeles County Department of Public Works became the planning and policy arm of the Flood Control District. Overall the District encompasses more than 3,000 square miles, 85 cities, and approximately 2.1 million land parcels. It includes a vast majority of drainage infrastructure within incorporated and unincorporated areas in every watershed, including 500 miles of open channels, 2,800 miles of underground storm drains, and an estimated 120,000 catch basins.

The LACFCD regulates hydrologic and hydraulic design within its boundaries through its 1982 Hydraulic Design Manual and its 2006 Hydrology Manual. In conjunction with the Watershed Management Strategic Plan, the County Public Works Department provides criteria and planning procedures for flood plains, waterways, channels, and closed conduits within Los Angeles County. The Department promulgates the standard for project design through its "Standard Urban Stormwater Mitigation Plan" or SUSMP. This is the vehicle used to determine compliance with the California State EPA Stormwater Program for stormwater discharges.

City of Hermosa Beach

As a result of the 2012 RWQCB Order No. R4-2012-0175, the City of Hermosa Beach has drafted the City of Hermosa Beach Storm Water Management and Pollution Control Ordinance. The City is a co-permittee under RWQCB Order No. R4-2012-0175. As a co-permittee, the City is required to maintain adequate legal authority within its respective jurisdiction to control pollutant discharges and to require the use of control measures to prevent or reduce the discharge of pollutants into the MS4, to achieve water quality standards.

The City is currently drafting a Low Impact Development (LID) ordinance that establishes new storm water BMPs performance criteria for new development and redevelopment projects. LID BMPs would focus on reducing peak runoff by allowing rainwater to soak into the ground, evaporate into the air, or collect in storage receptacles for irrigation or other beneficial uses.

The City of Hermosa Beach is currently the owner of the portion of the Project Site at 555 6th Street and the City Maintenance Yard relocation site at 552 – 11th Place/1315 Valley Drive. The Community Development Department is charged with the administration of the ordinances and policies relating to land use and development within the City, along with enforcing building standards for the purpose of safeguarding public health and safety. In addition, the City Public Works Department has responsibility for some of the flood control measures in the region and regulates engineering standards and issues permits for all new grading and construction.

4.9.3 Significance Criteria

As defined in CEQA Appendix G, the Environmental Checklist Form, hydrology and water resource impacts would be significant if the Proposed Project would:

1. Violate any water quality standards or waste discharge requirements;
2. Results in a discharge of pollutants into an "impaired" water body that has been designated as such by the State Water Resources Control Board or the Los Angeles Regional Water Quality Control Board, under Section 303(d) of the Federal Water Pollution Prevention and Control Act (i.e., Clean Water Act);
3. Results in a discharge of "pollutants of concern" (i.e., pesticides, herbicides, PCBs, oil, grease, solvents, lead, copper, zinc, cadmium, plant debris, animal and yard waste) to a receiving water body, as identified by the Los Angeles Regional Water Quality Control Board;
4. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the groundwater table level, ultimately affecting the production rate of existing nearby wells;
5. 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 offsite;
6. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or substantially increase the rate of runoff in a manner that would result in flooding on or offsite;
7. Create, contribute, or alter hydrologic characteristics of the area producing runoff that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
8. Otherwise substantially degrade water quality;
9. Place structures within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or flood hazard delineation;
10. Place structures that would impede or redirect flood flows within a 100-year flood hazard area;
11. 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
12. Cause an inundation by a seiche, tsunami, or mudflow.

4.9.4 Project Impacts and Mitigation Measures

4.9.4.1 Introduction

Construction activities associated with Phases 1 and 3 of the Proposed Oil Project, the Proposed Pipelines, and the Proposed City Maintenance Yard Project could discharge pollutants that violate water quality standards or waste discharge requirements, result in a discharge of pollutants into an "impaired" water body, or result in a discharge of "pollutants of concern". Proposed Phases 2 and 4 drilling, oil processing, and oil transport operations could result in oil spills due to geologic hazards, mechanical failure, structural failure, corrosion, or human error. See Section 4.8, Risk of Upset, regarding potential crude oil spill scenarios.

4.9.4.2 Proposed Project Design Features

Contaminated Soil

Phase 3 would include implementation of a Remedial Action Plan to address the known contaminated soil and groundwater beneath the former landfill. Approximately 9,000 cubic yards of lead contaminated soil would be removed from the Project Site and hauled to an offsite Class I landfill, i.e., Kettleman Hills Facility. The petroleum contaminated soil would be treated in-place via vapor extraction technology. See Section 4.7.3.2, Proposed Project Design Features, for further details pertaining to the Remedial Action Plan.

Stormwater Runoff

The Applicant prepared a preliminary SUSMP, to be implemented during Phases 2 and 4 of the Project. This plan, which is included in Appendix A, Project Description Design Data, was developed as part of the municipal storm water program to address storm water pollution from new development, as described in Section 4.9.2.3, Local Policies and Regulations. Potential Oil Spills

The tank area would be surrounded by a containment berm, sufficient in height to retain 110 percent of the volume of the largest tank, as well as any contingency for rainwater and other liquids. The Applicant prepared a preliminary Oil Spill Contingency Plan (OSCP), to be implemented during Phases 2 and 4 of the Project. This plan, which only provides the requirements that would be included in a site-specific OSCP, is included in Appendix A, Project Description Design Data. The plan would be prepared as a marine OSCP, as the Project meets the definition of a marine facility, since it would be considered to have the potential to impact marine waters based on the proximity of storm drains that lead to the ocean with respect to the western portion of the proposed offsite underground pipeline.

4.9.4.3 Applicant Prepared Studies

The Applicant prepared a Phase I Environmental Site Assessment (Brycon, LLC 2012a) to determine the potential for subsurface soil and groundwater contamination at the Project Site, followed by a Phase II Environmental Site Assessment (Brycon, LLC 2012b) to identify and (if present) delineate soil and groundwater contamination. Excavations in contaminated soil and/or groundwater could impact surface water quality. Based on the results of the Phase I and II Environmental Site Assessments, a Remedial Action Plan (Brycon, LLC 2012c) was prepared in association with the Proposed Oil Project. This plan was developed specifically to address areas of contaminated soil on the Project Site in the event that Phase 3, Final Design and Construction, would be implemented.

4.9.4.4 Impacts

The following environmental thresholds would result in no impacts, as discussed:

Groundwater Recharge or Level

Hydrology and water resource impacts would be significant if the Proposed Project would:

Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the groundwater table level, ultimately affecting the production rate of existing nearby wells.

The Project Sites are located along the western perimeter of the West Coast Basin, west of the West Coast Groundwater Barrier Project. Potable water supplies are not present beneath the Project Site and groundwater is not actively recharged west of the Barrier Project. Groundwater in the West Coast Basin, is primarily recharged from the West Coast Basin Barrier Project, east of the Project Sites. No subsurface structures are proposed as part of the Proposed Project that would interfere with the West Coast Basin Barrier Project recharge activities. Proposed production and wastewater injection wells would not impede recharge to the basin. The Project Sites are currently paved; therefore, proposed Project Sites paving would not decrease any passive recharge that might occur at the Sites.

There are no domestic water supply wells located in the vicinity of the Project Site. However, in the general area of the Project Site, there is at least one well that pumps water for onsite industrial water. During the drilling of the production and injection wells, 130,000 gallons of water per well is expected to be used, primarily for production of drilling mud, which would be circulated through the well bore (E&B Natural Resources 2012). Potable water is provided to the City by the California Water Service Company (Cal Water), which derives its water supply from a variety of sources throughout California. In order to offset the demand for potable water, the Proposed Oil Project would use recycled (i.e., reclaimed) water supplied from a recycled water system, operated by West Basin Municipal Water District (WBMWD). Recycled water provided by WBMWD is available from its 12-inch main located in Valley Drive. The Proposed Oil Project proposes to use recycled water for well drilling, landscaping, and any other acceptable application where permitted. The WBMWD provided a will-serve letter to the Applicant, which is a written verification of sufficient water supply, based on substantial evidence. As a result, no impacts would occur with respect to depletion of groundwater supplies, interference with groundwater recharge, or lowering of the groundwater table.

See Section 4.14, Water Resources, for further discussion regarding water supply and demand.

Drainage Patterns

Hydrology and water resource impacts would be significant if the Proposed Project would:

- 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 offsite;

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or substantially increase the rate of runoff in a manner that would result in flooding on or offsite; or
- Create, contribute, or alter hydrologic characteristics of the area producing runoff that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

The Project Site and most of the Proposed City Maintenance Yard Project Site are currently paved, excluding an embankment and small planter along the north side of the latter site. Because the two sites are currently paved and landscaping will be established on the Project Site, re-paving of these sites as a result of Proposed Project construction would not result in an increase in stormwater runoff compared to existing conditions. In addition, following construction, runoff at the Project Site would be eliminated as a result of the Proposed Oil Project. As indicated in the SUSMP (in Appendix A), during Phase 1 construction, the surface grade would be altered such that it drains toward a temporary retention basin, capable of containing 100-year flood volumes. Phase 1 would also include construction of an oil/gas drilling well cellar, approximately 8 feet wide by 40 feet long by 12 feet deep, which would collect runoff in the vicinity of the drill rig during Phase 2 drilling activities.

During Phase 2, after setup of the drill rig and associated equipment and storage tanks, three secondary containment areas would be provided by earthen berms with impervious liners. Drainage outside the well cellar and secondary containment berms would be directed towards a temporary detention basin, constructed in the southern portion of the Site. A storm drain system would be designed such that during Phases 2, all storm water within the perimeter fence or wall for a 100-year storm event, including storm water in the well cellar, secondary containment areas, and temporary retention basin, would be retained and pumped into the water processing system for injection into the oil reservoir. However, portions of the secondary containment water may be trucked offsite.

During Phase 3, the well cellar would be expanded to include two cellars, approximately 8 feet wide by 120 feet long by 12 feet deep and equipped with storm water management collection sumps and pumps to direct storm water to a drain sump for processing and injection into the oil-producing reservoir. Similarly, a storm drain system would be designed such that during Phase 4, all storm water within the perimeter fence or wall for a 100-year storm event, including storm water in the well cellars, secondary containment areas, and temporary retention basin, would be retained and pumped into the water processing system for injection into the oil reservoir. These design features would be in compliance with a soon to be completed LID ordinance currently being drafted by the City. Therefore, the Proposed Oil Project would not create, contribute, or alter hydrologic characteristics of the area producing runoff that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. Similarly, the relocation of the City Maintenance Yard would not alter hydrologic characteristics or have any effect on storm drainage systems.

100-year Flood Hazards, Levee or Dam Failures, Seiche, Tsunami, or Mudflows

Hydrology and water resource impacts would be significant if the Proposed Project would:

- Place structures within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or flood hazard delineation;
- Place structures that would impede or redirect flood flows within a 100-year flood hazard area;
- 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
- Cause an inundation by a seiche, tsunami, or mudflow.

The Project Site and Proposed City Maintenance Yard Project Site are located seven blocks uphill from the beach. The Official Tsunami Map of Los Angeles County (California Geological Survey 2013) indicates that the Proposed Project Sites are not located within the influence zone of a tsunami wave. There are no rivers or streams in the vicinity of the sites, nor are the sites within a flood hazard zone (Figure 4.9-1). As determined by FEMA, the sites are above the 500-year flood plain and are not in an area protected by levees or dams. Therefore, implementation of the Proposed Project would not place structures within a 100-year flood hazard area.

The storm water management plan for the Proposed Oil Project Site will be designed to contain a 100-year storm event, as previously described in the discussion under Drainage Patterns, above. The temporary, construction-related, onsite detention basin will be adequately sized to accommodate 100-year storm flows during Phase 1 of the Proposed Oil Project. During Phases 2 and 4, all Project Site runoff would be contained onsite as a result of construction of two well cellars, a temporary retention basin, and secondary containment areas, which would capture all precipitation. Consequently, there is unlikely to be any contribution to offsite runoff that might result in flooding. The Proposed Project Sites do not have potential risks associated with loss, injury, or death due to flooding or from potential failure of a levee or dam. In addition, there is no risk of seiche or mudflow at the Proposed Project Sites.

Impact HWQ.1 pertains to the following significance criteria:

Water quality impacts would be deemed significant if the Proposed Oil Project would:

- Violate any water quality standards or waste discharge requirements;
- Results in a discharge of pollutants into an “impaired” water body that has been designated as such by the State Water Resources Control Board or the Los Angeles Regional Water Quality Control Board, under Section 303(d) of the Federal Water Pollution Prevention and Control Act (i.e., Clean Water Act); or
- Results in a discharge of “pollutants of concern” (i.e., pesticides, herbicides, PCBs, oil, grease, solvents, lead, copper, zinc, cadmium, plant debris, animal and yard waste) to a receiving water body, as identified by the Los Angeles Regional Water Quality Control Board.

Impact #	Impact Description	Phase	Residual Impact
HWQ.1	New grading, construction, and soil remediation could degrade surface water quality	Phase 1and 3	Class III Less Than Significant

Grading and construction at the Project Site, at the Proposed City Maintenance Yard Project Site, and along the pipeline corridors could result in degradation of surface runoff entering the storm drain system and emptying into nearby Santa Monica Bay, which is listed on the Clean Water Act Section 303 (d) list as an "impaired water body" for contact recreation. Potential construction related contaminants include solid and sanitary wastes, phosphorous, nitrogen, oil and grease, concrete washout, construction chemicals, and construction debris.

Project Site

Soils in the northeast portion of the Project Site, in the vicinity of a former landfill, have been impacted with petroleum hydrocarbons, lead, and other metals. Groundwater has similarly been impacted as a result of the soil contamination. Other contaminants may be present in Project Site soils as a result of City maintenance activities or other prior onsite activities (Brycon, LLC 2012a, 2012b). Therefore, excavation and construction at the Project Site could encounter contaminated soils, which could be mobilized such that surface runoff is adversely affected. As indicated in Section 4.9.4.2, Proposed Project Design Features, Phase 3 would include implementation of a Remedial Action Plan (Brycon, LLC 2012c) to address the known contaminated soil and groundwater beneath the former landfill. Approximately 9,000 cubic yards of lead contaminated soil would be removed from the Project Site and hauled to an offsite Class I landfill, i.e., Kettleman Hills Facility. The petroleum contaminated soil would be treated in-place via vapor extraction technology.

Remediation of onsite soil and groundwater contamination would result in long-term *beneficial* impacts to groundwater quality; however, remediation activities could result in adverse short-term impacts to surface water quality. Soil remediation activities and/or offsite disposal of contaminated soil could also result in incidental spills of petroleum products from excavation and grading equipment and/or exposure of improperly covered/contained contaminated soils to rainfall, resulting in contaminated runoff. However, the following standard conditions of approval would be implemented to mitigate these impacts, resulting in less than significant impacts.

Prior to initiation of construction activities, the Applicant would develop a site-specific Storm Water Pollution Prevention Plan (SWPPP), approved in accordance with the State General Construction Permit and the MS4 Discharges within the Coastal Watersheds of Los Angeles County, Los Angeles Regional Water Quality Control Board Order No. R4-2012-0175, and the City of Hermosa Beach Storm Water Management and Pollution Control Ordinance. The SWPPP would be developed by qualified Storm Water Pollution Prevention Plan Developer (QSD). A Qualified Storm water Pollution Prevention Plan Practitioner (QSP) would oversee and monitor the implementation of this plan. The SWPPP would include, but not be limited to:

- As part of the structural Best Management Practices (BMPs), filtering elements such as silt fences, straw wattles, and absorbent materials would be used together with filter technology to catch sediment, debris, oil and pollutants;
- Use of auto shredder fluff for alternative daily cover;
- During construction, washing of concrete trucks, paint, equipment, or similar activities shall occur only in areas where polluted water and materials can be contained and filtered through structural BMPs. The location(s) of the washout areas(s) would be clearly noted at the site with signs;
- Implement BMPs to reduce tracking sediment offsite, including use of a stabilized construction entrance/exit with steel shakers, as well as use of tire wash areas;
- Construction materials and waste, such as paint, concrete slurry, fuels, etc. would be stored, handled, and disposed of in a manner that minimizes the potential for storm water contamination. A hazardous materials storage and use plan would be maintained onsite, to include bermed and lined hazardous materials storage areas that are covered during the rainy season; and maintenance of hazardous materials spill cleanup equipment (e.g.; sorbent pads, shovels, and bags for containment of contaminated soil). All workers would be trained in location and use of cleanup equipment; and
- Stormwater monitoring would be completed by an independent, third party consultant, in accordance with requirements of the Los Angeles Regional Water Quality Control Board. Stormwater runoff monitoring protocol would include establishment of pre-drilling, baseline surface water quality conditions; establishment of a RWQCB-approved constituent list, including associated detection limits, maximum allowable concentration; and a subsequent sampling schedule. The storm water analysis would demonstrate that the water is free of all petroleum hydrocarbon contaminants, including total petroleum hydrocarbons (TPH); benzene, toluene, ethyl-benzene, and total xylenes (BTEX); and polychlorinated biphenyls (PCBs); and is within allowable Basin Plan and EPA benchmark parameters for general minerals, before being discharged to surface waters of the State.

Proposed City Maintenance Yard Project Site

Similar to the Project Site, demolition, grading, and construction could result in degradation of surface runoff entering the storm drain system and emptying into nearby Santa Monica Bay. Incidental spills of petroleum products from construction equipment or leaching of potentially contaminated soil encountered during excavations could adversely impact surface water quality. However, construction would be completed in accordance with a standard SWPPP, as described above, such that impacts would be *less than significant*.

Proposed Pipelines

Similar to the Project Site, excavations, temporary stockpiling of soil, pipeline construction, and trench backfill and compaction could result in degradation of surface runoff entering the storm drain system and emptying into nearby Santa Monica Bay. Incidental spills of petroleum products from construction equipment or leaching of potentially contaminated soil encountered during excavations could adversely impact surface water quality. However, construction would be completed in accordance with a standard SWPPP, as described above, such that impacts would be *less than significant*.

Also see Section 4.7, Geological Resources, regarding potential water quality impacts related to erosion.

Mitigation Measures
Mitigation measures would not be required in the absence of significant impacts.

Impact HWQ.2 pertains to the following significance criteria:

Water quality impacts would be deemed significant if the Proposed Oil Project would:

- Violate any water quality standards or waste discharge requirements;
- Results in a discharge of pollutants into an "impaired" water body that has been designated as such by the State Water Resources Control Board or the Los Angeles Regional Water Quality Control Board, under Section 303(d) of the Federal Water Pollution Prevention and Control Act (i.e., Clean Water Act); or
- Results in a discharge of "pollutants of concern" (i.e., pesticides, herbicides, PCBs, oil, grease, solvents, lead, copper, zinc, cadmium, plant debris, animal and yard waste) to a receiving water body, as identified by the Los Angeles Regional Water Quality Control Board.

Impact #	Impact Description	Phase	Residual Impact
HWQ.2	A rupture or leak during oil drilling operations, from pipelines, or from other infrastructure could substantially degrade surface water and groundwater quality	Phase 2 and 4	Class I Significant and Unavoidable

Up to 30 oil/gas wells and four wastewater injection wells would be drilled at the Proposed Project Site, from two separate well cellars. The produced oil and gas would be separated into gas, oil, and water streams. The oil would be processed to remove any remaining water and then the dry oil would be temporarily stored in tanks and shipped via pipeline or trucks to local Los Angeles area refineries (during Phase 2) or transported by pipeline (Phase 4). The produced water would be conveyed to onsite injection wells, where the water would be injected back into the producing formation.

Proposed drilling, oil processing, and oil transport operations could result in oil spills due to geologic hazards, mechanical failure, structural failure, corrosion, or human error during any of the steps outlined above. Among other geologic hazards, the Palos Verdes and Newport-Inglewood faults lie approximately two miles southwest and six miles northeast of the Project Site, respectively, at the closest point. Both of these faults are active and capable of producing severe seismically induced ground shaking at the Project Site (see Section 4.7, Geological Resources/Soils).

The most likely spills from the facility would involve crude oil and/or produced water. Such spills could potentially result in water quality impacts to shallow groundwater, nearby drainages, storm drain runoff, and the nearby Pacific Ocean. Small leaks or spills would be contained by the well cellars, secondary containment berms, a stormwater detention basin, and a storm drain system, which would be designed such that during Phases 2 and 4, all storm water within the

perimeter fence or wall would be retained and pumped into the water processing system for injection into the oil reservoir. This drainage system, which is illustrated in the SUSMP in Appendix A, would result in *beneficial* impacts with respect to existing conditions, as at least a portion of the incidental spills of petroleum products and hazardous materials at the existing Public Works facility flow offsite into storm drains and the nearby Pacific Ocean.

In contrast, large spills could spread to surface waters, groundwater, and ocean water and may substantially degrade water quality, with potential long-term impacts to beneficial water quality. As discussed in Section 4.8, Safety, Risk of Upset, and Hazards, Subsection Spill Risks of the Proposed Oil Project Site and Pipelines, in the event of an oil well blowout; wellhead failure; piping or equipment failure; containment berm failure as a result of severe seismically-induced ground shaking; and/or simultaneous failure of multiple vessels, all spilled liquids, including oil and produced water, would most likely be contained onsite and/or be an extremely low frequency event (less than one in a million). The facility would be designed so that all spills would be captured by berms and the facility drain system and directed into the crude oil/water processing system for disposal down the injection wells or recovered into the crude processing stream. Containment of all spilled liquids on site, in combination with failure of the containment berm, could potentially spill over into the street or adjacent properties, although the probability of such an occurrence is less than one in million.

A blowout during drilling at the facility, if the wells are pressurized, could send crude oil up into the air, which could cause impacts outside of the Project Site. However, the volumes of crude oil spilled offsite would most likely be a few barrels, as most crude oil would be retained onsite.

However, as also described in Section 4.8, large spills located outside of the facility could be produced from a pipeline rupture. No creeks are located in the vicinity of the Project Site, nor along the Proposed Pipeline route; however, the Pacific Ocean is located approximately 1,700 feet downhill from the Project Site and all storm drains in the Project Site vicinity and along the Pipeline route lead directly to the ocean. The volume of oil from a pipeline spill is a function of draindown volume and pumping volume. Draindown is the spill of crude oil that is in the pipeline and that drains down to the rupture location and into the environment by the force of gravity. A spill near Herondo Street and Valley Drive would most likely be directed into the storm drain system, which from that point drains about 1,500 feet through storm drain piping onto the beach, near the high tide line. The amount of oil that would enter the ocean would depend on how much sand was on the beach at that particular time. Although some of the more toxic components of oil, e.g., volatile organic compounds, would be dissipated rapidly due to aeration, i.e., volatilization, spills and associated contaminated stormwater runoff reaching the ocean could have significant and widespread impacts to marine water quality. Such impacts would be considered *significant*.

Similarly, spills could result in significant, long-term contamination of groundwater in dune and alluvial sediments beneath the spill site, if present, as these soils are generally unconsolidated and permeable. Although most of the Project Site and surrounding area would be paved and impermeable, pipeline spills could occur underground and/or spill into areas that might be unpaved and permeable. Although groundwater beneath the Project Site and the western portion of the proposed pipeline is not locally potable, the portion of the West Coast Basin underlain by the Project Site and proposed pipelines is still protected by the California RWQCB as a

beneficial water source with respect to municipal and domestic supply, industrial service supply, industrial process supply, and agricultural supply. In addition, petroleum impacted groundwater could migrate through the subsurface to nearby marine waters, resulting in degradation of marine water quality and violations of water quality standards. Therefore, impacts would be considered *significant*.

With respect to potential offshore water quality impacts, the Proposed Oil Project would utilize directional drilling techniques to access oil and gas reserves in offshore areas. As illustrated in Figure 2-8, the targeted oil and gas reserves are located approximately 2,000 to 3,000 feet beneath the seafloor. The current geologic mechanism that is creating a trap for oil accumulation within the Upper Main, Lower Main, Del Amo, and Schist Conglomerate zones of the Puente Formation prevents upward migration of oil and gas into overlying marine waters. The oil wells would be designed to meet all of the rules and regulations of the California DOGGR. As illustrated in Figure 2-10, all of the wells would have steel casing that would be cemented in place, thus preventing migration of oil, gas, and drilling fluids outside the well bore. In addition, DOGGR requires periodic testing to determine if fluids are confined, and mandates corrective measures, followed by re-testing if this fluid is not confined.

The Applicant has indicated that no high volume/high pressure fracking, i.e., hydraulic fracturing, would occur during oil and gas production activities, thus minimizing inadvertent migration of crude oil and/or drilling fluids above the producing geologic formations. See Impact WR.3 of Section 4.14, Water Resources, regarding potential water quality impacts related to wastewater injection.

According to Section 4.8, Safety, Risk of Upset, and Hazards section, under worst-case conditions, maximum estimated spill volumes at the Project Site would be from a catastrophic failure of one of the oil shipping tanks to be constructed during Phase 3, which would have a capacity of 2,900 barrels. The tank area would be surrounded by a containment berm, sufficient in height to retain at least 110 percent of the volume of the largest tank, as well as any contingency for rainwater and other liquids.

A worst-case scenario for pipeline rupture would be a rupture at the tie-in at the Exxon Mobil Refinery, which could result in a spill of almost 17,000 gallons. A release from the pipeline between the Project Site and Prospect Avenue, near the corner of Herondo Street and Valley Drive, could produce a spill of 16,000 gallons that could drain directly into subsurface soils and/or to the ocean through storm drains. These impacts would be considered significant.

Mitigation Measures

HWQ-2a The Applicant shall properly maintain the associated crude oil pipelines, storage tanks, and processing facilities within and outside the Project Site, including smart-pigging according to State of California Office of the State Fire Marshal requirements and the standards outlined by the Department of Oil, Gas and Geothermal Resources, and the Los Angeles Regional Water Quality Control Board. The Applicant shall visually inspect onsite storage tanks and processing equipment at least daily and provide a visual inspection of the crude oil pipeline right-of-way on a weekly basis.

HWQ-2b The Applicant shall install a leak detection system for crude pipelines to the selected valve box location. The system shall include pressure and flow meters, flow balancing, supervisor control and data acquisition system, and a computer alarm system in the event of a suspected leak. Temperature, pressure, and flow shall be monitored at each pipeline entry and exit. If any variable deviates by more than 10 percent of the normal operating range, the system shall trigger both audible and visual alarms. Flow balancing shall be conducted every 15 minutes, 1 hour, 24 hours, and 48 hours with the accuracy defined once the system is established and tested.

HWQ-2c Personnel at the site shall be trained in equipment use and containment and cleanup of an oil spill. Dry cleanup methods, such as absorbents, shall be used on paved and impermeable surfaces and shall be included in a spill trailer maintained onsite. Spills in dirt areas shall be immediately contained with an earthen dike and the contaminated soil shall be dug up and discarded in accordance with local and state regulations.

HWQ-2d Oil spills shall be contained and cleaned according to measures outlined in the then-current California Stormwater Quality Association Best Management Practice Handbook.

HWQ-2e A United States Environmental Protection Agency, Spill Prevention, Control, and Countermeasure Plan, approved by the City of Hermosa Beach Fire Department, shall be implemented in the event of a spill. The Plan, which shall include a spill response trailer, equipment, and personnel training, shall be completed prior to Phase 2 and Phase 4, and in compliance with the California State Oil Spill Contingency Plan (California Department of Fish and Game, Office of Spill Prevention and Response 2010) and the Los Angeles/Long Beach Oil Spill Contingency Plan (California Department of Fish and Wildlife 2011). Spill cleanup shall be completed under the oversight of the lead regulatory agency, with respect to oil spills, as identified in the Spill Prevention, Control, and Countermeasure Plan.

HWQ-2f The well cellars shall be lined with an impermeable membrane to prevent oil-based substances from seeping into groundwater supplies. All drilling muds storage shall be contained within Baker-type enclosed tanks, which shall be sized to accommodate high intensity rainfall events without overtopping.

HWQ-2g The Applicant shall install a check valve in the crude oil pipeline at the Herondo and Valley drive intersection, where the crude oil pipeline turns eastward and starts uphill.

HWQ-2h The Applicant shall fund and install, under the direction of the Hermosa Beach Public Works Department, an oil/grit separators or oil/water separator located along Herondo Street, downstream of Valley Drive, in order to capture small to medium sized spills before they reach the ocean. Installation and maintenance costs shall be provided by the Applicant and the devices shall be inspected by the Applicant to ensure that the "trap" is operational before any storm events.

HWQ-2i The Applicant shall utilize a smaller 6" ERW pipe and a heat and impact resistant coating at a minimum comparable to a 3-layer fusion bonded epoxy (such as

BrederoShaw 3LPP) and weld coverings equivalent to sleeves with epoxy primer. Specification of the pipe and coating shall approved by the City.

HWQ-2j The Applicant shall install a 3 sack slurry starting 6 inches above the pipe to the base of the pavement or ground surface and lay strips of warning tape over the top to prevent third-party damage.

Residual Impacts

Inspection and maintenance programs can effectively reduce the frequency of release events in industry. The implementation of plans, training and the ready availability of spill control equipment would help to reduce the potential impacts of a crude oil spill.

The installation of a check valve into the crude oil pipeline at Herondo Street would reduce the potential spill volumes from a spill at that point by about 1,250 gallons by eliminating the draindown of the pipeline from the segment from Herondo Street to Prospect Avenue.

The installation of an oil separator, or a "Water Quality Inlet (WQI)" (EPA 1999), consist of a series of chambers that promote sedimentation of coarse materials and separation of free oil (as opposed to emulsified or dissolved oil) from storm water. Most WQIs also contain screens to help retain larger or floating debris, and many of the newer designs also include a coalescing unit that helps to promote oil/water separation. The system may need to be specially designed for the level of water flows that are generated along Herondo.

The implementation of the best pipe construction and coating techniques available would primarily reduce failures related to corrosion and construction/manufacturing. The CSFM data provides a breakdown of failure rates by construction and coating type. Although this information is older, the substantial reductions associated with the use of electrical resistance welding (ERW) techniques of construction and the use of advanced coating techniques would still be applicable. The use of ERW pipe from CSI in Fontana and a top-of-the line coating provided by BrederoShaw Company would produce substantial reduction in failure rates. Coatings using multi-layers, including a first layer of fusion bonded epoxy with subsequent layers of polypropylene to protect the epoxy from water uptake and long-term breakdown, would reportedly provide the best assurances against long term corrosion and construction related damage (conversation with Mr. Pierce, BrederoShaw 5/16/2014). Note that the use of these measures would not affect the third party causes, equipment malfunctions or weather/natural/earthquake force damage.

The installation of cement above the pipeline would reduce the number of third party impacts as a third party would have to pass through the cement and the warning tape in order to produce a third-party failure. The resulting failure frequencies, with the pipe, coatings and cement covering, would be reduced on the order of 70-80%. Failure rates and probabilities along the Valley Drive and Herondo Street to Prospect Avenue stretch with these mitigations are shown in Table 4.9-1 below.

Table 4.9-1 Pipeline Spill Frequencies and Rain Events: Herondo Area Only MITIGATED

		Rain Event, inches per 24 hours			
		0.01	0.10	0.50	1.00
Annual Average Number of Days -->	**Anytime**	**34**	**22**	**9**	**4**
Annual Probability	-	-	-	-	-
Rupture	$1.8X10^{-4}$	$1.7X10^{-5}$	$1.1X10^{-5}$	$4.5X10^{-6}$	$2.0X10^{-6}$
Leak	$8.3X10^{-4}$	$7.7X10^{-5}$	$5.0X10^{-5}$	$2.0X10^{-5}$	$9.1X10^{-6}$
Project Life Probability					
Rupture	0.6%	0.059%	0.038%	0.016%	0.007%
Leak	2.8%	0.270%	0.175%	0.071%	0.032%
Combined Probability (leaks and ruptures)	3.4%	0.329%	0.213%	0.087%	0.039%

Notes: Rain data from Western Regional Climate Data webpage http://www.wrcc.dri.edu/, Station:(048973) Torrance, period of 1932-2012.

The probability of a spill during a 0.50 inch rain event would be reduced from 0.40% to 0.087% over the Project lifetime (see section 4.8, Safety and Risk).

It is important to note that the use of a double walled pipe was examined and was addressed by the CSFM in the past (CSFM Bulletin 1998). The CSFM has concerns about the use of double walled pipes, and longer term impacts could increase, as reported by the CSFM (communication with Mr. Flores and Mr. Gorham, 5/15/2014) due to long term problems with cathodic protection, incorporation of valves, construction of bends, failures of the outer wall, and thermal stress. The bulletin stated that "The design, construction, operation and maintenance difficulties listed above serve as some examples of how the proposed installation of double-wall pipeline is contrary to established law, regulation and established engineering principles and could compromise public and environmental safety" and that "double-wall construction adds significant operator costs for design, construction, operation and maintenance while increasing the risk to the public and the environment." While these concerns could be partially addressed by the use of a non-metallic outer pipe on a portion of the route, the CSFM staff indicated that they do not recommend a double walled pipe and would actually not allow it to be built. The preferred approach is to use the best pipe construction and coating techniques available (as discussed above).

Note also that periods of the project, particularly during Phase 2, crude oil would be transported by truck. The potential for a truck accident and subsequent spill would also introduce the potential for impacts during this phase of the project.

The use of the 6 inch pipe instead of an 8 inch pipe would reduce the spill volumes, and with the check valve mitigation at Herondo Street, preventing drain down from Prospect Avenue, the volume would be reduced by about 700 gallons.

Although these measures would reduce potential water quality impacts associated with a large spills, the residual impacts to water quality would remain **significant and unavoidable (Class I)**, based on the severity of impacts.

Oil Seeps

Natural oil seeps are present in Santa Monica Bay, with seep estimates ranging from 100 to 1,000 metric tons per year for the entire bay and 500 metric tons per year for the Manhattan Beach and Redondo Beach seeps, combined. Several investigations have inferred that withdrawal of oil from the reservoirs near Platform Holly near Santa Barbara (about two miles southwest of Coal Oil Point) is responsible for decreases in seep activity by more than 50 percent over a 22 year period. Therefore, it is possible that oil production associated with the Proposed Project could decrease oil seeps in Santa Monica Bay. The geologic conditions associated with the oil seeps near Coal Oil Point and Platform Holly are unique to California. Based on various estimates, natural seepage rates at Coal Oil Point are estimated to be up to 190 barrels of oil per day, or 7,800 to 8,900 metric tons per year, which is substantially more than all seepage in Santa Monica Bay. The seeps at Coal Oil Point emanate from the fractured Monterey Shale, which is exposed at the sea floor surface. Platform Holly oil production from the Monterey Shale may have caused a decline in reservoir pressure, thus removing the primary driving mechanism of seepage from Monterey Formation fractures on the seafloor. In contrast, the offshore Manhattan Beach and Redondo Beach seeps occur along the surface trace of the offshore Palos Verdes Fault. As illustrated in Figure 2.8, Proposed Project oil production would occur from the Puente Formation, which is not exposed at the seafloor surface. However, oil from the target oil producing horizons migrates laterally toward the offshore 103 Fault and nearby Palos Verdes Fault, at which point the Palos Verdes Fault may act as a conduit for vertical migration of oil to the surface. Therefore, it is possible but somewhat speculative, similar to the Ellwood Field at Coal Oil Point, that a decrease in reservoir pressure could potentially decrease oil seeps from the Manhattan Beach and Redondo Beach seeps.

4.9.5 Other Issue Area Mitigation Measure Impacts

Some mitigation measures could increase construction requirements associated with the Proposed Project, which could increase construction-related potential for storm water discharges or activity discharges. However, mitigation measures would effectively reduce the potential for discharges. Therefore, the mitigation measures would not result in additional impacts, and additional analysis or mitigation is not required.

4.9.6 Cumulative Impacts and Mitigation Measures

The region of influence for surface water quality-related impacts would be limited to those cumulative projects located within the same watershed. Since the Proposed Project Sites are located on old dune topography, the top of the local watershed that encompasses the Proposed Project Sites extends approximately one mile to the east. In general, with implementation of mitigation measures, impacts due to the Proposed Project can be mitigated to less than significant levels. However, because of the severity of impacts associated with the increased potential for an accidental oil spill, the Proposed Project would be a potentially significant adverse contribution to cumulative water quality impacts.

4.9.7 Mitigation Monitoring Plan

Mitigation Measure	Requirements	Compliance Verification		
		Method	Timing	Responsible Party
HWQ-2a	The Applicant shall properly maintain the associated crude oil pipelines, storage tanks, and processing facilities within and outside the Project Site, including smart-pigging according to State of California Office of the State Fire Marshal requirements and the standards outlined by the Department of Oil, Gas and Geothermal Resources, and the Los Angeles Regional Water Quality Control Board. The Applicant shall inspect storage tank and processing equipment at least daily and pipeline inspections on a weekly basis.	Review of maintenance reports	Before Phase 4 operations Annually	Cities of Hermosa Beach, Redondo Beach, and Torrance
HWQ-2b	The Applicant shall install a leak detection system for crude pipelines to the Exxon Mobil Refinery. The system shall include pressure and flow meters, flow balancing, supervisor control and data acquisition system, and a computer alarm system in the event of a suspected leak. Temperature, pressure, and flow shall be monitored at each pipeline entry and exit. If any variable deviates by more than 10 percent of the normal operating range, the system shall trigger both audible and visual alarms. Flow balancing shall be conducted every 5 minutes, 1 hour, 24 hours, and 48 hours with the accuracy defined once the system is established and tested.	Review of system design and testing results	Before Phase 4 operations	Cities of Hermosa Beach, Redondo Beach, and Torrance
HWQ-2c	Personnel at the site shall be trained in equipment use and containment and cleanup of an oil spill. Dry cleanup methods, such as absorbents, shall be used on paved and impermeable surfaces and shall be included in a spill trailer maintained onsite. Spills in dirt areas shall be immediately contained with an earthen dike and the contaminated soil shall be dug up and discarded in accordance with local and state regulations.	Review of training and equipment	Before Phase 2 and Phase 4 operations, and intermittently thereafter	Cities of Hermosa Beach, Redondo Beach, and Torrance

Mitigation Measure	Requirements	Compliance Verification		
		Method	Timing	Responsible Party
HWQ-2d	Oil spills shall be contained and cleaned according to measures outlined in the then-current California Stormwater Quality Association Best Management Practice Handbook.	Review of training and incident reports	Before Phase 2 and Phase 4 operations, and intermittently thereafter	Cities of Hermosa Beach, Redondo Beach, and Torrance
HWQ-2e	A United States Environmental Protection Agency, Spill Prevention, Control, and Countermeasure Plan, approved by the City of Hermosa Beach Fire Department, shall be implemented in the event of a spill. The Plan, which shall include a spill response trailer, equipment, and personnel training, shall be completed prior to Phase 2 and Phase 4, and in compliance with the California State Oil Spill Contingency Plan (California Department of Fish and Game, Office of Spill Prevention and Response 2010) and the Los Angeles/Long Beach Oil Spill Contingency Plan (California Department of Fish and Wildlife 2011). Spill cleanup shall be completed under the oversight of the lead regulatory agency, with respect to oil spills, as identified in the Spill Prevention, Control, and Countermeasure Plan.	Review of reports	Before Phase 2 and Phase 4 operations	Cities of Hermosa Beach, Redondo Beach, and Torrance
HWQ-2f	The well cellars shall be lined with an impermeable membrane to prevent oil-based substances from seeping into groundwater supplies. All drilling muds storage shall be contained within Baker-type enclosed tanks, which shall be sized to accommodate high intensity rainfall events without overtopping.	Review of design documents, field inspection	Before Phase 2 and Phase 4 operations	Cities of Hermosa Beach, Redondo Beach, and Torrance
HWQ-2g	The Applicant shall install a check valve in the crude oil pipeline at the Herondo and Valley drive intersection, where the crude oil pipeline turns eastward and starts uphill.	Review of design documents, field inspection	Before Phase 4 operations	Cities of Hermosa Beach, Redondo Beach, and Torrance
HWQ-2h	The Applicant shall fund and install, under the direction of the Hermosa Beach Public Works Department, an oil/grit separators or oil/water separator located along Herondo Street, downstream of Valley Drive, in	Review of design documents, field inspection	Before Phase 4 operations, and intermittently	Cities of Hermosa Beach, Redondo Beach, and

Mitigation Measure	Requirements	Compliance Verification		
		Method	Timing	Responsible Party
	order to capture small to medium sized spills before they reach the ocean. Installation and maintenance costs shall be provided by the Applicant and the devices shall be inspected by the Applicant to ensure that the "trap" is operational before any storm events.		thereafter	Torrance
HWQ-2i	The Applicant shall utilize a smaller 6" ERW pipe and a heat and impact resistant coating at a minimum comparable to a 3-layer fusion bonded epoxy (such as BrederoShaw 3LPP) and weld coverings equivalent to sleeves with epoxy primer. Specification of the pipe and coating shall approved by the City.	Review of design documents, field inspection	Before Phase 4 operations	City of Hermosa Beach, CSFM
HWQ-2j	The Applicant shall install a 3 sack slurry starting 6 inches above the pipe to the base of the pavement or ground surface and lay strips of warning tape over the top to prevent third-party damage.	Review of design documents, field inspection	Before Phase 4 operations	City of Hermosa Beach